THE ECONOMICS OF DEVELOPMENT AND PLANNING

M.L. JHINGAN

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THE ECONOMICS OF DEVELOPMENT AND PLANNING

40TH REVISED AND ENLARGED EDITION

M.L. JHINGAN

Retired Deputy Director,
Higher Education, Haryana

SIMPLY THE TEXT !

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PREFACE TO THE 40th EDITION

It is gratifying that this popular text book has been patronized by both teachers and students in India and abroad for more than four decades ever since it was first published in 1966.

The present edition has been substantially revised, rearranged and presented in a new format with new diagrams. The text contains some significant alterations and additions in a number of chapters.

Rewrite of Chapters:

The Malthusian Theory
Mill's Theory
The Classical Theory
The Marxian Theory
The Jorgenson Model
The Models of Technical change.

New Chapters:

Economic Integration among Developing Countries
WTO and Developing Countries
Millennium Development Goals (MDGs).

I hope the present edition will be of immense help to candidates preparing for M.A., N.E.T., I.E.S., Civil Services and other related examinations.

Suggestions to improve the book are solicited.

M.L. JHINGAN

PREFACE TO THE FIRST EDITON

This book examines the problems of economic development of underdeveloped countries. There is, however, no dearth of literature on the subject. But it is scattered in journals, reports and doctoral theses. Some of the books on the subject deal with particular aspects of the problems of underdevelopment, while others are in the form of lectures delivered by eminent economists from time to time. There are very few books written in the textbook style. But they are mostly occidental in nature. In certain cases, their appoach and presentation is abstract and difficult. I have endeavoured to present the subject in a lucid and intelligible manner as possible as in oriental setting.

The book is intended to meet the requirements of M.A. and Honours students preparing for the paper on *Economics of Development and Planning*. It will also prove useful to the candidates for the various competitive examinations. The syllabi of all the Indian Universities and those of the Universities of Leeds, Manchester and London have been consulted for this purpose.

I have drawn heavily on the writings of a vast galaxy of economists who have done much to enrich the subject matter of economic development within the last two decades. However, no amount of footnoting can ever repay the debt I owe to them.

My interest in the subject was aroused when I was a student of the University of Delhi. I had the opportunity to listen to a series of lectures delivered by Dr J.B. Condliffe of the University of California and Mr Maurice Dobb of the University of Cambridge as Visiting Professors.*

I imbibed further interest from the classroom lectures of Professors V.K.R.V. Rao, B.N. Ganguli and Raj Krishna on the different aspects of the subject though it was in its nascent state at that time. I wish to recall my indebtedness to all of them.

I beg to acknowledge my sincere gratitude to the following publishers from

whose publications I have borrowed copyright material: George Allen & Unwin Ltd., London; Prentice-Hall, New Jersey, USA; Oxford University Press, New York & London; Macmillan & Co., The Free Press; Yale University Press; Routledge and Kegan Paul, London; John Wiley & Sons, Inc. N.Y.; Orient Longmans; Cambridge Universiy Press; Asia Publishing House, Bombay; Kitabistan, Allahabad; Central Book Depot, Allahabad; Allied Publishers, Bombay; and to many others.

No word of gratitude is sufficient to appreciate the encouragement I have been receiving from time to time from my revered teachers, Mr K.N. Bhattaharya, Professor of Economics, National Academy of Administration, Government of India, Mussoorie and Mr. N.K. Pant, Associate Director in Economics, School of Correspondence Courses, University of Delhi. Without their help, this book could not have been possible. Needless to say, I alone am responsible for any errors which may remain.

M.L. JHINGAN

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* J.B. Condliffe, *Technological Progress and Economic Development; M. Dobb, Some Aspects of Economic Development*, Delhi 1951.

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Introduction

PART I
INTRODUCTION

CHAPTER

Economics of Development : Concepts and Approaches

INTRODUCTION

The Economics of Development refers to the problems of the economic development of underdeveloped countries. Though the study of economic development has attracted the attention of economists right from Adam Smith down to Marx and Keynes, yet they were mainly interested in the problems which were essentially static in nature and largely related to a Western European framework of social and cultural institutions. It is, however, in the forties of the 20th century and especially after the Second World War that economists started devoting their attention towards analyzing the problems of underdeveloped countries and formulating theories and models of development and growth. Their interest in the economics of development has been further stimulated by the wave of political resurgence that swept the Asian and African nations as they threw off the colonial yoke after the Second World War. The desire on the part of new leaders in these countries to promote rapid economic development coupled with the realisation on the part of the developed nations that 'poverty anywhere is a threat to prosperity everywhere,' has aroused further interest in the subject.

But the interest of the wealthy nations in removing widespread poverty of the underdeveloped countries has not been aroused by any humanitarian motive. The most cogent reason for aiding the underdeveloped countries had been the cold war between Russia and the West before the collapse of the Soviet Union, each trying to enlist the support and loyalty of underdeveloped countries by promoting larger aid than the other.

Economic development has also an export value for both the aid-giving and aid-receiving countries. In order to avoid secular stagnation, rich countries need an ever-increasing rate of development which must be accompanied by an outlet for the use of their growing capital stock. Poor countries need an accelerating rate of development to increase their export potential for avoiding deficit in balance of payments.

However, a study of the *Poverty of Nations* and the methods of removing poverty cannot be based on the experience of the rich nations. For 'in the advanced countries there has been a tendency to take economic development for granted as something that takes care of itself and to concentrate on the short-term oscillations of the economy".[1] Therefore, Myrdal says that the underdeveloped countries should not accept our inherited economic theory uncritically but remould it to fit their own problems and interests.[2]

ECONOMIC DEVELOPMENT AND ECONOMIC GROWTH

Generally speaking, economic development refers to the problems of underdeveloped countries and economic growth to those of developed countries. Maddison makes the distinction between the two terms in this sense when he writes: "The raising of income levels is generally called economic growth in rich countries and in poor ones it is called economic developinerit:[3] But this view does not specify the underlying forces which raise the income levels in the two types of economies. Mrs. Hicks points out in this connection that the problems of underdeveloped countries are concerned with the development of unused resources, even though their uses are well-known, while those of advanced countries are related to growth, most of their resources being already known and developed to a considerable extent.[4]

In fact, the terms 'development' and 'growth' have nothing to do with the type

of economy. The distinction between the two relates to the nature and causes of change. Schumpeter makes the distinction clearer when he defined development," as a discontinuous and spontaneous change in the stationary state which forever alters and displaces the equilibrium state previously existing; while growth is a gradual and steady change in the long run which comes about by a gradual increase in the rate of savings and population."[5] This view of Schumpeter has been widely accepted and elaborated by the majority of economists. According to Kindleberger, "Economic growth means more output, while economic development implies both more output and changes in the technical and institutional arrangement by which it is produced and distributed. Growth may well involve not only more output derived from greater amounts of inputs but also greater efficiency, *i.e.*, an increase in output per unit of input. Development goes beyond this to imply changes in the composition of output and in the allocation of inputs by sectors."[6] Friedman defines *growth* as an expansion of the system in one or more dimensions out a change in its structure, and *development* as an innovative process leading to the structural transformation of social system.

---

1. Ragnar Nurkse, Problems of Capital Formation in Underdeveloped Countries. p.12.

2. G. Myrdal, Economic Theory and Underdeveloped Region, p. 99.

3. A. Maddison, Economic Progress and Policy in Developing Countries, 1970.

4. U. Hicks, "Learning about Economic Development", *O.E.P.*, Feb. 1957.

5. J.A. Schumpeter, The Theory of Economic Development, 1934.

6. C.P. Kindleberger, Economic Development, 2/e, 1965.

Thus economic growth is related to a quantitative sustained increase in the country's per capita output or income accompanied by expansion in its labour force, consumption, capital and volume of trade. On the other hand, economic development is a wider concept than economic growth. "It is taken to mean *growth plus change.*" It is related to qualitative changes in economic wants, goods, incentives, institutions, productivity and knowledge or the "upward movement of the entire social system", according to Myrdal. It describes the underlying determinants of growth such as technological and structural changes. In fact, economic development embraces both growth and decline. An economy can grow but it may not develop because poverty, unemployment and

inequalities may continue to persist due to the absence of technological and structural changes. But it is difficult to imagine development without economic growth in the absence of an increase in output per capita, particularly when population is growing rapidly.

Despite these apparent differences, some economists use these terms as synonyms. Arthur Lewis is his *The Theory of Economic Growth* writes that "most often we shall refer only to *growth* but occasionally for the sake of variety, to *progress or to development"*. These terms will also be used as synonyms throughout this text.

MEASUREMENT OF ECONOMIC DEVELOPMENT

Economic development is measured in four ways:

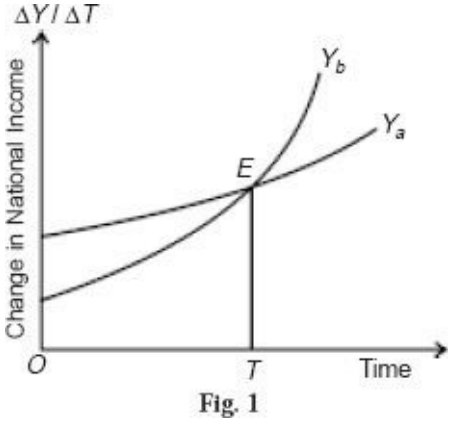

Fig. 1

1. GNP. One of the methods to measure economic development is in terms of an increase in the economy's *real national income* over *a long period* of time. This is explained in terms of Fig. 1 where time *T* is taken on the horizontal axis and change in GNP in relation to time $\Delta Y/\Delta t$ on vertical axis. The curve Y_a shows the level of GNP in country *A* and the curve Y_b in country *B.* Upto time *T,* the increase in GNP in country *A* is higher than in country *B.* But in the long run with the starting of the development process in country *B,* GNP increases at a faster rate than in country *A.* This is clear from the figure where $Y_b > Y_a$ after point *T.* But this. is not a satisfactory definition due to the following reasons:

(1) "Real national income" refers to the country's total output of final goods and services in real terms rather than in money terms. Thus price changes will have to be ruled out while calculating real national income. But this is unrealistic because variations in prices are inevitable. In this measure, the phrase "over a long period of time" implies a sustained increase in real income A short-period rise in national income which occurs during the upswing of business cycles does not constitute economic development.

(2) This measure fails to take into consideration changes in the growth of population. If a rise in real national income is accompanied by a faster growth in population, there will be no economic growth but retardation.

---

7. John Friedmann, in *Growth Centres in Regional Economic Development*, (ed.), N.M. Hansen, 1972.

(3) The GNP figure also does not reveal the costs to society of environmental pollution, urbanisation, industrialisation and population growth. It considers natural resources to be free and treats the earth "like a business in liquidation."

(4) Further, it tells us nothing about the distribution of income in the economy.

(5) Moreover, there are certain conceptual difficulties in the measurement of GNP which are discussed as under:

(a) GNP is always measured in *money,* but there are a number of goods and services which are difficult to be assessed in terms of money, *e.g.*, painting as a hobby by an individual, the bringing up of children by the mother. According to a UN Report, on an average two-thirds of women's work and a quarter of men's work never enter into GNP calculations. By excluding all such services from it, the GNP will work out less than what it actually is.

(b) Another difficulty in calculating GNP is of *double counting* which arises from the failure to distinguish properly between final and intermediate products. There always exists the fear of a good or a service being included more than once. If it so happens, the GNP would work out to be many times the actual.

(c) As a corollary, it double counts both addictions and cures. *First,* when food and wine are consumed. *Second,* when money is spent on the food industry and for curing alcoholism.

(d) GNP makes no distinction between such valuable services as bringing up children and manufacture of such products as wine or cigarettes injurious to health. Thus it equates goods with bads.

(e) Income earned through *illegal activities* such as gambling, or illicit extraction of wine, etc. is not included in GNP. Such goods and services do

have value and meet the needs of the consumers. But by leaving them out, GNP works out to less than the actual.

(j) Then there arises the difficulty of including *transfer payments* in GNP. Individuals get pension, unemployment allowance and interest on public loans, but whether these should be included in national income is a difficult problem. On the one hand, these earnings are a part of individual income and, on the other, they are government expenditure.

(g) Capital gains or *losses* which accrue to property owners by increases or decreases in the market value of their capital assets or changes in demand are excluded from the GNP because such changes do not result from current economic activities. It is only when capital gains or losses are the result of the current flow or non-flow of productive activities that they are included in the GNP.

(h) All *inventory changes* whether negative or positive are included in the GNP. The procedure is to take positive or negative changes in physical units of inventories and multiply them by current prices. Then this figure is added to total current production of the firm. But the problem is that firms record inventories at their original costs rather than at replacement costs. When prices rise there are gains in the book value of inventories. Contrariwise, there are losses when prices fall. So the book value of inventories overstates or understates the actual inventories.

(i) When we deduct capital *depreciation* from GNP, the resulting measure is GNP. Depreciation is a charge on profit which lowers national income. But the problem of estimating the current depreciated value of a piece of capital, whose expected life is, say, fifty years, is very difficult. The usual practice on the part of firms is to base their depreciation provisions on the original cost of their assets. When prices of capital goods are changing, the annual depreciation provision will then measure the cost of using fixed assets for some fifty years (*i.e.*, the time when the assets were bought) rather than the current cost of using them. Unlike inventories, a depreciation valuation adjustment is full of statistical difficulties, such as the age-composition of the whole capital stock, and changes in prices of capital goods every year since the assets were bought.

(j) The calculation of GNP in terms of *money* is the underestimation of real GNP. It does not include the *leisure* forgone in the process of production of a commodity. The income earned by two individuals may be equal, but if one works longer hours than the other, it would be correct to say that the real income of the former has been understated. Thus GNP places no value on leisure.

(k) In calculating GNP, a good number of *public services* are also taken which cannot be estimated correctly. How should the police and military services be estimated? In the days of war, the forces are active, but during peace they rest in cantonments. Similarly, to estimate the contribution made to GNP by profits earned on irrigation and power projects in terms of money is also a difficult problem.

Conclusion. The emphasis on GNP as the index of economic development is based on the application of experience of the developed countries on the underdeveloped countries which differ radically from the socio-economic setup of the former. An OECD Report emphasises in this connection that the developed countries "took for granted that the GNP growth, largely concentrated in the industrial sector, would bring with it automatically full employment and eradication of the poverty as it had seemed to do for them. They failed to remember that during *their* period of early industrialisation, population growth was slow, technology quite labour-intensive, emigration was relatively easy if *people* could not find a job, and there was no competition from already highly industrialised societies or restriction by them on access to their *markets*."[8] Unfortunately, economists in underdeveloped countries and their Western advisers have viewed economic development in such countries as structural transformation whereby the share of agriculture declines and that of manufacturing and service sectors increases in GNP. Accordingly, they have laid stress on such development strategies which aim at rapid industrialisation alongwith urbanisation at the cost of rural and agricultural development. So far as the solutions of such problems as poverty, unemployment and income distribution are concerned, they have been given secondary importance. This is because it is thought that with increase in GNP such problems will be automatically solved in the long run when its benefits would automatically "trickle down" to the poor in the form of increased employment and income opportunities.

But GNP as an index of economic development has not been successful in reducing poverty, unemployment and inequalities, and raising living standards in developing countries. Robert McNamara, the then Governor of the World Bank, admitted in February 1970 the failure of the GNP growth rate as an index of economic development in these words : "In the developing world, at the end of the decade : malnutrition is common, infant mortality is high, life expectancy is low, illiteracy is widespread, unemployment is endemic and growing, the redistribution of income and wealth is severely skewed." Thus GNP cannot be regarded as a measure of economic development.

2. GNP Per Capita. The second measure relates to an increase in the *per capita real income* of the economy over the long period. Economists are one in defining economic development in terms of an increase in per capita real income or output. Meier defines economic development "as the *process* whereby the *real per capita income* of a country increases over a *long period* of time subject to the *stipulations* that the number of people below an 'absolute povery line' does not increase, and that the distribution of income does not become more unequal."[9] This indicator of economic growth purports to emphasize that for economic development the rate of increase in real per capita income should be higher than the growth rate of population. But *difficulties* still remains.

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8. OECD, Development Cooperation 1973 Review, 1973, Italics mine.

9. G.M. Meier, *Leading Issues in Economic Development*, p.7.

1. An increase in per capita income may not raise the real standard of living of the masses. It is possible that while per capita real income is increasing, per capita consumption might be falling. People might be increasing the rate of saving or the government might itself be using up the increased income for military or other purposes.

2. There is another possibility of the masses remaining poor despite an increase in the real GNP per capita if the increased income goes to the few rich instead of going to the many poor.

3. Such a measure subordinates other questions regarding "the structure of the society, the size and composition of its population, its institutions and

culture, the resource patterns and even distribution of output among the society's members."

4. The real per capita income estimates fail to measure adequately changes in output due to changes in the price level. Index numbers used to measure changes in the price level are simply rough approximations. Moreover, the price levels vary in different countries. Consumers' wants and preferences also differ in each country. Therefore, the national income figures of different countries are often misleading and incomparable.

5. International comparisons of the real GNP per capita are inaccurate due to exchange rate conversion of different currencies into a common currency, *i.e.*, US dollars, through the use of official exchange rates. These nominal exchange rates do not reflect the relative purchasing power of different currencies. Thus the comparisons of GNP per capita of different countries are erroneous. The use of a single currency unit for computing the total output of goods and services underestimates the per capita national incomes of underdeveloped countries as compared with the developed ones. The rates of exchanges are primarily based on the prices of internationally traded goods. But many goods and services in underdeveloped countries that are never traded internationally and are also priced low. Economists, therefore, prefer to measure GNP per capita in terms of the purchasing power parity of a country in dollars rather than in exchange rate.

6. The real GNP per capita fails to take into account problems associated with basic needs like nutrition, health, sanitation, housing, water and education. The improvement in living standards by providing basic needs cannot be measured by increase in GNP per capita.

Despite these limitations, the real GNP per capita is the most widely used measure of economic development.

3. Welfare. There is also a tendency to measure economic development from the point of view of *economic welfare.* Economic development is regarded as a process whereby there is an increase in the consumption of goods and services of individuals. According to Okun and Richardson, economic development is "a sustained, secular improvement in material well-being, which we may consider to be reflected in an increasing flow of goods and services".[10]

This indicator is also not free from *limitations.*

First, limitation arises with regard to the weights to be attached to the consumption of individuals. Consumption of goods and services depends on the tastes and preferences of individuals. It is, therefore, not correct to have the same weights in preparing the welfare index of individuals.

Second, in measuring economic welfare caution has to be exercised with regard to the composition of the total output that is giving rise to an increase in per capita consumption, and how this output is being valued. The increased total output may be composed of capital goods. It may be at the cost of a reduced output of consumer goods.

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10. O. Okun and R.W. Richardson, Studies in Economic Development. p.230.

Third, the real difficulty arises in the valuation of the output. The output may be valued at market prices whereas economic welfare is measured by an increase in *real* national output or income. In fact, with a different distribution of income, prices would be different and both the composition and value of national output would also be different.

Fourth, from the welfare point of view we must also consider not only what is produced but how it is produced. The expansion of real national output might have raised the real costs (pain and sacrifice) and social costs in the economy. For instance, the increased output might have resulted from long hours and in the deterioration of the working conditions of the labour force.

Fifth, it is not essential that with the increase in national income, the economic welfare might have improved. It is possible that with the increase in real national income/per capita income, the rich might have become richer and the poor poorer. Thus, mere increase in economic welfare does not lead to economic development till the distribution of national income is equitable or justifiable.

Last, we cannot equate an increase in output per head with an increase in economic welfare, let alone social welfare without additional considerations. To specify an optimum rate of development, we must make value judgements regarding income distribution, composition of output, tastes, real cost and

other particular changes that are associated with the overall increase in the real income.

4. Social Indicators or Basic Needs. Dissatisfied with GNP/GNP per capita as the measure of economic development, certain economists have tried to measure it in terms of social indicators. Economists include a wide variety of items in social indicators. Some are 'inputs', such as nutritional standards or number of hospital beds or doctors per head of population, while others may be 'outputs' corresponding to these inputs such as improvements in health in terms of infant mortality rates, sickness rates, etc. Social indicators are often referred to as the *basic needs for development*. Basic needs focus on alleviation of poverty by providing basic human needs to the poor. The direct provision of such basic needs as health, education, food, water, sanitation and housing affects poverty in a shorter period and with fewer monetary resources than GNP/GNP per capita strategy which aims at increasing productivity and incomes of the poor automatically over the long run. Basic needs lead to a higher level of productivity and income through human development in the form of educated and healthy people.

The merit of social indicators is that they are concerned with ends, the ends being human development. Economic development is a means to these ends. Social indicators tell us how different countries prefer to allocate the GNP among alternative uses. Some may prefer to spend more on education and less on hospitals. Moreover, they give an idea about the presence, absence or deficiency of certain basic needs.

Hicks and Streeten[11] consider six social indicators for basic needs:

Basic Needs	*Indicator*
1. Health	Life expectancy at birth.
2. Education	Literacy signifying primary school enrolment as per cent of population.
3. Food	Calorie supply per head.
4. Water Supply	Infant mortality and percentage of population with access to potable water.
5. Sanitation	Infant mortality and percentage of population with access to

	sanitation.
6. Housing	None.

11. Norman L. Hicks and Paul P. Streeten, "Indicators of Development : The Search for a Basic Needs Yardstick," *World Development*, Vol. 7, 1979.

Except for calorie supply per head, all other indicators are output indicators. Of these, infant mortality is both the indicator of sanitation and clean drinking water facilities because children are prone to water-borne diseases. It is also related to life expectancy at birth and nutritional deficiencies among infants. Thus, the infant mortality rate measures four of the six basic needs.

Limitations. The following are the limitations of social indicators as the measure of economic development. Problems arise in constructing a composite index based on a rational weighting system.

First, there is no unanimity among economists as to the number and type of items to be included in such an index. For instance, Goldstein takes only infant mortality as an indicator of basic needs to construct an index.[12] Hagen,[13] and UNRISD[14] use eleven to eighteen items with hardly a few common. On the other hand, Morris uses only three items, *i.e.*, life expectancy at birth, infant mortality and literacy rate in constructing a "Physical Quality of Life Index" relating to 23 developed and developing countries of the world for a comparative study.

Second, there is the problem of assigning weights to the various items which may depend upon the social, economic and political setup of the country. This involves subjectivity. Morris D. Morris[15] assigns equal weights to the three indicators which undermine the value of the index in a comparative analysis of different countries. If each country chooses its own list of social indicators and assigns weights to them, their international comparisons would be as inaccurate as GNP figures.

Third, social indicators are concerned with current welfare and are not related to the future.

Fourth, the majority of indicators are inputs and not outputs, such as education,

health, etc.

Last, they involve value judgements. Therefore, in order to avoid value judgements and for the sake of simplicity, economists and UN organisations use GNP per capita as the measure of economic development.

BASIC NEEDS *VS* ECONOMIC GROWTH

Is there any conflict between economic growth and basic needs strategy? As already noted above, basic needs are concerned with ends and economic growth is a means to these ends. So there is no conflict between basic needs and economic growth. Goldstein found a strong correlation between economic growth and basic needs, as measured by infant mortality rates. He indentifies economic growth with efficiency. To him, efficiency is the level of GDP required to reach the infant mortality target of below 5 per cent. Countries that spend a large percentage of their GDP for public health are more efficient because they are able to reduce their infant mortality rates. He found that a few developing countries have used very modest resources to meet the basic needs of health and education. In his cross-sectional study, he took school enrolment and female educational attainment alongwith health. He found that a few UDCs had used very modest resources to meet the basic needs of education and health. He came to the conclusion that those UDCs that concentrate on primary school education and women's education can develop more by spending less to meet these basic needs.

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12. J.S. Goldstein, "Basic Human Needs: The Plateau Curve", *World Development*, Vol. 13, 1985.

13. E.E. Hagen, "A Framework for Analysing Economic and Political Development" in *Development of Emerging Countries*, (ed.) R.E. Asher, 1962.

14. United Nations Research Institute for Social Development (UNRISD), *Contents and Measurement of Social Economic Development*, 1970.

15. Morris D. Morris, *Measuring the Condition of the World's Poor : The Physical Quality of Life Index*, 1979.

Fei, Ranis and Stewart[16] found that meeting basic needs do not reduce productive investment in developing countries. They took a sample of nine countries. Their study revealed that Taiwan, South Korea, the Philippines,

Uruguay and Thailand provided good basic needs and had *above* average investment ratios, whereas Columbia, Cuba, Jamaica and Sri Lanka had average investment ratios with good basic needs. They also related above average and below average economic growth and performance in providing basic needs for nine different countries. Of these, Taiwan, South Korea and Indonesia which had provided good basic needs had also *above* average economic growth. Brazil with bare minimum basic needs had also *above* average economic growth. On the other hand, Somalia, Sri Lanka, Cuba and Egypt had *below* average economic growth even by providing good basic needs. One country, Male, with bare minimum basic needs had *below* average economic growth. They concluded that the provision for more basic needs does lead to economic growth. Norman Hicks has also shown in his study that the basic needs strategy had led to increase in the growth rate of a number of developing countries.

CONCLUSION

Let us compare the effects over time of GNP/GNP per capita, welfare and basic needs approaches to economic development. Figure 2 shows three paths A_1, A_2 and A_3. Time is taken on the horizontal axis and the growth rate as measured by the consumption per head of the poor on the vertical axis. Path A_1 relates to the GNP/GNP per capita strategy. It shows that in the beginning the consumption per head of the poor declines up to time T_1 because with rapid industrialisation and urbanisation, poverty, unemployment and inequalities increase. When the gains from the growth of GNP/GNP per capita "trickle down" to the poor, their employment and incomes increase and per capita consumption also increases from time T_1 upwards.

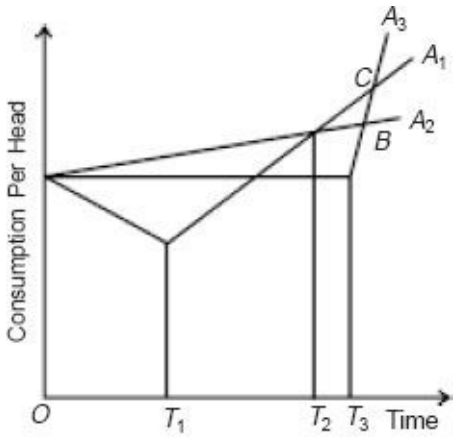

Fig. 2

Path A_2 relates to the welfare approach which shows a gradual increase in per capita consumption of the poor. It lags behind path A_1 from time T_2.

Path A_3 relates to the basic needs approach. In the beginning, high priority is given meeting the basic minimum current consumption level of the poor which may be below the consumption levels of the GNP/GNP per capita and welfare approaches up to time T_3 . When the basic needs of the poor are met over time and their levels of productivity and incomes increase, growth is steeper from time T_3 upwards. Path A_3 overtakes first path A_2 at point *B* and then path A_1 at point *C*. Thus, the basic needs strategy is better than the GNP/GNP per capita and welfare strategies of economic development.

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16. C.H. Fei, G. Ranis and F. Stewart, *Basic Needs : A Framework for Analysis*, 1979.

HUMAN DEVELOPMENT INDICES

Economists have tried to measure social indicators of basic needs by taking one, two or more indicators for constructing composite indices of human development. We study below the Physical Quality of Life Index (PQLI) of Morris and the Human Development Index (HDI) as developed by the United Nations Development Programme (UNDP).

1. PHYSICAL QUALITY OF LIFE INDEX (PQLI)

The Physical Quality of Life Index was the most serious challenge to GNP per capita as the index of development. It was invented by M.D. Morris in 1979. He constructed a composite Physical Quality of Life Index (PQLI) relating to 23 developing countries for a comparative study. He combined three component indicators of infant mortality, life expectancy at age one and basic literacy at age 15 to measure performance in meeting the most basic needs of the people. This index represents a wide range of indicators such as health, education, drinking water, nutrition and sanitation. The PQLI shows improvement in the quality of life when people enjoy the fruits of economic progress with increase in life expectancy (LE), fall in infant mortality rate (IMR) and rise in basic literacy rate (BLR).

Each indicator of the three components is placed on a scale of zero to 100 where *zero* represents an absolutely defined *worst* performance and 100 represents an absolutely defined *best* performance. The PQLI index is

calculated by averaging the three indicators giving equal weight to each and the index is also scaled from 0 to 100.

If the indicators of life expectancy and basic literacy rate are *positive, the best* performance is shown as the *maximum* and the *worst* as the *minimum.* Infant mortality rate being a *negative* indicator, for this the *best* indicator is shown as the *minimum* and the *worst* as the *maximum.* To find out the achievement level of the positive variable, its minimum value is deducted from its actual value and the balance is divided by the difference (range) between maximum value and minimum value i.e.

$$\text{Achievement Level} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Max. Value} - \text{Min. Value}}$$

To find out the achievement level for a *negative* indicator, its actual value is deducted from its maximum value and the balance is divided by the difference (range) between maximum value and minimum value i.e.

$$\text{Achievement Level} = \frac{\text{Max. Value} - \text{Actual Value}}{\text{Max. Value} - \text{Min. Value}}$$

For life expectancy and infant mortality rate, there is no natural maximum and minimum value. But there is need to select the right values.

According to Morris, each of the three indicators measures results and not inputs such as income. Each is sensitive to distribution effects. It means that an improvement in these indicators signifies an increase in the proportion of people benefiting from them. But none of the indicators depends on any particular level of development. Each indicator lends itself to international comparison. Taking Gabon's infant mortality rate of 229 per thousand live births as the worst rate in 1950, Morris sets it at 0. At the upper end, the best achievement is set at 9 per thousand for the year 2000. Again, taking Vietnam's life expectancy at age one as 38 years in 1950, Morris sets it at 0 of the life expectancy index. The upper limit is set at 77 years for men and women combined for the year 2000. Lastly, the basic literacy rate at 15 years is taken as the literacy index. This set of values is presented in Table 1.

Table 1: Maximum and Minimum Values of Component

Indicators

Dimension	*Maximum*	*Minimum*	*Range*
Infant Mortality Rate	229	9	220
Life Expectancy at Age One	77	38	39
Basic Literacy Rate	180	0	100

One this basis, Morris presents the following correlation:

(N = 150)	Infant Mortality Rate	Life Expectancy
Life Expectancy at Age One	–0.919	– +
Literacy Rate	–0.919	0.897

The coefficient of correlation between life expectancy at age one and infant mortality is of a high degree and negative. Similar is the correlation between literacy and infant mortality rate *i.e.*, with literacy the infant mortality rate declines. The coefficient between literacy and life expectancy shows a high degree of positive correlation *i.e.*, with literacy, the life expectancy also increases. Morris regards life expectancy at age one and infant mortality rate as very good indicators of the physical quality of life. So are literacy and life expectancy. In fact, the literacy indicator reflects the potential for development. We present in Table 2 the PQLI performance and GNP per capita of two LDCs and two developed countries.

Table 2 : PQLI Performance and GNP Per Capita Growth Rate

Country	*PQLI*			*Average annual GNP Per capita Growth Rate*
	1950	*1960*	*1970*	
India	14	30	40	1.8
Sri Lanka	65	75	80	1.9
Italy	80	87	92	5.0
USA	89	91	93	2.4

Source : Morris D. Morris and M.B. McAlpin, *Measuring the Conditions of India's Poor,* 1982.

The above table reveals that India which Morris calls a “basket case” exhibited slow but not insignificant improvement in its PQLI from 14 to 40 over a period of two decades from, 1950 to 1970, despite its low growth in average GNP per capita of 1.8. On the other hand, Sri Lanka’s PQLI was much higher than India’s during this period, though its average GNP per capita was almost the same. Of the two developed countries, both Italy and USA had very high PQLI. But Italy’s average GNP per capita was more than double the USA. In this connection, Morris observes that here is no automatic link between GNP per capita and PQLI. In fact, the presence or absence of social relations, nutritional status, public health, education and family environment determine a society’s PQLI. Further, it takes considerable time to build institutional arrangements that can generate and sustain a high PQLI.

Its Limitations. The PQLI tries to measure “quality of life” directly rather than indirectly. But it has its limitations.

1. Morris admits that PQLI is a limited measure of basic needs.

2. It supplements but does not supplant the GNP. It fails to dislodge GNP from its lofty perch.

3. It does not explain the changing structure of economic and social organisation. It, therefore, does not measure economic development.

4. Similarly, it does not measure total welfare.

5. Morris has been criticised for using equal weights for the three variables of his PQLI which undermine the value of the index in a comparative analysis of different countries.

According to Meier, “Non-income factors captured by the PQLi are important, but so are income and consumption statistics and distribution-sensitive methods of aggregation *that are ignored by it.*”[17]

Conclusion. Despite these limitations, the PQLI can be used to identify particular regions of underdevelopment and groups of society suffering from the neglect or failure of social policy. It points towards that indicator where immediate action is required. The state can take up such policies which

increase the PQLI rapidly alongwith economic growth.

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17. G.M. Meier, *Leadng Issues in Economic Development*, p. 9.

CONSTRUCTION OF PQLI

On the basis of the values of the component indicators given in Table 1, we can construct the PQLI on the basis of the three indices in the following manner :

$$\text{IMRI} = \frac{229 - \text{Actual IMR}}{220}$$

$$\text{LEI} = \frac{\text{Actual Life Expectancy} - 38}{39}$$

$$\text{BLI} = \frac{\text{Actual Literacy Level} - O}{100}$$

We calculate the PQLI for India on the basis of 2001 Census data for these variables : IMR = 67, LE = 65 years, and BL = 65%.

$$\text{IMRI} = \frac{229-67}{220} = 0.74$$

$$\text{LEI} = \frac{65-38}{39} = 0.69$$

$$\text{BLI} = \frac{65-0}{100} = 0.65$$

$$\text{PQLI} = \frac{\text{IMRI} + \text{LEI} + \text{BLI}}{3} = \frac{0.74 + 0.69 + 0.65}{3}$$

$$= \frac{2.08}{3} = 0.69$$

Thus the Physical Quality of Life Index for India in 2001 was 0.69.

2. HUMAN DEVELOPMENT INDEX (HDI)

Lord Meghnad Desai and Nobel Laureate Amartya Sen invented the Human Development Index and UNDP incorporated it into its first Human Development Report in 1990.

Since then, the UNDP has been presenting the measurement of human

development* in its annual report. The HDI is a composite index of three social indicators : life expectancy, adult literacy and years of schooling. It also takes into account real GDP per capita. Thus, the HDI is a composite index of achievements in three fundamental dimensions : living a long and healthy life, being educated and having decent standard of living.

The HDI value of a country is calculated by taking three indicators :

1. *Longevity,* as measured by life expectancy at birth.

2. *Educational attainment,* as measured by a combination of adult literacy (two-thirds weight) and combined primary, secondary and tertiary enrolment ratio (one-third weight).

3. *Decent standard of living,* as measured by real GDP per capita based on purchasing power parity in terms of dollar (PPP$).

Before the HDI is calculated, an index is created for each of these dimensions: Life Expectancy Index, Education Index and GDP Index. To calculate these indices, minimum and maximum values or goal posts are chosen for each indicator as shown in Table 3.

Table 3: Goalposts for Calculating the HDI

Indicator	*Max. Value*	*Min Value*
Life Expectancy at Birth (yrs)	85	25
Adult Literary Rate (%)	100	0
Combined Gross Enrolment Ratio (%)	100	0
GDP Per Capita (PPP US$)	40,000	100

Performance in each dimension is expressed as a value between 0 and 1 by applying the following formula :

$$\text{Dimension Index} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Max. Value} - \text{Min. Value}}$$

The *HDI* is then calculated as a simple average of the three dimension indices.

* For the meaning of Human Development refer to the last section of this chapter.

The *HDI value* for each country indicates the distance it has travelled towards the maximum possible value of 1 and how far it has to go to attain certain defined goals : an average life span of 85 years, access to education for all and a decz. The DHI ranks countries in relation to each other. A country's *HDI rank* is within the world distribution *i.e.*, it is based on its HDI value in relation to each developed and developing country for which the particular country has travelled from the minimum HDI value of 0 towards the maximum HDI value of 1. Countries with an HDI value below 0.5 are considered to have a *low* level of human development, those between 0.5 to 0.8 a *medium* level, and those above 0.8 a *high* level. In the HDI, countries are also ranked by their GDP per capita.

The *Human Development Report*, 2004 presented the HDI values, HDI rank, and real GDP per capita ranks for the year 2002 relating to 177 developed and developing countries. Table 4 shows HDI values and HDI ranks for some of the countries.

Table 4 : Human Development Index for Selected Countries, 2002

	Country	*HDI Value*	*HDI Rank*	*GDP Per Capita Rank minus HDI Rank*
1.	**High Human Development**			
	Norway	0.956	1	1
	Australia	0.946	3	9
	USA	0.939	8	-4
	Japan	0.938	9	6
	United Kingdom	0.936	12	8
	France	0.932	16	0
	Costa Rica	0.834	45	14
2.	**Medium Human Development**			

	Russian Federation	0.795	57	3
	Malaysia	0.793	59	-2
	Mauritius	0.785	64	-15
	China	0.745	94	5
	Sri Lanka	0.740	96	16
	India	0.595	127	-10
	Bhutan	0.536	134	0
	Nepal	0.504	140	11
3.	**Low Human Development**			
	Pakistan	0.497	142	-7
	Uganda	0.493	146	4
	Zimbabwe	0.491	147	-25
	Kenya	0.488	148	11
	Nigeria	0.466	151	?
	Tanzania	0.407	162	15
	Zambia	0.389	164	3

Of the 177 countries for which the HDI was calculated, 55 were in the high development category (with an HDI value of 0.80 or more); 86 in medium category (0.5 to 0.79); and 36 in the low category (less than 0.50), Norway, Australia and USA led the HDI rankings in the high HD category. In the *medium* category, Bulgaria led with HDI rank of 56, Sri Lanka 96, India, 127, Bhutan 134, Bangladesh 138, and Nepal 140. In the Low category, Pakistan led with 142 rank, Uganda 146, Zimbabwe 147, Nigeria 151, Tanzania 162 and Zambia 164. Thus the DHI reveals wide disparities in global human development. For instance, Norway's HDI value of 0.956 was more than three times of Sierra Leone's of 0.273 which was at the bottom.

The HDI reveals that countries can have similar GDP per capita levels but different HDI values or similar HDI values but very different GDP per capita levels. Thus the HDI ranking of countries differ significantly from their ranking by GDP per capita. Countries whose GDP rank is higher than their HDI rank have considerable *potential* for distributing the benefits of higher incomes more equitably. But they have been less successful in channelising economic prosperity into better lives from their people. Of the 177 counties in

2002, there were 71 such countries whose HDI rank was lower than their GDP per capita rank. Prominent among them were Algeria (–103), India (–10), USA (–4), Pakistan (–7) and Zimbabwe (–25). On the other hand, countries whose HDI rank is higher than their GDP rank, suggest that they have effectively *made use* of their incomes to improve the lives of their people. There were 106 such countries in 2002. Prominent among them were Cuba (39) and Tajikistan (45).

It is said that the DHI led to the dethronement of GDP per capita. As a matter of fact, these two concepts do not measure the same thing. The HDI tries to measure the level of human capabilities, the set of choices available to people. On the other hand, GNP per capita is an indicator of well being, utility or welfare, the subjective enjoyment people get from consumption. Thus the HDI is an alternative measure of development. It supplements rather than supplants GNP per capita measure of development and provides different information from GNP per capita.

Its Limitations. The HDI is not free from certain limitations.

1. It is a *crude index* which attempts to catch in one simple number a complex reality about human development and deprivation, according to Prof. Amartya Sen.

2. The three indicators are not the only indicators of human development. There can be others like infant mortality, nutrition, etc.

3. The HDI measures relative rather than absolute human development so that if all countries improve their HDI value at the same weighted rate. The low human countries will not get recognition for their improvement.

4. The weighting scheme for calculating the four components of HDI seems arbitrary.

5. Even giving equal (1/3rd) weight to each of the very different three indices for calculating the HDI is arbitrary. To the extent one component index has a different variance than another, equal weights seem unsatisfactory and unjustify.

6. A country having high HDI may shift the focus from the high inequality,

unemployment and poverty found within it.

Conclusion. Despite these weaknesses, by measuring average achievements in health, education and income, the HDI provides a better picture of the state of a country's development than its income alone.

CONSTRUCTING THE HUMAN DEVELOPMENT INDEX (HDI)

The HDI is based on three indicators : longevity, as measured by life expectancy at birth; educational attainment, as measured by a combination of adult literacy (two-thirds weight) and combined primary, secondary and tertiary enrolment ratios (one-third weight); and standard of living, as measured by real per capita (PPP$).

For the construction of the index, fixed minimum and maximum values have been set for each of these indicators :

(i) Life expectancy at birth : 25 years and 85 years for calculating the Life expectancy Index.

(ii) Adult literacy : 0% and 100% for calculating the education Index.

(iii) Combined gross enrolment ratio (0% and 100%)

(iv) Real GDP per capita (PPP$): $100 and $40,000 (PPP US$) for calculating GDP Index.

For any component of the HDI, individual indices can be computed by applying the formula:

$$\text{Dimension Index} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Max. Value} - \text{Min. Value}}$$

1. Life Expectancy Index. It the life expectancy at birth of a country is 78 years, then the life expectancy index for that country would be

$$\text{Life Expectancy Index} = \frac{78-25}{85-25} = \frac{53}{60} = 0.884$$

2. Education Index. The education Index is the combination of adult literacy index and gross enrolment index. If the adult literacy rate of this country is 92, then its adult literacy index would be

$$\text{Adult Literacy Index} = \frac{92-0}{100-0} = 0.920$$

If the combined gross enrolment in this country is 60, then its gross enrolment index would be

$$\text{Gross Enrolment Index} = \frac{60-0}{100-0} = 0.600$$

$$\begin{aligned}\text{Education Index} &= 2/3\ (\text{Adult Literacy Index}) \\ &\quad + 1/3\ (\text{Gross Enrolment Index}) \\ &= 2/3\ (0.920) + 1/3\ (0.600) = 0.813\end{aligned}$$

3. **GDP Index.** The GDP per capita (PPPUS$) of this country is $8,840, then the GDP index would be

$$\text{GDP Index} = \frac{\log(8{,}840) - \log(100)}{\log(40{,}000) - \log(100)} = \frac{\log 8740}{\log 39{,}900} = 0.748$$

4. Human Development Index. The HDI is a simple average of the Life Expectancy Index, Education Index and adjusted GDP per capita (PPP$) Index. It is derived by dividing the sum of these three indices by 3,

$$\begin{aligned}\text{HDI} &= 1/3\ (0.884) + 1/3\ (0.813) + 1/3\ (0.784) \\ &= 0.295 + 0.271 + 0.249 = 0.815\end{aligned}$$

This country comes under the category of high human development.

DEVELOPMENT ECONOMICS IN RETROSPECT[18]

Over the past fifty years, development economics has undergone many changes. The emphasis has shifted from growth in GNP per capita to the creation of employment, to redistribution of income, to basic human needs, to structural adjustment and sustainable development.

GNP Per Capita. In the 1950s, economic development had been identified with the growth of GNP/GNP per capita. The United Nations in a resolution set

the target rate of 5 per cent in GNP of LDCs (less developed countries) for the development decade of the 1960s. To achieve the targeted growth rate, economists in LDCs suggested rapid industrialisation alongwith urbanisation. This view was based on Rostow's thesis of the stages of growth, whereby development proceeded along a linear path through a number of stages. The most important stage which caught the fancy of LDCs was the 'take-off'. So far as the problems of poverty, unemployment, and income distribution were concerned, they were given secondary importance. It was believed that the gains from the growth of GNP per capita would automatically 'trickle down' to the poor in the form of increased employment and income opportunities.

This linear view was further strengthened by the Nurksian dictum of 'vicious circles' of low savings, small markets and population pressures. It was believed that the removal of these vicious circles would set free the natural forces which would lead to higher growth. For this, Rosenstein Rodan advocated the Big Push; Nurkse, the Balanced Growth; Hirschman, the Unbalanced Growth; and Leibenstein, the Critical Minimum Effort. But greater emphasis was laid on international aid to provide the 'missing components' in the form of capital, technical know-how, foreign exchange, etc. The rationale behind foreign aid was the 'two-gap model' and industrialisation via import substitution so that aid might be gradually dispensed with by LDCs.[19]

David Morawetz's estimates showed that as a result of the adoption of these development strategies, the GNP per capita of the developing countries grew at an average rate of 3.4 per cent per annum during 1950-75. This was faster than the rate at which either the developed countries or LDCs had grown in any comparable period prior to 1950, and exceeded both official goals and private expectations.[20] But the growth of GNP per capita failed to solve the problems of poverty, unemployment and inequalities in such countries.

The criticism against GNP as an index of economic development had been gaining momentum among economists in the 1960s. But the first public salvo was let loose by Dudley Seers in his presidential address at the Eleventh World Conference of the Society for International Development held in New Delhi in 1969. He posed the problem thus: "The questions to ask about a country's development are therefore: What has been happening to poverty? What has been happening to unemployment? What has been happening to inequality? If

all three of these have declined from high levels, then beyond doubt this has been a period of development for the country concerned. If one or two of these central problems have been growing worse, especially if all three have, it would be strange to call the result 'development' even if per capita income doubled." Robert McNamara, the then Governor of the World Bank, admitted in February 1970 the failure of the GNP growth rate as an index of economic development in LDCs in these words: "In the first Development Decade, the primary development objective, a five per cent annual growth in GNP, was achieved. This was a major accomplishment. But this relatively high rate of growth in GNP did not bring satisfactory progress in the development. In the developing world, at the end of the decade : malnutrition is common, infant mortality is high, life expectancy is low, illiteracy is widespread, unemployment is endemic and growing, the redistribution of income and wealth is severely skewed."

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18. Revised version of a paper presented at the Haryana Economic Association Conference held at Arya College, Panipat on 10-11 March, 1984.

19. All concepts, theories and models mentioned in this section have been discussed in subsequent chapters in the book.

20. D. Morawetz, *Twenty-Five Years of Economic Development*, 1977.

From the 1970s, the emphasis shifted from the growth rate in GNP to the quality of the development process of progressive reduction in absolute poverty, unemployment and inequalities. All those engaged with the development process gave attention to three different, though largely complementary strategies: increasing employment, reducing inequalities in income and wealth, and meeting basic human needs.

Employment Creation. During the 1950s and 1960s, the LDCs had high rates of growth of industrial production and economic growth, but these rates failed to create enough employment.

It was in 1954 that Arthur Lewis[21] advocated that the problem of unemployment in LDCs would be solved automatically with the movement of the subsistence and landless labourers to the higher-wage urban capitalist industries. This process would increase inequalities in the early stages of growth but when the growth process gains momentum, the rural unemployed

workers would be absorbed in the modern capitalist sector, and both unemployment and inequalities would be removed. The Lewis view continued to prevail in LDCs for almost two decades but it failed to solve the problem of unemployment due to three reasons: (*a*) Population and labour force grew at a faster rate than expected; (*b*) the gap between the capitalist wage and the subsistence wage was much higher than assumed by Lewis due to wage differentials and trade union influences in urban areas; and (*c*) the LDCs adopted labour-saving technologies in the urban capitalist sector which increased output per man without creating additional jobs.

So employment became a major policy issue of LDCs and international agencies since the 1970s. The emphasis shifted from output or growth approach to income or poverty approach to the employment problem which laid emphasis on the quality rather than on the quantity of employment. Industrial development having failed to provide large employment opportunities, increasing attention was paid on the adoption of employment generating schemes specifically directed towards the urban and rural poor so as to increase their productivity and incomes.

Income Inequality. In the 1950s and 1960s, the thinking on income inequality and development was influenced by Kuznets' inverted U-shaped curve.[22] Kuznets suggested on the experience of the developed countries that historically there was a tendency for income inequality to increase first, and then to be reduced as countries developed from a low level. Accordingly, it was believed that a high degree of inequality in the distribution of income had a favourable effect on economic growth in the early stage of development and as development gained momentum its benefits would automatically 'trickle down' to the lower income groups over the long run. So this development approach emphasised the maximisation of the growth rate of the economy by building up capital, infrastructure and productive capacity of the economy and leaving the distribution of income untouched. It was like riding the horse of economic development and leaving the horse of economic equality to feed for itself.

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21. W.A. Lewis : "Economic Development with Unlimited Supplies of Labour", *The Manchester School*, May 1954.

22. S. Kuzents, "Economic Growth and Income Inequality", *A.E.R.*, March, 1955.

Arthur Lewis[23] was the principal supporter of this strategy. He outlined the process through which income inequalities led to the economic growth of the 19th century England, 19th century Western Europe and the early 20th century Japan. He advocated the same for LDCs. He contended that the voluntary savings formed a significantly large share of the national income where the inequality of income distribution was such that profits were relatively large share of the national income. With development, the modern sector grew faster than the traditional sector and the relative share of profits in national income also increased. This tended to perpetuate income inequalities. In the long run, when employment opportunities increased all-around and the traditional sector also developed, the distribution of income would stabilise. This was an automatic process and was only a side effect of the growth of the economy.

Despite the inadequacy and non-comparability of data and the controversy over the use of the indicators of inequality, a number of empirical studies revealed that income inequalities had widened in the majority of LDCs. They convinced the policy makers and economists in LDCs and international organisations that the living standards of the very poorest in such countries had declined both in absolute and relative terms.

Basic Human Needs. Dissatisfied with growth, employment and income distribution approaches of development, economic thinkers turned towards the "basic human needs" strategy for promoting human well-being, especially that of the poor. The World Bank's first mission to an LDC, Columbia, in 1950 had stated its objective in terms of meeting "basic human needs".

But this objective was not taken due note on account of the multiplicity of planning objectives in LDCs in those early years. It was, however, at the World Employment Conference of 1976 that the ILO espoused the concept of a "basic needs strategy". India was the first among LDCs to adopt this in its Fifth Five-Year Plan in 1974, two years ahead of the ILO declaration.

The basic human needs strategy laid emphasis on providing basic material needs in terms of health, education, water, food, clothing and shelter. The basic needs strategy had three components. *First*, it aimed at raising productivity and incomes of the rural and urban poor in labour surplus LDCs through labour-intensive production techniques by providing them basic needs. *Second,* it

emphasised the removal of poverty by providing such public services as education, drinking water and health. *Third,* such public services were financed by the government. But in actuality, the focus was only on the second item—the delivery of basic public services. As a result, the basic strategy was criticised as a prescription to "count, cost and deliver", i.e., count the poor, cost the number of public services and deliver them to the poor. It was thus regarded as state action from top to bottom. *Fourth,* it was criticised for not providing the poor with productive assets and capital.

Stabilisation and Structural Adjustment. In the early 1980s, the decline in the growth rate of developed countries, the rise in oil prices, the debt crisis in developing countries and the worsening of their terms of trade, pushed the basic needs strategy in the background. Many countries embarked on programmes of stabilisation and structural adjustments. Initially, stabilisation measures, supported by the IMF and World Bank, aimed at reducing inflation, both budget and trade deficits, cutting public spending, reducing wages and raising interest rates. But these measures often led to recession in some countries. Moreover, these were short-term measures. Goaded by the World Bank and IMF, many developing countries switched to long-term structural adjustment programme. It is a domestically designed programme of reforms by following the policies of liberalisation, adjustment and privatisation. These "involve reducing the role of the state, removing subsidies, liberalising prices and opening economies to flows of international trade and finance." These often include measures to reduce the fiscal deficit. The majority of LDCs are still pursuing structural adjustment programmes. But these have led to reduction in government spending on social services like health and education. Poverty and unemployment have increased and the concern for the poor has been pushed into the background.

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23. A.W. Lewis, *The Theory of Economic Growth*, 1955.

Human Capabilities. During this period of liberalisation, adjustment and privatisation, Prof. Amartya Sen emphasised on the concept of promoting *'human capabilities'*. According to him, at the core of human well-being is freedom of choice by enhancing people's capabilities for attaining higher standards of health, knowledge, self-respect and the ability to participate actively in community life. The standard of living of a society should not be

judged by GNP per capita and the supply of particular goods but by people's capabilities, *i.e.*, what a person can or cannot do, can or cannot be. It is entitlements, the set of alternative commodity bundles that a person can command in society that generate these entitlements. The relevant capabilities are: being free from starvation, from hunger, from undernourishment; participation in communal life; being adequately sheltered and so on. The expansion of these capabilities implies freedom of choices—political, social, economic and cultural freedom.[24]

Sen's human capabilities concept has been criticised on the following grounds: *First*, the freedom of choices goes beyond economic development when freedom from servitude, freedom from religion and political freedom are included. *Second*, the problem is of measuring each of these items. How to measure the achievement of social and political objectives when data for measuring economic indicators are not available in LDCs. It is, therefore, advisable to confine the concept of human capabilities to only freedom from starvation, hunger, etc. which relate to economic capabilities.

Human Development. The UNDP incorporated Sen's view in its first *Human Development Report* in 1990. According to it, human development goes far beyond income and growth to cover all human capabilities the needs, aspirations and choice of the people. It defined human development as "a process of enlarging people's choices" that are created by expanding human capabilities. Income is *one* of the choice but it is not the *only* choice. Rise in income is not the same thing as the increase in human capabilities. Besides higher income, poor people put a high value on adequate nutrition, access to safe drinking water, better medical facilities, better schooling for their children, affordable transport, adequate shelter, secure livelihood and productive and satisfying jobs.

Human development is a broad and comprehensive concept. It is as much concerned with economic growth as with its distribution, as with basic human needs as with variety of human aspirations, as with the distress of the rich countries, and as with the human deprivation of the poor. The Report also explained the relationship between economic growth and human development. It emphasised that there is no automatic link between the two. Economic growth is important because no society has been able to sustain the well being of its

people without continuous growth. So economic growth is essential for human development. But human development is equally important because it is healthy and educated people who contribute more to economic growth through productive employment and increase in income. Thus, human development and economic growth are closely connected. In reality, economic growth is a means to an end, and the end is human development. Policy-makers should, therefore, pay more attention to the quality of growth so as to support all-round human development.

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24. A.K. Sen, "Development as Capability Expansion", *Journal of Development Planning*, (1971, 1989.

Sustainable Development. In 1987, the World Commission on Environment and Development (Brundtland Commission) used a new concept of 'sustainable development'. It defined the term 'sustainable development' as "meeting the needs of the present generation without compromising the needs of the future generation". Economic development must be sustainable which means that it should "keep going". The *World Development Report 1999-2000* emphasises the creation of sustainable improvements in the quality of life for all people as the principal goal of development policy. According to it, sustainable development has many objectives. Besides increasing economic growth and meeting basic needs, the aim of lifting living standards includes a number of more specific goals: "bettering people's health and educational opportunities, giving everyone the chance to participate in public life, helping to ensure a clean environment, promoting intergenerational equity, and much more." Thus meeting the needs of the people in the present generation is essential in order to *sustain* the needs of future generations.

CHAPTER

Economic Growth and Income Distribution: The Kuznets Hypothesis

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THE KUZNETS HYPOTHESIS

There has been much controversy among economists over the issue whether economic growth increases or decreases income distribution. Prof. Kuznets is the first economist to study this problem empirically.[1] He observes that in the early stages of economic growth relative income inequality increases, stabilises for a time and then declines in the later stages. This is known as the *inverted U-shaped hypothesis* of income distribution.

In his 1955 Study, Kuznets takes the following data relating to three LDCs– India, Ceylon and Puerto-Rico and two DCs—U.K. and U.S.

Table 1 shows that in LDCs 60% of the poorest received 30% and less of national income, whereas in DCs they received more than 30% of national income. So far as the richest 20% in LDCs are concerned, they received 50% and more of national income. In DCs, they received 45% and less. Kuznets comes to the conclusion that the size distribution of income was more unequal in LDCs than in DCs. It was high (1.67 to 2.33) in LDCs and low (1.25 to 1.29) in DCs.

TABLE 1 : Relative Income Inequality in Various Countries in about 1950

Country	Income Share%		Ratio = Richest 20% / Poorest 60%	
	Poorest 60%	Richest 20%		
India (1949-50)	28	55	1.96	
Ceylon (1950)	30	50	1.67	LDCs
Puerto-Rico (1948)	24	56	2.33	
United Kingdom (1950)	34	44	1.29	DCs
United States (1947)	36	45	1.25	

It was in his 1963 Study that Kuznets developed his inverted U-shaped hypothesis by taking the data of 18 countries by size distribution of income. On their basis, he constructed different Lorenz curves for DCs and LDCs and derived their Gini coefficients. It was 0.37 for DCs and 0.44 for LDCs. It showed that income inequalities were higher in LDCs than in DCs and . This is explained in Figure 1 where the 45° straight line *OD* is of equal income distribution. The thick curve to the right and nearer to this line is the Lorenz curve of DCs. The dotted curve further to the right represents the Lorenz curve of LDCs.[2]

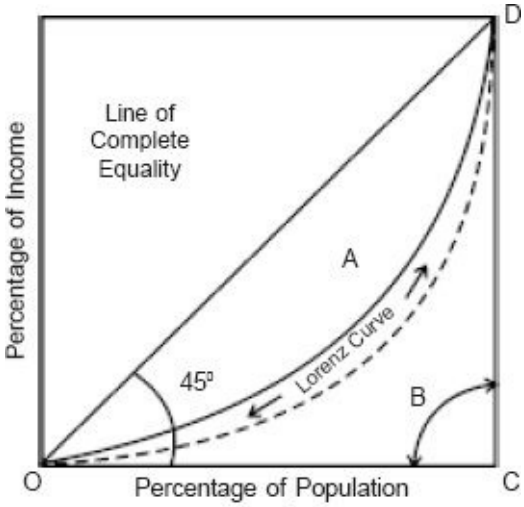

Fig. 1

But the Gini coefficient of distribution is a better measure of the degree of income inequality. It varies from 0 (complete equality) to 1 (complete inequality). The larger the coefficient, the greater the inequality. The Gini coefficient is measured in Figure 1 as the ratio of area *A/A + B or A/* Δ *OCD*. The greater is this ratio, the more unequal is the distribution of income i.e., the more the Lorenz curve falls below the 45° line. In Figure 1, the area A covered by the thick Lorenz curve roughly represents 37% of the triangle *OCD* for DCs and the area covered by the dotted Lorenz curve represents roughly 44% of the area of the triangle *OCD* for LDCs.

The changes in the distribution of income as measured by the Gini coefficient in relation to the increase in per capita income trace out the Kuznets inverted U-shaped curve K, as shown in Figure 2. “Note that the more robust portion of the Kuznets curve lies to the right: income inequality falls with an increase in

per capita income at higher levels of development. The variance around the estimated Kuznets curve is greatest, however, from low to middle levels of development."[3]

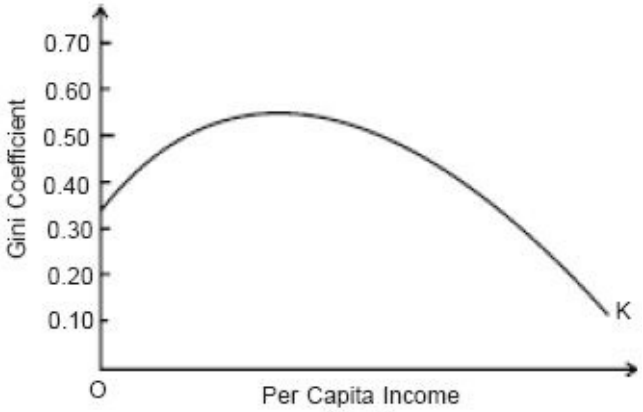

Fig. 2

The inverted U-shaped curve hypothesis applies to the present developed and developing countries but the degree of inequality in the latter is greater than in the former.

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1. Simon Kuznets, "Economic Growth and Income Inequality," *AER*, March 1955 and "Quantitative Aspects of the Economic Growth of Nations : Distribution of Income by Size." *Economic Development and Cultural Change*, January 1963.

2. The more unequal the distribution of income, the more will the Lorenz curve fall below the 45° line OD.

3. G.M. Meier, *op. cit.*, p 21.

CAUSES OF INCREASE IN INEQUALITY WITH DEVELOPMENT

There are many factors which tend to increase relative income inequality in the early stages of development in LDCs.

LDCs are characterized by geographic, social, financial and technological dualism. When the process of transition from a traditional agricultural society to modern industrial economy begins, it increases inequalities in income distribution. There are structural changes which lead to increasing employment opportunities, exploitation of new resources, and improvements in technology. All these lead to increase in per capita income in the industrial sector. The incomes of workers, managers, entepreneurs, etc. in urban areas increase more rapidly. But income per capita of workers engaged in agricultural and non-agricultural occupations in rural areas does not rise due to subsistence agriculture, defective land tenure system and rural backwardness.

The industrial sector uses capital-intensive techniques which absorbs only

educated, skilled and trained workers. Workers in this sector have high incomes and employers earn large profits. Thus the modern industrial sector grows faster than the rural subsistence sector. As a result, the relative share of income and profit in national income of this sector rises, more than in the rural sector.

The migration of rural population to urban areas does not provide gainful employment opportunities to the uneducated and unskilled people in towns and cities. The majority of them become vendors of fruits, vegetables, newspapers, etc., car washers, waiters, porters, shop assistants, domestic servants, etc. All such persons are underemployed and have low incomes.

When migration to urban areas starts in the early stages of development, some landlords also move to the urban sectors who invest in urban property, stocks, bonds, etc. Such investments bring them higher incomes than from landownership in rural areas.

On the other hand, with technological advance and increase in financial facilities in urban areas, a new class of entrepreneurs emerges which leads to diversification in manufacturing, trade and business. Consequently, incomes and profits of persons engaged in them increase.

There is urban bias in the allocation of financial resources for development on the part of governments with the result that the rural economy remains backward with disguised unemployment and low per capita income.

Governments in LDCs find it difficult to pass and implement legislation relating to land reforms and other economic measures to reduce concentration of income and wealth among the rich due to political reasons. Consequently, income inequalities increase.

Further, such governments are financially weak and are not in a position to spend on such social securities measures as free education, health facilities, etc. which reduce poverty and increase per capita income. They also do not impose heavy taxes on incomes and profits so as to increase saving, investment and capital formation.

Above all, higher growth rate of population among the masses in LDCs

increases the absolute number of people and hence relative inequality.

CAUSES OF REDUCTION IN INEQUALITY WITH DEVELOPMENT

Kuznets gives two reasons for the decrease in inequality of income distribution when the country reaches high income levels in the later stages of development. *First*, the per capita income of the highest income groups falls because their share of income from property decreases. *Second*, the per capita income of the lowest income groups rises when the government takes legislative decisions with respect to education and health services, inheritance and income taxation, social security, full employment and economic relief either to whole groups or individuals.

As development proceeds, it sets in motion a chain of cumulative expansion in the industrial sector, thereby leading to higher per capita income. This, in turn, increases the demand for farm products and other products of rural and backward areas which raise the per capita income of the people of these areas. This is what Hirchman calls *"trickling down effects"* and Myrdal calls *"spread effects"* of development.

Besides, the incomes of rural areas also increase from urban remittances and / or foreign remittances. People belonging to rural areas but working in urban areas and / or living in foreign countries remit large sums to their dependents.

Above all, as development gains momentum the growth rate of population declines which increases per capita income.

As pointed out by Montek S. Ahluwalia,[4] the improvement in income distribution observed in the later stages of development has been due to intersectoral shifts in the structure of production, expansion in educational attainment and skill of the labour force, and reduction in the rate of growth of population.

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4. M.S. Ahluwalia, "Inequality, Poverty and Development," *Journal of Development Economics*," Dec. 1963.

ITS CRITICAL APPRAISAL

Kuznets' inverted U-hypothesis has been empirically tested and confirmed by some economists while others find it the other way. Kravis[5] in his study of eleven developing and developed countries confirms the Kuznets hypothesis that the degree of inequality first increases at lower levels of development and the declines at higher levels of development. Adelman and Morris[6] in their study of 43 developing and 13 developed countries work out their average Gini coefficients as 0.47 and 0.29 respectively. They come to the conclusion that income inequality increases up to a certain level of development and then declines, thereby confirming the Kuznets inverted U-hypothesis. Similarly, Montek S. Ahluwalia in his analysis of the data for 60 countries finds that relative income inequality increases substantially in the early stages of development with reversal of this tendency in the later stages.

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5. I.B. Kravis, "International Differences in Distribution of Income, "*Review of Economic and Statistics*, Nov. 1960.

6. S. Adelman and C.T. Morris, *Economic Growth and Social Equity in Developing Countries*, 1973.

Despite these, the validity of the Kuznets inverted U-hypothesis has been questioned on the basis of the data taken by Kuznets and others for their studies. Kuznets takes a very small sample of developing and developed countries. Critics opine that his analysis is based on 5 per cent empirical information and 95 per cent speculation.

According to Todaro,[7] the long-run data for developed countries do seem to support the Kuznets hypothesis but the studies of the phenomenon in LDCs have produced conflicting results. His study of 13 LDCs shows that higher income levels can be accompanied by falling and not rising inequality." Todaro also finds fault with the methodology used by economists to test the Kuznets hypothesis. The time-series data being not available for most LDCs, economists use cross-sectional data. Using cross-sectional data for a time-series phenomenon for drawing conclusion is basically wrong. In a recent study, Anand and Kanbur[8] have shown that the choice of data as the measure of inequality may lead to U-relationship between income inequality and development, inverted-U relationship or no relationship at all.

7. M.P. Tadaro, *op. cit.*, p 166.

8. S. Anand and S.M.R. Kanbur, “The Kuznets Process and Inequality Development Relationship,” *Journal of Development Economics*, Feb., 1993.

CHAPTER

Sustainable Development

INTRODUCTION

The concept of sustainable development is of recent origin. The term "sustainable development" was first used by the *World Conservation Strategy* presented by the International Union for the Conservation of Nature and Natural Resources in 1980. It was commonly used and defined for the first time by the Brundtland Report, entitled *Our Common Future,* of the World Commission on Environment and Development in 1987.[1]

MEANING

There are many definitions of sustainable development. But the most popular definition is by the Brundtland Report. It defined sustainable development as "meeting the needs of the present generation without compromising the needs of future generations."

1. A few other sources are D.W. Pearce, E. Barbier and A. Markandaya, *Sustainable Development* , 1990; M. Redcliff, *Sustainable Development : Exploring the Contradictions* , 1987; *World Development Report* 1992, World Bank, 1992; D.W. Pearce and A. Markandeya, *The Benefits of Environmental Policy: Monetary Evaluation* , 1989.

Sustainable development means that development should "keep going". It emphasises the creation of sustainable improvement in the quality of life of all people through increases in real income per capita, improvements in education, health and general quality of life and improvements in quality of natural environmental resources. Thus sustainable development is closely linked to economic development. It is a situation in which economic development does not decrease over time. Sustainable development is development that is everlasting and contributes to the quality of life through improvements in natural environments. Natural environments, in turn, supply

utility to individuals, inputs to the economic process and services that support life. As pointed out by Pearce and Warford, “Sustainable development describes a process in which natural resource base is not allowed to deteriorate. It emphasises the hitherto unappreciated role of environmental quality and environmental inputs in the process of raising real income and the quality of life.”

OBJECTIVES OF SUSTAINABLE DEVELOPMENT

Sustainable development aims at the creation of sustainable improvements in the quality of life for all people as the principal goal of development policy. Accordingly sustainable development has many objectives. Besides increasing economic growth and meeting basic needs, the aim of lifting living standards includes a number of more specific goals such as “bettering people’s health and education opportunities, giving everyone the chance to participate in public life, helping to ensure a clean environment, promoting intergradational equity.” Thus meeting the needs of the people in the present generation is essential in order to sustain the needs of future generations.

Further, sustainable development aims at maximising the net benefits of economic development, subject to maintaining the stock of all environmental and natural resource assets (physical, human and natural) over time. In this context, economists distinguish between the concepts of *strong sustainability* and *weak sustainability.* Strong sustainability requires that the natural capital stock should not decrease. On the other hand, weak sustainability requires that the total value of physical, human and natural capital stock should not decrease. Pearce and others favour weak sustainability because increase in other capital stocks can substitute for decreases in the natural capital stock. Thus sustainable development in its weak form implies “that the rate of change of development over time is *generally* positive over some selected time horizon.”

To conclude, sustainable development aims at accelerating economic development in order to conserve and enhance the stock of environmental, human and physical capital without making future generations worse off.

ENVIRONMENTAL PROBLEMS

The environmental problems of a country depend on its stage of development, economic structure, production techniques in use and its environmental policies. For instance, the less developed countries face the problems of inadequate sanitation and clean drinking water due to lack of economic development while developed countries suffer from air and water pollution due to industrialisation.

The following are some of the environmental problems facing the less developed countries:

1. Air Pollution. Urbanisation which is the concomitant result of economic development and industrial growth has led to atmospheric pollution. Increasing vehicular traffic is the most important source of air pollution in big cities. Other reasons for this are two stroke engines, old vehicles, traffic congestions, bad roads and obsolete automotive technologies and lack of traffic management system.

The problem of *industrial pollution* is acute in areas where petroleum refineries, chemicals, iron and steel, non-metallic products, pulp and paper and textile industries are concentrated. Even small scale industries like foundries, chemical manufacturing and brick making are significantly air polluters. Another important source of air pollution is thermal power generation plants. People residing in shanty towns, slums and poorly ventilated houses and using household stoves, wood and coal for cooking further increase air pollution. Smoky indoor air mainly affects the health of women and children. Noise of vehicles, diesel generation sets, construction activities, loud speakers, etc. are other sources of atmospheric pollution in cities.

Thus air pollution is a serious problem in cities and urban manufacturing areas. There is particulate matter in the form of dirt, dust and solid waste thrown in the air that is harmful for humans, animals and plants. Acid rain on forests and water bodies destroys them in the long run. So are chemicals in gaseous form harmful. Some are directly poisonous such as carbon monoxide which is also produced by automobiles. Other gases damage the ozone layer of the atmosphere.

2. Water pollution. Water pollution is similarly a result of economic growth. The main sources of water pollution are flushing waste down the domestic

sewage, industrial effluents containing organic pollutants, and wastes of chemicals, heavy metals and mining activities. The major water polluting industries are refineries, fertilizers, pesticides, chemicals, leather pulp and paper, and metal plating. Sewage waste and industrial effluents flow into lakes, canals, rivers, coastal areas and underground water sources. Since they are untreated, they endanger aquatic resources like fish and other water creatures, and commercially important marine flora and fauna. The polluted and untreated water causes water borne diseases like diarrhoea, hepatitis, gastro-enteritis, trachoma, etc. Moreover, providing safe drinking water to people increases the costs of municipal corporations. Water shortages lead to inconveniences and retard economic activities.

3. Solid and Hazardous Wastes. Solid wastes also create air and water pollution in urban areas. Unregulated urban growth without such facilities as collection, transportation, treatment and disposal of solid wastes pollutes the atmosphere and water resources. Rotting garbage and blocked drains spread communicable diseases and pollute groundwater resources.

4. Deforestation. Deforestation also causes environmental problems. Deforestation leads to felling of trees and of natural plant growth for setting up industries, and building towns, roads, highways, dams, etc. This destroys flora and fauna. It leads to localised flooding in hilly and adjoining areas. There is loss of human and animal life. The green landscape changes into factories, residential and commercial buildings. They produce more heat, noise and pollution which bring environmental degradation and ultimately result in death of humans and cause of birth defects and genetic mutations. .

5. Soil Degradation. Another environmental problem is of soil degradation which is caused by water and wind. Soil erosion in hilly areas is caused by rain and rivers thereby leading to landslides and floods. Deforestation, overgrazing and step-farming in hilly areas further cause soil erosion. Floods in rivers in the plains cause soil erosion. Waterlogging on irrigated lands and intensive agriculture lead to salination and soil degradation. Areas in the proximity of deserts suffer from wind erosion caused by expansion of desert, dust storms, and whirlwinds. All types of soil degradation reduce soil fertility.

6. Loss of Biodiversity. Every country is endowed with unique phytogeographical and agro-ecological diversity comprising of a wide variety

of agro climate zones and plenty of plant and animal species. The biodiversity is found in forests, grasslands, mountains, wetlands, deserts and marine ecosystems. Economic growth leading to expansion of agriculture, reckless exploitation of forest and mineral wealth and development of projects in biodiversity areas has led to the destruction of habitats. Consequently, there has been extinction of plant, animal and microbiological species and loss of genetic resources.

CAUSES OF ENVIRONMENTAL DEGRADATION

Environmental degradation is caused by such diverse factors as population growth, poverty, rural development, urbanisation, etc. They are discussed as under:

1. Population Growth. Rapid population growth is a major cause of environmental degradation and rapid use of resources leads to increased pressure on the use of country's resources with the result that there is air and water pollution, loss of biodiversity and soil degradation. Rapid population growth depletes resources and threatens sustainable development. Thus rapid population growth and environmental degradation go hand in hand.

2. Poverty. Poverty is both the cause and effect of environmental degradation. Poverty encourages unsustainability because the poor use and deplete more natural resources than others because they have easy access to them. They work for sustenance on land and water and in mines and forests. On the other hand, degraded environment generates more poverty because the poor depend directly on natural resources for their livelihood.

3. Agricultural Development. Agricultural development in underdeveloped countries has been a major factor in environmental degradation. Intensive farming and excessive use of fertilizers and pesticides have led to over exploitation of land and water resources. These have led to land degradation in the form of soil erosion, water logging and salination.

4. Industrialisation. To industralise rapidly, underdeveloped countries are causing environmental degradation. The establishment of such industries as fertilizers, iron and steel, chemicals, refineries, etc. has led to land, air and water pollution. The use of fossil fuel, minerals and timber as sources of

industrial energy is depleting these natural resources and degrading natural eco-systems.

5. Transport Development. Underdeveloped countries are developing transport facilities for the expansion of trade and commerce. But they are also bringing about environmental degradation in the form of air pollution, noise pollution and sea pollution. The development of ports and harbours have led to oil spills from ships and adversely affected fisheries, coral reefs, mangroves and landscape.

6. Urbanisation. Rapid and unplanned urbanisation has led to degradation of urban environment. Slums and shanty towns pollute air and water and generation of solid and hazardous wastes have contributed to environmental degradation on a vast scale.

7. Foreign Indebtedness. Foreign indebtedness is another cause of environmental degradation in underdeveloped countries. In order to repay their debt, they produce commercial crops for export that displace subsistence crops which are subsequently grown on marginal lands. They also export minerals by exploiting them recklessly, thereby depleting them at a great cost to future generations.

8. Market Failure. An important cause of environmental degradation is market failure. It means poor functioning of markets for environmental goods and services. It reflects failure of government policy in removing market distortions created by price controls and subsidies. Market failure, also called externalities, is caused by lack of individual property rights and jointness in either production or consumption. For instance, individual farmers living in hilly areas cause soil degradation through deforestation and overgrazing of land that flood areas of people living in lower areas. Negative externalities (costs and adverse effects on people in lower areas) are not considered by the inhabitants of hilly areas. The effects of such environmental degradation are not controlled by market forces. Hence they reflect market failure.

POLICIES FOR SUSTAINABLE DEVELOPMENT

Agricultural and industrial development along with urbanisation and spread of infrastructure combined with population growth have led to environmental

degradation. Environmental degradation "harms human health, reduces economic productivity and leads to the loss of amenities". The damaging effects of economic development on environmental degradation can be reduced by a judicious choice of economic and environmental policies and environmental investments. Choice between policies and investments should aim at harmonising economic development with sustainable development. We discuss some policy measures as under:

1. Reducing Poverty. Such development projects should be started which provide greater employment opportunities to the poor. The government should expand health and family planning services and education so as to reach the poor that will help reduce population growth. Further, making investments in providing civic amenities like the supply of drinking water, sanitation facilities, alternate habitats in place of slums, etc. will not only improve welfare but also environment.

2. Removing Subsidies. To reduce environmental degradation at no net financial cost to the government, subsidies for resource use by the private and public sectors should be removed. Subsidies on the use of electricity, fertilisers, pesticides, diesel, patrol, gas, irrigation water, etc. lead to their wasteful use and environmental problems. Subsidies to capital intensive and highly polluting private and public industries lead to environmental degradation. Removing or reducing subsidies will bring both economic and environmental benefits to the country.

3. Clarifying and Extending Property Rights. Lack of property rights over excessive use of resources leads to degradation of environment. This leads to overgrazing of common or public lands, deforestation, and overexploitation of minerals, fish, etc. Clarifying and assigning ownership titles and tenurial rights to private owners will solve environmental problems. Places where the use of common lands, forests, irrigation systems, fisheries, etc. is regulated and rules for their proper use are laid down by the community, the ownership rights should be clearly specified in the administrative records.

4. Market Based Approaches. Besides regulatory measures, there is urgent need for adopting market based approaches for the protection of environment. They aim at pointing to consumers and industries about the cost of using natural resources on environment. These costs are reflected in the prices paid

for goods and services so that industries and ultimately the consumers are guided by them to reduce air and water pollution.

The Market Based Instruments (MBIs) approach is used in both developed and developing countries. MBIs are of two types: quantity based and price based. They are in the form of environmental taxes that include "pollution charges (emission tax/pollution taxes), marketable permits, depositor fund system, input taxes/product charges, differential tax rates and user administrative charges and subsidies for pollution abatement equipment for air and water resources."

5. Regulatory Policies. Regulatory policies also help in reducing environmental degradation. Regulators have to make decisions regarding price, quantity and technology. In making decisions, they have to choose between the quantity or the price of pollution or resource use or technologies. The regulating authority has also to decide whether policies should target the environmental problem directly or indirectly. It lays down technical standards and regulations and charges on air, water and land pollutants. Regulators should be impartial in applying environmental standards to both public and private sector polluters or resource users.

6. Economic Incentives. Like regulatory policies, economic incentives relate to price, quantity and technology. Incentives are usually in the form of variable fees to resource users for the quantity of pollutants in air, water and land use. They are given rebates if less waste or pollution is generated than the emission standards laid down.

7. Trade Policy. Trade policy in relation to environment has two implications: *first* , concerning domestic policy reforms; and *second* , relating to international trade policy. Domestic trade policy emphasises on the establishment of less polluting industries away from the cities and the use of environmental friendly processes for polluting industries by adopting cleaner technologies. As regards the relation between international trade and environmental quality is concerned, controversy has been going on as to whether liberalised trade causes environmenal degradation. The controversy leads to the conclusion that "overall, trade liberalisation is likely to produce negative environmental externalities, but also some environmental gains." The former does not imply that free trade should be stopped. Rather, such cost-

effective policies should be adopted that optimize externalities. Environmental degradation from free trade should be reduced by strict domestic policy measures based on the "polluter pays principle". It is better to insist on the foreign company to transfer clear technology and assist in cleaning the environment for existing industries.

8. Public Participation. Public awareness and participation are highly effective to improve environmental conditions. Conducting of formal and informal education programmes relating to environment management and environmental awareness programmes can go a long way in controlling environmental degradation and keeping the environment clean. For instance, the scheme of eco-labelling of products helps consumers to identify products that are environment friendly.

In Japan, there are consumer co-operatives that popularise green products which are recyclable, biodegradable, rechargeable, onzone friendly and unleaded. As a further step, firms, industries and other establishments in some countries have to disclose in their Annual Reports the extent to which they are adopting environmental friendly measures.

Public participation can also render costless and useful assistance in afforestation, conservation of wildlife, management of parks, improvements of sanitation and drainage systems and flood control. Use of indigenous institutions and local voluntary organisations can render much help in educating the masses about the harmful effects of environmental degradation and the benefits of keeping the environment clean.

9. Participation in Global Environmental Efforts. There are many international conventions and agreements on environmental protection and conservation which every country is expected to follow. They include the *Montreal Protocol* regarding the phasing out of ozone-depleting chemicals. The *Basel Convention* which relates to the control of the transboundary movement and disposal of hazardous wastes. Among others, there is the *Rio Declaration on Environment and Development* and the *Agenda 21* which is the operational programme for sustainable development. Then, there are the *GATT Clauses on Environment* . Not all countries are signatories to the various agreements and conventions. There is threat of trade sanctions against countries that do not honour agreements relating to biodiversity protection or

greenhouse gas emissions but many countries do not adhere to them.

MEASURING SUSTAINABLE DEVELOPMENT

Measuring sustainable development is a difficult task which involves the valuation of environmental damage and comparing it with the costs of preventing it. There are also the problems of measuring the capital stock needed for sustainable development, of natural resource accounting, and the use of an appropriate discount rate for maintaining an optional balance between the use and preservation of natural resources. We discuss a few methods and their implications on sustainable development.

1. Measuring Natural Capital Stock. The stock of natural resource assets or of environmental assets includes "soil fertility, forests, fisheries, the capacity to assimilate waste, oil, gas, coal, the ozone layer and biogeochemical cycles." The necessary condition for sustainable development is that the natural capital stock should be conserved and improved. This is interpreted to mean that the natural capital stock should remain at least constant. This can be measured in terms of the cost-benefit analysis of changes in the natural capital stock. If it is reduced, say in terms of clearing forests for cultivating land or for habitation, etc., there will be benefits in terms of the use of the land for more productive purposes. Similarly, when the atmosphere is kept clean, it is a benefit and the damage of polluted environment is a cost. So sustainability is consistent with maintaining and improving natural capital assets.

Some economists do not agree that more importance should be attached to natural capital than to man-made capital and human capital. According to them, sustainable development relates to the conservation and improvement of the overall capital stock comprising natural, man -made and human capital. This view is consistent with efficiency and intergenerational equity. Taking the overall capital stock means that natural and man-made capital can be substituted for each other. This can be done on the basis of social rate of return. This presumes that if a natural capital asset is being depleted, the proceeds from this are invested on man-made capital in order to obtain a high rate of return. But this seldom happens because the proceeds from environmental degradation are consumed and not invested. Another problem is of valuation of the proceeds from natural capital and their investment on man-made capital.

It is not possible to evaluate the environmental damage correctly on the basis of market prices. The use of shadow prices is not an accurate measure of environmental services.

2. Natural Resource or Green Accounting. Another measure of sustainable development is green accounting. It permits the computation of income for a nation by taking into account the economic damage and depletion in the natural resource base of an economy. It is a measure of sustainable income level that can be secured without decreasing the stock of natural assets. This requires the adjustment of the system of national income accounts in terms of stock of natural assets. The computation of gross national product (GNP) would be replaced by a measure of national output that includes the economic cost of degrading natural resources which are required to produce goods and services directly and indirectly. Thus GNP would include the stocks of natural assets and the measure of sustainable can be NNP = GNP - D_N where D_N is depreciation of the monetary value of natural assets during the year. But the computation of such a measure of sustainable income is a complex matter, particularly the computation of monetary valuation of non-marketed natural assets and externalities. Thus green accounting would require numerous and controversial computations and valuations.

3. Measuring Environmental Values. Another problem of measuring environmental damage is to evaluate it and compare it with the cost of preventing it. It concerns comparing the benefits of environmental protection with the costs incurred on it. In this connection, several indicators are being computed by economists. *World Development Report 1992* suggests the following four approaches for economic valuation of environmental damage:

(1) *Market Prices.* When there are adverse health effects and loss In productivity due to environmental damage, market prices are to evaluate them. The procedure is to evaluate damages due to soil erosion, deforestation, and air and water pollution. For this purpose, the ecological relationship between environmental damage and its effects on production or health are estimated on the basis of prices to derive monetary values. Welfare losses relating to health risks due to polluted environment are measured by income foregone because of illness or premature death. Such estimates are difficult to compute because they rely on loss in income.

(2) *Costs of Replacement*. People and firms invest in installing alternate devices to avert environmental damage of air, water and land. Such investments can provide an estimate of environmental damage. But the effects of damages cannot be evaluated.

(3) *Surrogate Markets*. The effects of environmental damages on other markets like property values and wages of workers are also evaluated. Valuation in the case of property is based on risks involved in evaluating the value of property due to environmental damage. Similarly, jobs with high environmental risks will have high wages which will include larger risk premiums. But this technique is impracticable because property owners and workers are ignorant of the effects of environmental damages.

(4) *Surveys*. Surveys relating to the effects of environmental damage and effects to improve environment are being used in developing countries to determine the amenity value of species or landmarks.

4. Social Discount Rate. Environmental degradation leads to costs and environmental improvements confer benefits on resource users. The problem is how to measure costs and benefits of environmental effects on the present and the future generations. For this, a rate of discount is needed for discounting all costs and benefits. But there is lot of confusion and differences among economists in discounting environmental costs and benefits on the following grounds:

Critics do not favour discounting in general and high discount rates in particular. According to them, there is no unique relationship between high discount rates and environmental degradation. When discount rates are high, the level of investment falls which discourages development projects and slows down the pace of development. It thus shifts the burden of high costs to future generations. Even demand declines for resources on which investments are to be made.

But the main problem is how to choose a social discount rate. This cannot be the market rate of interest because of uncertainties and imperfections of capital markets. Therefore, the majority of economists measure the social rate of discount at government's borrowing rates on long-term securities because they are riskless. But there are numerous borrowing rates on government securities

relating to different time periods. The problem is which rate to choose as the social discount rate.

Many economists, therefore, favour social rate of time preference and opportunity cost of capital in measuring the cost and benefit of environmental degradation. But like the social discount rate, they have their problems of measurement and the effects on environmental degradation on the present and future generations are unclear.

Thus no acceptable method has been evolved to measure sustainable development in a proper way.

CHAPTER

Characteristics of An Underdeveloped Country

Before we study the characteristics of an underdeveloped country, it is essential to understand the meaning of the term 'underdeveloped' and the criteria of underdevelopment.

MEANING OF THE TERM 'UNDERDEVELOPED'

The term 'underdeveloped' has been used in a variety of ways. 'Undeveloped' and 'under developed' countries are often used as synonyms. But these two terms are easily distinguishable. An underdeveloped country is one which has no *prospects* of development. An underdeveloped country, on the other hand, is one which has no *potentialities* of development. The Antarctic, the Arctic and parts of the Sahara may be termed as undeveloped, while India, Pakistan, Uganda, Columbia, Panama, etc. may be called underdeveloped. "Poor" and "backward" are also used as synonyms for "underdeveloped". A poor country does not mean a young country. Poverty simply refers to the low level of per capita income of a country. It has nothing to do with the country's culture. 'Backward countries' is a static term like the term 'underdeveloped'. So the terms 'poor' and 'underdeveloped' are interchangeable. A more respectable term "developing countries" has also come to be used in economic literature. However, Bauer regards the expressions underdeveloped, developing and less developed as clearly euphemisms. The terms underdeveloped and developing are especially inappropriate euphemisms: *underdeveloped* because it so clearly suggests that the condition it describes is abnormal, reprehensible and also perhaps readily rectifiable. The term *developing* because its use leads to such contradictions as references to the stagnation or retrogression of the developing world. According to him *poor* or *materially backward* are the most appropriate expressions.[1] The World Bank uses the term developing countries and divides them into low income and middle income countries. Middle

income countries are further divided into lower-middle-income and upper-middle countries. Of late, a new term *Third World*[2] is being used. We shall be using all these terms interchangeably throughout the text.

DIFFERENT CRITERIA OF UNDERDEVELOPMENT

It is rather difficult to give a precise criterion of underdevelopment. Underdevelopment can be defined in many ways: by the *incidence* of poverty, ignorance, or disease; by *maldistribution* of the national income; by administrative incompetence, by social *disorganization*.[3] There is thus not a single definition which is so comprehensive as to incorporate all the features of an underdeveloped country. Still some of the criteria of underdevelopment are discussed below:

1. The first criterion of underdevelopment is the *ratio of population to land area*. But it is very difficult to ascertain whether a high or a low ratio of population to area is an indicator of underdevelopment. There are many underdeveloped countries in Africa and Latin America where there are "empty spaces" signifying a low ratio. While there are a number of other underdeveloped countries like India, China, Myanmar, Pakistan, Malaysia and many other South Asian countries which have a high ratio of population to area. This criterion is, therefore, vague and superfluous.

2. Another indicator of underdevelopment is the ratio of industrial output to total output. It may also be explained as the ratio of industrial population to total population. According to this criterion, countries with a low ratio of industrial output to total output are considered underdeveloped. But this ratio tends to increase with the increase in per capita income. Therefore, the degree of industrialization is often a consequence rather than a cause of economic prosperity in a country. In countries where agriculture is developed, tertiary or service industries tend to grow spontaneously because increasing disposable agricultural surplus creates demand for the products of the industrial sector. But when the disposable surplus agricultural income is used to subsidize uneconomic urban industry, the overall per capita income would tend to be lower.[4] Thus, this criterion is not a valid indicator of underdevelopment.

3. The third criterion of underdevelopment is the *low ratio of capital to per*

head of population. Nurkse defines underdeveloped countries as those which "compared with the advanced countries are underequipped with capital in relation to their population and natural resources".[5] But dearth of capital is not a satisfactory criterion of underdevelopment for the following reasons:

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1. P.T. Bauer. *Dissent on Development.* 1973.

2. The African, the Asian and the Latin American member countries of the United Nations prefer to call *themselves collectively as the* 'Third World'. *They do so to distinguish* themselves from the economically advanced capitalist countries of the 'First World' and the socialist countries of the 'Second World'.

3. Hugh L. Keenleyside. "Obstacles and Means in International Development" in *Dynamics of Development,* (ed.) G. Hambidge, p. 8.

4. J. Viner. "The Economics of Development" in *The Economics of Underdevelopment* (ed.) A.N: Aggarwal and S.P. Singh, pp. 11-12.

5. Op. *cit.,* p. 1.

(a) Capital deficiency is not related to absolute size of a country's stock of capital but to the ratio of capital to population or to some other factor.

(b) The Principle of Marginal Productivity tells that where the ratio of capital to other factors is low, the marginal productivity of capital is high. But it is difficult to infer from this that in underdeveloped countries marginal productivity of capital is high since capital is scarce, or that a high marginal productivity of capital suggests a scarcity of capital. It is possible that poor organisation, low skills, unfavourable weather, etc. may tend to keep the marginal productivity of capital low in underdeveloped countries,

(c) Moreover, if capital deficiency is taken as an indicator of underdevelopment, other socio-economic factors are neglected. As Nurkse himself says, "Economic development has much to do with human endowments, social attitudes, political conditions and historical accidents. Capital is a necessary but not a sufficient condition of progress."

4. Another criterion indicates towards *poverty as* the main cause of underdevelopment. Staley defines an underdeveloped country as one "characterised by mass poverty which is chronic and not the result of some temporary misfortune and by obsolete methods of production and social

organisation, which means that the poverty is not entirely due to poor natural resources and hence could presumably be lessened by methods already proved in other countries".[6]

This definition points towards some of the important characteristics of underdeveloped countries. That underdeveloped countries have unexploited natural resources, scarcity of capital goods and equipment, obsolete techniques of production and defects in socio-economic organisation, none can deny. But it does not lay emphasis on the basic criterion of underdevelopment, *viz.*, low per capita income. As Barbara Ward says, "Perhaps the most satisfactory method of defining poverty is to discuss the question simply in terms of per capita income—the average income available to citizens in various countries."[7]

5. Thus one of the most commonly acceptable criteria of underdevelopment is the *low per capita real income* of underdeveloped countries as compared with the advanced countries. According to the United Nations experts, "We use it (the term underdeveloped country) to mean countries in which per capita real income is low when compared with the per capita real income of the United States of America, Canada, Australia and Western Europe." But such definitions, which explain an underdeveloped country in terms of the low per capita level of income, can by no means be considered adequate and satisfactory. For they focus attention only on one aspect of underdevelopment, *viz.*, *poverty*. They do not analyse the causes of low consumption levels, of inhibited growth and of the development potential of an underdeveloped economy. Moreover, "being under-developed in the technical sense means nothing in terms of the level of civilization, culture or spiritual values".[8] Serious difficulties also arise while measuring per capita national income in underdeveloped countries and their comparison with the per capita income of the advanced countries. The data on per capita national income is often inaccurate, misleading and unreliable due to the following reasons:

(a) There is a substantial non-monetized sector in underdeveloped countries which makes the calculation of national income difficult. A great deal of what is produced in the subsistence sector is either exchanged for other goods or is kept for personal consumption. This tends to understate the national income.

6. E. Staley, *The Future of Underdeveloped Countries,* p. 13.

7. *The Rich and Poor Nations.*

8. B. Higgins. *Economic Development,* p. 7

(b) There is lack of occupational specialization in such countries which makes the calculation of national income by distributive shares or by industrial origin difficult. Besides the crop, farmers often produce a variety of products like eggs, milk, articles of clothing, etc. that are never included in the national income estimates.

(c) In underdeveloped countries people are mostly illiterate and do not keep any accounts, and even if they do, they are reluctant to disclose their income correctly. In such a situation only rough estimates are possible.

(d) National income estimates include only those goods and services which are commercially used. But in underdeveloped countries people living in rural areas and manufacturing articles of consumption from rudimentary goods are able to avoid many expenses. They build their own huts, garments and other necessities. Thus in underdeveloped countries, relatively fewer goods are channelised through the market, and therefore are not included in the national income estimates.

(e) The computation of national income in terms of money underestimates the real income. It does not include the real cost of producing an article, the effort or sacrifice of leisure *forgone* in the process of production. The income earned by two persons may be the same, but if one works for longer hours than the other, there is some justification in saying that the real income of the *former* is underestimated.

(*f*) National income estimates fail to measure adequately changes in output due to changes in the price level. Index numbers used to measure changes in the price level are simply rough approximations. Moreover, the price levels vary in different countries. Consumers' wants and preferences also differ in each country. Therefore, the national income figures of different countries are often misleading and incomparable.

(g) International comparisons of national income are inaccurate due to exchange rate conversion of different currencies into a common currency, *i.e.*,

US dollar. The use of a single currency unit for computing the total output of goods and services underestimates the national incomes of underdeveloped countries as compared with the developed ones. The rates of exchange are primarily based on the prices of internationally traded goods. But there are many goods and services in underdeveloped countries that are never traded internationally and are also priced low. "It is contended that approximately correct results can be obtained only when there exists an equivalence between the prevailing exchange rates and the relationship of internal prices. The equivalence is unlikely to be achieved for most countries today in view of the prevalent use of exchange control and quantitative restrictions on trade." This makes international comparisons of national incomes misleading and superfluous.

(h) The calculation of per capita income in an underdeveloped country is likely to be understated or overstated due to unreliable and erroneous population figures. The census data is never accurate in such countries.

(*i*) Above all, difficulties arise in the definition of income, in the differences in concepts used for the computation of national income in various countries and calculating the contribution to national income of such governmental activities as irrigation and power projects, police and military services etc.

Despite these limitations, per capita income is the most widely used indicator of the level of underdevelopment.

CHARACTERISTICS OF AN UNDERDEVELOPED COUNTRY

In order to examine the problems of an underdeveloped country, it is useful to have in mind a general sketch of the economy of such a country. Though it is difficult to locate a representative underdeveloped country on the world map, yet it is possible to focus attention on some of its characteristics.

GENERAL POVERTY

An underdeveloped country is poverty-ridden. Poverty is reflected in low GNP per capita. According to the *World Development Report, 1999-2000,* 59.6 per cent of the world population in 1998 living in low-income economies had GNP per capita of $ 760 or less; 25.4 per cent in middle income economies

had $ 761 to $ 9,360; and 15.0 per cent in high-income economies had $ 9,361 or more. The extremely low GNP per capita of low-income economies reflects the extent of poverty in them.

Further, the *World Bank Report* pointed out vast income disparities among nations. Among the low-income countries were Nepal and Tanzania with GNP per capita of $ 210, Nigeria $ 300, Uganda $ 320, Zambia $ 330, Bangladesh $ 350, Ghana $ 390, India $ 430, Pakistan $ 480, Zimbabwe $ 610, Indonesia $ 680 and China $ 750. Some of the middle-income group countries were Sri Lanka with GNP per capita of $ 810, Philippines $ 1,050, Kenya $ 1310, Namibia $ 1,940, Russian Federation $ 2,300, South Africa $ 2880, and Malaysia $ 3,600. Of the high-income countries, Luxembourg led with GNP per capita of $ 43,570, followed by Switzerland $ 40,080, Norway $ 34,330, Denmark $ 33,260, Japan $ 32,380, Singapore $ 30,060, United States $ 29,340 and so on.

However, it is not relative poverty but absolute poverty that is more important in assessing such economies. Absolute poverty is measured not only by low income but also by malnutrition, poor health, clothing, shelter, and lack of education. Thus absolute poverty is reflected in low living standards of the people. In such countries, food is the major item of consumption and about 80 per cent of the income is spent on it as compared with 20 per cent in advanced countries. People mostly take cereals and other starches to the total absence of nutritional foods, such as meat, eggs, fish, and dairy products. For instance, the per capita consumption of protein in LDCs is 52 grams per day as compared with 105 grams in developed countries. The per capita fat consumption in LDCs is 83 grams daily as against 133 grams in developed countries. As a result, the average daily calorie intake per capita hardly exceeds 2,000 in underdeveloped countries as compared with more than 3,300 to be found in the diets of the people of advanced countries.

The rest of the consumption of such countries consists mainly of a thatched hut and almost negligible clothing. People live in extremely insanitary conditions. More than 1,200 million people in the developing countries do not have safe drinking water and more than 1,400 million have no sanitary waste disposal. Of every 10 children born, two die with in a year, another three die before the age of five, and only five survive to the age of 40 years. The reasons are poor nutrition, unsafe water, poor sanitation, uninformed parents and lack of

immunisation. Services like education and health hardly flourish. Recent data reveal that there is a doctor for 2,083 persons in India, for 5,555 persons in Bangladesh, for 20,000 persons in Nepal, and for 870 persons in China, as against 410 persons for the developed countries. Most developed countries are expanding educational facilities rapidly. Still such efforts fall short of the manpower requirements of these economies. In many low-income countries about 70 per cent of the primary school age children go to school, at the secondary level, enrolment rates are lower than 20 per cent and enrolment in higher education hardly comes up to 3 per cent. Moreover, the type of education being imparted to the majority of the school and college-going children is ill-suited to the development needs of such countries. Thus the vast majority of the people in LDCs are ill-fed, ill-clothed, ill-housed and ill-educated. The number of people in absolute poverty in LDCs, excluding China, is estimated at about 1,000 million. Half of them live in South Asia, mainly in India and Bangladesh; a sixth live in East and Southeast Asia, mainly in Indonesia; another sixth in Sub-Saharan Africa; and the rest in Latin America, North Africa and the Middle East. Poverty is, therefore, the basic malady of an underdeveloped country which is involved in 'misery-go-round'. Prof. Cairncross is justified in saying that the underdeveloped countries are the slums of the world economy.[9]

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9. A.K. Cairncross, *Factors in Economic Development,* p. 15.

AGRICULTURE, THE MAIN OCCUPATION

In underdeveloped countries two-thirds or more of the people live in rural areas and their main occupation is agriculture. There are four times as many people occupied in agriculture in some underdeveloped countries as there are in advanced countries. In low-income countries like China, Kenya, Myanmar and Vietnam, more than 71 per cent of the population is engaged in agriculture while the percentages for the United States, Canada and West Germany is 3, 3 and 4 respectively. This heavy concentration in agriculture is a symptom of poverty. Agriculture, as the main occupation, is mostly unproductive. It is carried on in an old fashion with obsolete and outdated methods of production. The average land holdings are as low as 1 to 3 hectares which usually support 10 to 15 people per hectare. As a result, the yield from land is precariously

low and the peasants continue to live at a bare subsistence level.

Such countries mainly specialize in the production of raw materials and foodstuffs, yet some also specialize in non-agricultural primary production, *i.e.,* minerals. For example, Sri Lanka specializes in tea, rubber and coconut products; Malaysia in rubber, tin and palm oil; Indonesia in rubber, oil and tin; Pakistan in cotton; Bangladesh in jute; India in tea; and Brazil in coffee. An underdeveloped country is thus a *primary* sector economy. Besides the primary sector there is the underdeveloped *secondary* sector with a few simple, light and small consumer goods industries and an equally underdeveloped *tertiary* sector, *i.e.,* transport, commerce, banking and insurance services. In some of the low-income countries such as Bangladesh, Ethiopia, Nepal, Uganda, Ghana and Tanzania the share of agriculture in GDP continues to be more than 40 per cent and the share of industry and manufacturing less than 20 per cent.

A DUALISTIC ECONOMY

Almost all underdeveloped countries have a dualistic economy. One is the market economy, the other is the subsistence economy. One is in and near the towns, the other is in the rural areas. One is developed, the other is less developed. Centred in the towns, the market economy is ultra-modern with all the amenities of life, *viz.,* the television, the car, the bus, the train, the telephone, the picture house, the palatial buildings, the schools and the colleges. Here too government, offices, the business houses, the banks and a few factories are visible. The subsistence economy is backward and is mainly agriculture-oriented.

Dualism is also characterised by the existence of an advanced industrial system and an indigenous backward agricultural system. The industrial sector uses capital-intensive techniques and produces a variety of capital goods and durable consumer goods. The rural sector is engaged in producing agricultural commodities with traditional techniques. Both perpetuate unemployment and disguised unemployment. There is also financial dualism consisting of the unorganised money market charging very high interest rates on loans and the unorganised money market with low interest rates and abundant credit facilities. This aggravates economic dualism between the traditional sector and the modern industrial sector.

In many underdeveloped countries, there are foreign-directed enclaves thus making a triplistic economy. They are highly capitalistic and are found in petroleum, mining and plantations. The native hired labour working in these plantations and mines spends a considerable part of its wages on imported consumer goods. The standard of living of the workers working there differs from that of their brethren living in the subsistence sector.

The dualistic or triplistic nature of the economy is not conducive to healthy economic progress. The primary sector inhibits the growth of the secondary and the tertiary sectors by putting a limit on their expansion and development.

UNDERDEVELOPED NATURAL RESOURCES

The natural resources of an underdeveloped country are underdeveloped in the sense that they are either unutilized or underutilized or misutilized. A country may be deficient in natural resources, but it cannot be so in the absolute sense. Although a country may be poor in resources, it is just possible that in the future it may become rich in resources as a result of the discovery of presently unknown resources or because new uses may be found for the known resources. Thus, instead of saying that underdeveloped countries are absolutely deficient in natural resources, it is more appropriate to say that they have not been successful in overcoming the scarcity of natural resources by appropriate changes in technology and social and economic organization.[10] Generally speaking, they are not deficient in land, mineral, water, forest or power resources. Africa possesses considerable reserves of copper, tin, bauxite, and gold; Asia is rich in petroleum, iron, bauxite, manganese, mica and tin; and Latin America's reserves of petroleum, iron, zinc, and copper are immense. The forest wealth of Africa and South America still remains unpenetrated and unexplored. Thus underdeveloped countries do possess resources but they remain unutilized, underutilized or misutilized due to various inhibitions such as their inaccessibility, lack of technical knowledge, non-availability of capital and the small extent of the market.

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10. G.M. Meier and E. Baldwin, *Economic Development,* pp. 291-92.

DEMOGRAPHIC FEATURES

Underdeveloped countries differ greatly in demographic position and trends. Diversity exists in the size, density, age-structure and the rate of growth of population. But there appears to be one common feature, a rapidly increasing population which adds a substantial number to the total population every year. With their low per capita income and low rate of capital formation, it becomes difficult for such countries to support this additional number. And when output increases due to improved technology and capital formation, it is swallowed up by increased population. As a result, there is no marked improvement in the living standards of the masses. Warning about the increase in numbers, **Keenleyside** writes: "The womb is slower than the bomb but it may prove just as deadly. Suffocation rather than incineration may mark the end of the human story."[11]

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11. H.L. Keenleyside, in *Dynamics of Development,* (ed.) G. Hambidge, p. 9.

Almost all the underdeveloped countries possess high population growth potential characterized by high birth-rate and high but declining death-rate. The advancement made by medical science has resulted in the discovery of marvellous drugs and the introduction of better methods of public health and sanitation which have reduced mortality and increased fertility. Declining death-rates and increasing birth-rates give a very high natural growth rate of population. The average annual growth rate of population in developing countries is 2 per cent as compared with about 0.7 per cent in developed countries. This rapid increase in numbers aggravates the shortage of capital in such economies because large investments are required to be made to equip the growing labour force even with obsolete equipment.

An important consequence of high birth-rate is that a larger proportion of the total population is in younger age group. The percentage of population under 15 years of age is about 40 in developing countries, compared with only 20 to 25 per cent in developed countries. Moreover, 90 per cent of the dependents are children in LDCs whereas their percentage is only 66 in developed countries. A large percentage of children in the population entails a heavy burden on the economy which implies a large number of dependents who do not produce at all but do consume. With many dependents to support, it becomes difficult for the workers to save for the purposes of investment in capital equipment. It is also a problem for them to provide, their children with

the education and bare necessities of life that are essential for the country's economic and social progress in the long run.

Underdeveloped countries have also a shorter life expectancy which means that a smaller fraction of their population is available as an effective labour force. Average life expectancy at birth is roughly 51 years in low income countries whereas in the developed countries it is 75 years. Low life expectancy means that there are more children to support and few adults to provide for them which inhibits the rate of economic growth.

Lastly, in the majority of underdeveloped countries, the density of agricultural population is very high in relation to the area of cultivated land. In Egypt, in the inhabited area of the valley of the Nile, the density of population is 600 persons per sq. km. Though in other underdeveloped countries it is much less, yet their density is increasing rapidly with the growth of population. The problem is becoming serious in the river deltas of Asia and Africa and in the densely populated islands of Malaysia, Indonesia, and Sri Lanka. Shortage of land in relation to an excessively large agricultural population leads to overcrowding, over-cropping and soil exhaustion, thereby impeding economic progress.

UNEMPLOYMENT AND DISGUISED UNEMPLOYMENT

In underdeveloped countries there is vast open unemployment and disguised unemployment. The unemployment is spreading with urbanisation and the spread of education. But the industrial sector has failed to expand alongwith the growth of labour force thereby increasing urban unemployment. Then there are the educated unemployed who fail to get jobs due to structural rigidities and lack of manpower planning. With the present average annual growth rate of 4.5 per cent in urban population, 20 per cent of the labour force in urban areas is unemployed.

But underemployment or disguised or concealed unemployment, is a notable feature of underdeveloped countries. Such unemployment is not voluntary but involuntary. People are prepared to work but they are unable to find work throughout the year due to lack of complementary factors. Such unemployment is found among rural landless and small farmers due to the seasonal nature of farm operations and inefficient labour and equipment to keep them fully

employed. A person is said to be disguised unemployed if his contribution to output is less than what he can produce by working for normal hours per day. His marginal productivity is nil or negligible, and by withdrawing such labourers, farm output can be increased. Disguised unemployment is explained in Fig. 1 where *TP* is the total production curve. When OL_1 labourers are employed on a farm, total production is OQ1. With the employment of more labourers OL_2, production increases to OQ_2. But by employing more labourers OL_2, production does not increase at all. It remains constant at OQ_2. The marginal productivity of labour becomes nil when more labourers are employed beyond OL_2. Thus L_2L_3 labourers are disguised unemployed on this farm. In the 1950s, economists estimated the number of disguised unemployed at 25-30 per cent of rural labour force. Now it is agreed that it does not exceed 5 per cent, even though precise estimates are not available.

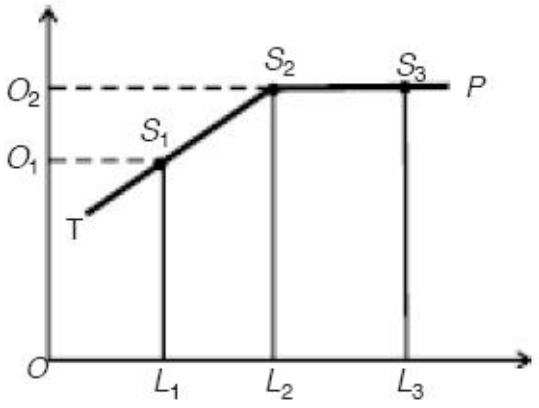

Fig. 1

There are also other types of underemployed persons in such countries. A person is considered to be underemployed if he "is forced by unemployment to take a job that he thinks is not adequate for his purpose, or not commensurate with his training." Further, there are those who work full time in terms of hours per day but earn very little to rise above the poverty level. They are hawkers, petty traders, workers in hotels and restaurants and in repair shops, etc., in urban areas. Open and disguised unemployed in urban and rural areas are estimated at 30-35 per cent of the labour force in LDCs.

ECONOMIC BACKWARDNESS

In underdeveloped countries particular manifestations of economic backwardness are low labour efficiency, factor immobility, limited specialization in occupation and in trade, economic ignorance, values and social structure that minimize the incentives for economic change.[12]

12. Meier and Baldwin, *op. cit.*, p. 293.

The basic cause of backwardness is to be found in low labour productivity as compared with the developed countries. This low labour efficiency results from general poverty which is reflected in low nutritional standards, ill health, illiteracy and lack of training and occupational mobility, etc.

There is also occupational immobility of labour due to the joint family system and the caste system. Certain cultural and psychological factors are more dominant than wage rates in determining the supply of labour. The joint family system makes people lethargic and stay-at-home. In many underdeveloped countries, certain occupations are reserved for members of some particular caste, religion, race, tribe or sex. In Latin America, cloth making falls within the exclusive jurisdiction of women. In India, a janitor always belongs to a particular caste. According to Stephen. Enke, "underdeveloped countries have what might be termed an uneconomic culture. Primarily, this means that traditional attitudes discourage the full utilization of human resources. More specifically, it means that men are less likely to strive for extra-consumption." In underdeveloped countries people are mostly illiterate, ignorant, conservative, superstitious and fatalists. Poverty in such countries is abysmal, but it is considered to be God-given, something preordained. It is -never attributed to personal lack of thrift and industry.

There is extensive prevalence of child labour and women's status and position in society is inferior to men. Dignity of labour is conspicuously absent. Government jobs, even of a clerical nature, have more prestige than manual work. People are ranked not according to their capacity to do a particular job but by age, sex, caste, clan and kinship. They are governed by customs and traditions. Individualistic spirit is absent. Exchange by barter is widespread and money economy is hardly understood. "The value system minimizes the importance of economic incentives, material rewards, independence and rational calculation. It inhibits the development and acceptance of new ideas and objectives and fails to compare the costs and advantages of alternative methods to achieve objectives. In short, the cultural value system within many poor countries is not favourable to economic achievement and the people remain economically backward."[13]

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13. Ibid., *pp. 298-99.*

LACK OF ENTERPRISE AND INITIATIVE

Another characteristic feature of underdeveloped countries is the lack of entrepreneurial ability. Entrepreneurship is inhibited by the social system which denies opportunities for creative faculties. “The force of custom, the rigidity of status and the distrust of new ideas and of the exercise of intellectual curiosity, combine to create an atmosphere inimical to experiment and innovation.” The small size of the market, lack of capital, absence of private property, absence of freedom of contract and of law and order hamper enterprise and initiative.

Besides, there exist a few entrepreneurs who are engaged in the manufacture of some consumer goods, and in plantations and mines that tend to become monopolistic and quasi-monopolistic. They develop personal and political contacts with the government officials, enjoy a privileged position, and receive preferential treatment in finance, taxation, exports, imports, etc. It is they who start new industries and thus founded individual business empires which inhibit the growth of fresh entrepreneurship within the country.

The thin supply of entrepreneurs in such countries is also attributed to the lack of infrastructural facilities which add to the risk and uncertainty of new ertrepreneurship. LDCs lack in properly developed means of transport and communications, cheap and regular power supply, availability of sufficient raw materials, trained labour, well-developed capital and money markets, etc.

Further, entrepreneurship is hindered by technological backwardness in underdeveloped countries. This reduces output per man and the products are of substandard quality. Such countries do not possess the necessary technical know-how and capital to evolve their own techniques which may be output-increasing and labour-absorbing. Mostly they have to depend upon imported capital-intensive techniques which do not fit in their factor endowments.

No wonder, LDCs lack dynamic entrepreneurship which Schumpeter regarded as the focal point in the process of economic development.

INSUFFICIENT CAPITAL EQUIPMENT

Insufficiency of capital equipment is another general characteristic of such

countries. Underdeveloped countries are characterized as “capital-poor, or low-saving and low-investing” economies. There is not only an extremely small capital stock but the current rate of capital formation is also very low. In most underdeveloped countries gross investment is only 5-6 per cent of GNP whereas in advanced countries it is about 15-20 pet cent. Such low rates of the growth of capital stock is hardly enough to provide a rapidly growing population (at 2-2.5 per cent per annum), let alone invest in new capital projects. In fact, these countries find it difficult to cover even depreciation of capital and replace the existing capital equipment.

The root cause of this capital deficiency is the problem of undersaving or, more precisely, that of under-investment in productive instruments capable of increasing the rate of economic growth. The per capita income being very low, people on the bare edge of subsistence level cannot, save much thereby leaving very little for further investment. There are extreme inequalities in the distribution of income in such countries. But this does not mean that the volume of savings available for capital formation is high. In fact, large savings are possible only in the case of 3-5 per cent of the people at the top of the income pyramid. Moreover, the persons at the peak of the income pyramid are traders and landlords who have a tendency to invest in unproductive channels such as in gold, jewellery, precious stones, idle inventories, luxurious real estates and money markets abroad, etc.

Another reason as to why the saving ratio does not rise with the increased level of income in the long run is the “demonstration effect.” In everybody there is a great urge “to keep up with the Joneses,” that is, to imitate the standard of living of our prosperous neighbours. Similarly, there is a tendency on the part of the people of the underdeveloped countries to emulate the higher consumption standards of advanced countries. As a result of the demonstration effect, the rise in income is spent on increased expenditure on conspicuous consumption and thus savings are almost static or negligible. This demonstration effect is usually caused by foreign films, magazines and visits abroad.

This tendency to emulate the consumption patterns of advanced countries is to be found not only in the case of private individuals but also in the case of governments. The governments in LDCs emulate social security programmes found in developed countries, *viz.*, minimum wage legislation, health

insurance, pension and provident fund schemes, etc., but these measures put obstacles in the way of entrepreneurship and thus retard capital formation. “It is not surprising,” writes **Haberler**, “that poor and backward economies when they wake up and set their minds to develop in a hurry and catch up with more developed economies are tempted to overspend and live beyond their means.” Thus such countries suffer from chronic capital deficiency and the factors responsible for this are not only economic but also socio-political in nature.

TECHNOLOGICAL BACKWARDNESS

Underdeveloped countries are also in the backward state of technology. Their technological backwardness is reflected, *firstly*, in high average cost of production despite low money wages; *secondly*, in high labour-output and capital-output ratios as a rule, and on the average, given constant factor prices thus reflecting a generally low productivity of labour and capital; *thirdly*, in the predominance of unskilled and untrained workers; and *lastly*, in the large quantity of capital equipment required to produce, a national output. “Deficiency of capital hinders the process of scrapping off the old techniques and the installation of modern techniques, Illiteracy and absence of a skilled labour force are the other major hurdles in the spread of techniques in the backward economy. Thus it may be pointed out that technological backwardness is not only the cause of economic backwardness, but it is also the result of it.”

This technological backwardness is due to technological dualism which implies the use of different production functions in the advanced sector and the traditional sector of the economy. The existence of such dualism has accentuated the problem of structural or technological unemployment in the industrial sector and disguised unemployment in the rural sector. Under developed countries are also characterised by structural disequilibrium at the factor level which leads to technological unemployment. This technological unemployment arises from mal-allocation of resources, the structure of demand and technological restraints.

FOREIGN TRADE ORIENTATION

Underdeveloped economies are generally foreign trade-oriented. This

orientation is reflected in exports of primary, products and imports of consumer goods and machinery. The percentage share of fuels, minerals, metals, and other primary products in the merchandise exports of the majority of LDCs, as revealed by the recent World Bank data is on an average about 80 per cent. For instance, the share of Ethiopia is 99 per cent, of Myanmar 97 per cent, of Uganda 99 per cent, of Indonesia 96 per cent, of Malaysia 80 per cent, of Algeria 100 per cent and of Kenya 86 per cent.

This too much dependence on exports of primary products leads to serious repercussions on their economies. *Firstly,* the economy concentrates mainly on the production of primary exports to the comparative neglect of other sectors of the economy. *Secondly,* the economy becomes particularly susceptible to fluctuations in the international prices of the export commodities. A depression abroad brings down their demand and prices. As a result, the entire economy is adversely affected. *Lastly,* too much dependence on a few export commodities to the utter neglect of other consumption goods has made these economies highly dependent on imports. Imports generally consist of fuel, manufactured articles, primary commodities, machinery and transport equipment, and even food. Coupled with these is the operation of the demonstration effect which tends to raise the propensity to import still , further,

Of late, there has been a secular decline in the income terms of trade (capacity to import) of the underdeveloped countries so that they are faced with the balance of payments difficulties. An underdeveloped country's weak export capacity relatively to its strong import needs is reflected in its persistent external indebtedness. For instance, the gross inflow of public medium and long-term loans to Mexico was 72,510 million dollars and the repayment of principal was 7,502 million dollars in 1985.

The foreign trade-orientation also manifests itself through the flow of foreign capital to underdeveloped countries. It plays a dominant role in developing and expanding the export sector. It also controls and manages those services which are ancillary to the export sector. In this way foreign capital has tended to monopolize its position in certain selected fields like minerals, plantations, and petroleum in underdeveloped countries. The multi-national corporations (MNCs) from the developed countries have spread themselves in developing countries in manufacturing, export-oriented plantations, petroleum and mining. Such a widespread hold of foreign capital drains their resources. The

foreigners are interested only in maximizing their gains at the expense of the developing countries.

CHAPTER

Obstacles to Economic Development

The basic characteristics of underdeveloped countries discussed in the preceding chapter might as well be regarded as the obstacles to their economic development. Even though the general characteristics of underdevelopment are not common to all the underdeveloped countries, yet a broad answer to the question '*why a poor country is poor*' is implicit in these characteristics. A number of these characteristics are both the cause and consequence of poverty. The following factors analyse the mutual causative relationship that inhibit development.

VICIOUS CIRCLES OF POVERTY

There are circular relationships known as the '*vicious circles of poverty*' that tend to perpetuate the low level of development in LDCs. **Nurkse** explains the idea in these words: "It implies a circular constellation of forces tending to act and react upon one another in such a way as to keep a poor country in a state of poverty. For example, a poor man may not have enough to eat; being underfed, his health may be weak; being physically weak, his working capacity is low, which means that he is poor, which in turn means that he will not have enough to eat; and so on. A situation of this sort relating to a country as a whole, can be summed up in the trite proposition: "*A country is poor because it is poor*."[1]

1. R. Nurkse,*op. cit.,* p. 4.

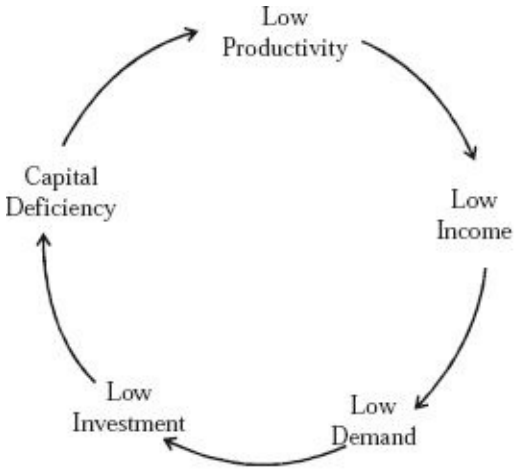

Fig. 1

Fig. 2

Vicious Circles of Poverty

The basic vicious circle stems from the fact that in LDCs total productivity is low due to deficiency of capital, market imperfections, economic backwardness and underdevelopment. However, the vicious circles operate both on the demand side and the supply side. The *demand-side* of the vicious circle is that the low level of real income leads to a low level of demand which, in turn, leads to a low rate of investment and hence back to deficiency of capital, low productivity and low income. This is shown in Fig. 1. Low productivity is reflected in low real income. The low level of real income means low saving. The low level of saving leads to low investment and to deficiency of capital. The deficiency of capital, in turn, leads to low level of productivity and back to low income. Thus the vicious circle is complete from the *supply* side. It is depicted in Fig. 2. The low level of real income, reflecting low investment and capital deficiency is a common feature of both the vicious circles.

A third vicious circle envelops underdeveloped human and natural resources. Development of natural resources is dependent upon the productive capacity of the people in the country. If the people are backward and illiterate, lack in technical skill, knowledge and entrepreneurial activity, the natural resources will tend to remain unutilised, underutilized or even misutilized. On the other hand, people are economically backward in a country due to underdeveloped natural resources. Underdeveloped natural resources are, therefore, both a consequence and cause of the backward people.[2] This is explained in Fig. 3.

2. G.M. Meier and E. Baldwin, *Economic Development p. 320.*

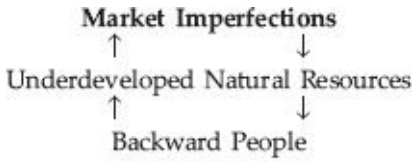

Fig. 3

"Poverty and underdevelopment of the economy are thus synonymous. A country is poor because it is underdeveloped. A country is underdeveloped because it is poor and remains underdeveloped as it has not the necessary resources for promoting development. Poverty is a curse, but a greater curse is that it is self-perpetuating."[3]

LOW RATE OF CAPITAL FORMATION

The most pertinent obstacle to economic development is the shortage of capital. This stems from the vicious circles of poverty analysed above. Poverty is both a cause and a consequence of a country's low rate of capital formation. In an underdeveloped country, the masses are poverty-ridden, they are mostly illiterate and unskilled, use outmoded capital equipment and methods of production. They practise subsistence farming, lack mobility and have little connection with the market sector of the economy. Their marginal productivity is extremely low. Low productivity leads to low real income, low saving, low investment and to a low rate of capital formation. The consumption level is already so low that it is difficult to restrict it further to increase the capital stock. That is why millions of farmers in such countries use outmoded and obsolete capital equipment. Such small sums as they may be able to save are often hoarded in the form of currency or used in purchasing gold and jewellery, etc. The inclination to hoard money is due to absence of banking facilities in rural areas. No wonder, there is little capital formation in underdeveloped countries.

It is the high income group that does most of the savings in underdeveloped countries. But these savings do not flow into productive channels. On the other hand, they are dissipated "into real estate, gold, jewellery, commodity hoards and hoards of foreign or domestic currency, money lending and speculation."[4]

Thus ‘value-retaining’ objects and durable consumer goods dominate their expenditure pattern. In addition, conspicuous consumption plays an important part in their consumption patterns. Consequently, they prefer an imported article for its prestige value to an equally good domestic article.

But what are the main reasons for the lack of incentives to save and invest in underdeveloped countries? These include, imperfect maintenance of law and order, political instability, unsettled monetary conditions, lack of continuity in economic life, the extended family system with its drain on resources, and its stifling of personal initiative and certain systems of land tenure.” The other reasons which inhibit investment are:

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3. K.N. Bhattacharya, *Indian Plans*, p. 4. Prof. Bauer in his *Dissent on Development* regards the thesis of the vicious circle of poverty as invalid because it is conclusively refuted by empirical evidence. The model behind it is defective in that the variables specified or implied in it are either relatively unimportant as determinants of development or they do not interact in the fashion implied. He points out that if the thesis were valid innumerable individuals, groups and communities could not have risen from poverty to riches as they have done throughout the world, in both rich and poor countries. Further, the thesis is also refuted by the very existence of developed countries, all of which started poor, with low income per head and low level of accumulated capital. But they have advanced, usually without appreciable outside capital and invariably without external grants, which would have been impossible according to the thesis of the vicious circle of poverty. Moreover, as the world is a closed system, the thesis is inconsistent with the phenomenon of development: Confusion arises from failure to distinguish between *levels of* saving and rates of saving. Thus, “the thesis of the vicious circle of poverty postulates either that low average levels entail zero rates of change, which is readily refuted by observation, or alternatively that a low level is the same as a zero rate of change which is a simple error in logic.”

4. R. Nurkse. op. *cit.*, p. 26.

Firstly, sheer habit. It is always easier to attempt the familiar than the unfamiliar. By nature man is happy in his old moorings and would not like to take risks in new ventures.

Secondly, small extent of the domestic market. The capacity of the domestic market to absorb new supplies of commodities is limited due to the low purchasing power of the masses.

Thirdly, the difficulties of securing funds for investment purposes are also insurmountable. Many manufacturing activities require large capital-outlays which are difficult to obtain due to lack of a well-developed capital and stock market, and credit and banking system.

Fourthly, the lack of skilled labour and factor mobility enhance the cost of production and thereby hamper potential investors.

Fifthly, absence or inadequacy of basic services like transportation, power and water-supply, etc., further reduce the inducement to invest.

Lastly, the entrepreneurial ability in itself is a scarce factor in most of the underdeveloped countries. Whatever little entrepreneurship is available, that is scared away by high risks involved in investment. The traders and merchants are mostly engaged in the export industry which consists of primary products. Thus, there is no addition to the real stock of capital in these countries.

In between the low income and high income groups, there is a small middle income group. It is mostly engaged in well-established and less risky ventures, such as providing marketing and other services. This group, though not lacking in entrepreneurial ability, is reluctant to invest in manufacturing industries for the reasons which are not far to seek. There is the difficulty of obtaining institutional and corporate finance, advanced technology, trained labour and management. Above all, the difficulties enumerated in the preceding para go together to inhibit the growth of capital in such countries.

SOCIO-CULTURAL CONSTRAINTS

No doubt shortage of capital is a serious obstacle but it is not the only obstacle to economic development. As **Nurkse** has said: "Economic development has much to do with human endowments, social attitudes, political conditions and historical accidents. Capital is a necessary but not a sufficient condition of progress."[5] Broadly speaking, underdeveloped countries possess social institutions and display such attitudes as are not conducive to economic development. According to the UN Report on *Processes and Problems of Industrialization in Underdeveloped Countries* there are 'elements of social resistance to economic change' in underdeveloped countries which include institutional factors characterized by 'rigid stratification of occupations' reinforced by traditional beliefs and values; attitudes involving 'inferior valuation attached to business roles and their incompatibility with the patterns of living and concepts of social dignity upheld by the high status groups' and 'factionalism' which has been defined as 'the tendency of the society; to be

divided by caste and class cleavages, ethnic or religious distinctions, differences in cultural tradition and social pattern, kinship loyalties and regional identification. Such factors tend to inhibit social and geographical mobility and constitute a drag on progress. The people of such countries are averse to accept new values created by the impact of innovations.

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5. *Op. cit.* p. 1.

The family is the primary economic and social unit. Family attitudes are responsible for population pressures and attachment to land. They also limit the range of individual freedom in making economic decisions which in turn influence the motives to save and invest. Money is hoarded or invested in gold, jewellery or in real estate or is spent to meet social obligations on ceremonial occasions to maintain status. Ostentatious expenditure, better known as conspicuous consumption, on the part of the wealthier classes also limits the capacity to save and invest.

In such a society relations are personal or patriarchal rather than universal. People are influenced by kinship or status as determined by caste, clan or creed. "It appears to be difficult to disentangle a person's abilities and capacities as a worker from his caste, religious beliefs, social or geographical origin or other attributes that have little to do with his potential contribution to production. Consequently, efficiency suffers because special abilities go unused."[6] Moreover, administrators, managers, politicians and policy makers belong to the privileged and dominant classes of society. Since such persons do not have the best talents, they stand in the way of good government, clean administration, and in the efficient working of large-scale enterprises. They lead to nepotism, bribery, favouritism and inefficient administration. Bad administration whether in private or public enterprise makes economic development all the more difficult.

Social attitude towards education is further inimical to economic progress. Purely academic education which trains people for government and other clerical jobs is preferred to technical and professional education in such countries. There is prejudice against manual work which is despised and ill-rewarded. Consequently, there develops a natural distaste for practical work and training that leads to technological backwardness.

Oriental religions give less inducements to the virtues of thrift and hard work. People in such societies regard work as a necessary evil rather than a virtue. They place high values on leisure, contentment and participation in festivals and religious ceremonies. Thus, money that can be usefully invested is dissipated in uneconomic ventures. People do not believe that progress is possible through human efforts and man is not helpless before the blind forces of *fate*. Religious dogmas inhibit progress, for they prevent social, economic and political institutions to change in a way that is conducive to economic development. As Dr. S. Radhakrishnan observed, "The qualities associated with the Eastern culture make for life and stability; those characteristics of the West for progress and adventure."[7]

AGRICULTURAL CONSTRAINT

Another obstacle relates to the agricultural sector. The majority of LDCs are predominantly agricultural. Agricultural production constitutes a large share of their GDP and agricultural commodities form a considerable part of the value of their total exports. "Agricultural practices are controlled by custom and tradition. A villager is fearful of science. For many villagers insecticide is taboo. . . . A new and improved seed is suspect. To try it is a gamble. Fertilisers, for example, are indeed a risk. . . . To adopt these untried methods might be to risk failure. And failure could mean starvation."[8] It is, in fact, not the behaviour of farmers that acts as a constraint on agricultural growth. Instead, the constraints are to be found in the environment in which farmers operate the technology available to them, the incentives for production and investment, the availability and price of inputs, the provision of irrigation, and the climate. The LDCs situated in tropical and sub-tropical zones are at a disadvantage in terms of climate. Due to heat and torrential rains, their soils are poor as they contain little organic matter. As a result of the environmental factors, agricultural output fails to increase to meet the rising demand of the developing economy. Further, when the growth rate of population is also high, per capita agricultural and food output may actually decline instead of increasing, as was the case with the low income countries during 1970-80 when their per capita agricultural output declined by 0.4 per cent and per capita food output by 0.3 per cent per year. That is why the percentage share of food in the merchandise imports of many LDCs has been more than 25 per cent which entails a heavy burden on their foreign exchange resources. Thus the

poor performance of the agricultural sector is a major constraint on the sluggish economic growth of LDCs.

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6. N. Buchanan and E. Ellis, *Approaches to Economic Development,* p. 86.

7. *Eastern Religion and Western Thought, p.* 258.

8. Alvin Hansen, *Economic Issues of the 1960s,* pp. 157-58.

HUMAN RESOURCES CONSTRAINT

Undeveloped human resources are an important obstacle to economic development in LDCs. Such countries lack in people possessing critical skills and knowledge required for all-round development of the economy. The existence of surplus labour in them is to a considerable extent due to shortage of critical skills. Undeveloped human resources are manifest in low labour productivity, factor immobility, limited specialisation in occupation, and in customary values and traditional social institutions that minimise the incentives for economic development. Further, "the economic quality of the population remains low when there is little knowledge of available natural resources, possible alternative production techniques, necessary skills, existing market conditions and opportunities, and institutions that might be created to favour economising effort and economic rationality." Since LDCs have a dearth of critical skills and knowledge, physical capital, whether indigenous or imported, cannot be productively utilised. As a result, machines breakdown and wearout soon, materials and components are wasted, the quality of production falls, and costs rise.

FOREIGN EXCHANGE CONSTRAINT

Economists like Myint, Prebisch, Singer, Lewis and Myrdal maintain that certain 'disequalising forces' have been operating in the world economy as a result of which the gains from trade have gone mainly to the developed countries leading to foreign exchange constraint.

After the opening up of underdeveloped countries to world markets, there has been a phenomenal rise in their exports. But this has not contributed much to the development of the rest of the economy of these countries, as the export

sector has developed to the utter neglect of other sectors of the economy. On the other hand, too much dependence on exports has exposed these economies to international fluctuations in the demand for and prices of their products. They have become unstable due to cyclical-instability and balance of payments difficulties. During a depression, the terms of trade become adverse and foreign exchange earnings fall steeply. As a result, they suffer from unfavourable balance of payments. But they are unable to take advantage of a fall in the prices of their products by increasing their exports due to the inelastic nature of supply of their export goods which are mainly agricultural and mineral products. Similarly, they are unable to benefit from a boom in world market. An improvement in their terms of trade is not accompanied by an increase in output and employment due to market imperfections, inadequate overhead capital and structural maladjustments. On the contrary, increased export earnings lead to inflationary pressure, malallocation of investment expenditure and to balance of payments difficulties.

As a result, there has been a secular deterioration in the income terms of trade (or the capacity to import) of LDCs so that they are faced with foreign exchange constraint. This has led to the need for larger inflow of aid and foreign investment. Consequently, debt servicing of amortisation and interest of debt have risen, income payments of dividends and profits on private direct foreign investment have grown, and the net inflow of foreign capital has declined. All these have led to further shortage of foreign exchange reserves which acts as a severe limitation on the development programmes of LDCs.

CHAPTER

Factors of Economic Growth: Economic and Non-Economic

The process of economic growth is determined by two types of factors, economic and non-economic. Economic growth is dependent upon its natural resources, human resources, capital, enterprise, technology, etc. These are economic factors. But economic growth is not possible so long as social institutions, political conditions and moral values in a nation do not encourage development. These are non-economic factors. We study these economic and non-economic determinants of economic growth separately.

ECONOMIC FACTORS

Economists regard factors of production as the main economic forces that determine growth. The growth rate of the economy rises or falls as a consequence of changes in them. Some of the economic factors are discussed below:

1. Natural Resources. The principal factor affecting the development of an economy is the natural resources or land. "Land" as used in economics includes natural resources such as the fertility of land, its situation and composition, forest wealth, minerals, climate, water resources, sea resources etc. For economic growth, the existence of natural resources in abundance is essential. A country which is deficient in natural resources will not be in a position to develop rapidly. As pointed out by Lewis, "Other things being equal, men can make better use of rich resources than they can of poor."[1]

In LDCs, natural resources are either unutilised, underutilised or misutilised. This is one of the reasons for their backwardness. The presence of abundant resources is not sufficient for economic growth. What is required is their proper exploitation. If the existing resources are not being properly exploited

and utilised, the country cannot develop. **J.L. Fisher** has rightly said, "There is little reason to expect natural resource development if people are indifferent to the products or services which such resources can contribute."[2] This is due to economic backwardness and lack of technological factors. Therefore, natural resources can be developed through improved technology and increase in knowledge. In reality, as pointed out by **Lewis**, "the value of a resource depends upon its usefulness, and its usefulness is changing all the time through changes in taste, changes in technique or new discovery."[3] When such changes are taking place, any nation can develop itself economically through fuller utilisation of its natural resources: For example, Britain underwent agricultural revolution by adopting the method of rotation to crops between 1740-60. Similarly, France was able to revolutionise its agriculture on the British pattern despite shortage of land. On the other hand, the countries of Asia and Africa have not been able to develop their agriculture because they have been using old methods of production.

It is often said that economic growth is possible even when an economy is deficient in natural resources. As pointed out by Lewis, "A country which is considered to be poor in resources today may be considered very rich in resources at some later time, not merely because unknown resources are discovered, but equally because new uses are discovered for the known resources." Japan is one such country which is deficient in natural resources but it is one of the advanced countries of the world because it has been able to discover new uses for limited resources. Moreover, by importing certain raw materials and minerals from other countries, it has been successful in overcoming the deficiency of its natural resources through superior technology, new researches, and higher knowledge. Similarly, Britain has developed without non-ferrous metals.

The means of transport and communication have an important bearing on economic growth. Their development reduces the transport costs, and increases the external and internal trade of the country. As a result, the economy progresses. In countries where road, rail, canals or rivers are inter connected with each other, economic growth is encouraged, as has been the case in Britain, France, Germany and the Netherlands.

Thus, for economic growth the existence of abundant natural resources is not

enough. What is essential is their proper exploitation through improved techniques so that there is little wastage and they could be utilised for a longer time.

2. Capital Accumulation. The second important economic factor in growth is capital accumulation. Capital means the stock of physical reproducible factors of production. When the capital stock increases with the passage of time, this is called capital accumulation (or capital formation). The process of capital formation is cumulative and self-feeding and includes three inter-related stages:

(a) the existence of real savings and rise in them;

(b) the existence of credit and financial institutions to mobilise savings and to divert them in desired channels; and

(c) to use these savings for investment in capital goods.

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1. W.A. Lewis, Economic Development with Unlimited Supply of Labour, *The Manchesler School.*, p. 52.

2. J.L. Fisher in Williamson and Buttrick, *op. cit.*. p. 34.

3. W.A. Lewis, *op. cit.*, p. 52.

There are various possibilities of increasing the rate of capital accumulation. Since the propensity to save is low in an LDC, voluntary savings will not be forthcoming in sufficient quantities. Therefore, the obvious way is to resort to forced savings. Forced savings reduce consumption and thereby release resources for capital formation. The various methods of forced savings are taxation, deficit financing and borrowing. **Nurkse** also suggests mobilisation of the disguised unemployed in rural areas for construction works as an important means for capital formation in LDCs. Besides, there are external resources in the form of loans, grants and larger exports that can help in capital formation.

Capital formation is the main key to economic growth. On the one hand, it reflects effective demand and, on the other it creates productive efficiency for future production. Capital formation possesses special importance for LDCs. The process of capital formation leads to increase in national output in a

number of ways. Capital formation is essential to meet the requirements of an increasing population in such economies. Investment in capital goods not only raises production but also employment opportunities. It is capital formation that leads to technological progress. Technological progress in turn leads to specialisation and the economies of large-scale production. Capital formation helps in providing machines, tools and equipment for the rising labour force. The provision for social and economic overheads like transport, power, education, etc., in the country is possible through capital formation. It is also capital formation that leads to the exploitation of natural resources, industrialization and expansion of markets which are essential for economic progress. According to **Lewis**, the rate of capital formation in LDCs is 5 per cent or less which should be raised to the level of 12 to 15 per cent. The estimates of Kuznets reveal that during modern economic growth gross capital formation in developed countries was from 11-13 per cent to 20 per cent and above while net capital formation was from 6 per cent to 12-14 per cent.

Again, according to Kuznets, the incremental capital-output ratio (ICOR) has played an important role in modern economic growth. The (ICOR) reflects productivity of capital. It refers to the additional amount of capital required to produce an additional unit of output. In LDCs, the ICOR is high because large investments are made in social overhead projects requiring long gestation period. Moreover, the rate of unused capacity in capital-intensive manufacturing industries is high due to non-availability of the complementary factors of production. Therefore, efforts should be made to remove such constraints so as to lower the ICOR.

3. Organisation. Organisation is an important part of the growth process. It relates to the optimum use of factors of production in economic activities. Organisation is complement to capital and labour and helps in increasing their productivities. In modern economic growth, the entrepreneur has been performing the task of an organiser and undertaking risks and uncertainties. The entrepreneur is not a man of ordinary ability. He is an economic leader who possesses the ability to recognise opportunities for successful introduction of new commodities, new techniques, and new sources of supply, and to assemble the necessary plant and equipment, management and labour force and organise them into a running concern. He is the kingpin of any business enterprise for without him the wheels of industry cannot move. So

entrepreneurship is an indispensable ingredient in economic development. For instance, the credit for the industrial revolution in England goes to the entrepreneurs, and of the economic growth of the United States in the 19th century and the mid 20th century to the improvement in the quality of management.

But LDCs lack in entrepreneurial activity. Such factors as the small size of the market, capital deficiency, technological backwardness, absence of private property and contract, lack of skilled and trained labour, non-availability of adequate raw materials and infrastructural facilities like transport, power, etc., increase risks and uncertainties. That is why such countries lack entrepreneurs. According to Myrdal, the Asian countries lack entrepreneurship not because they are deficient in capital or raw materials but because they are deficient in persons with right attitude for entrepreneurship. The Japanese possess such attitude in abundance. This is the reason for Japan's rapid economic growth and inclusion among the developed countries.

LDCs should create a climate for encouraging entrepreneurship. To remove market, imperfections, the existing institutions should be improved. Monopolistic institutions should be controlled and curbed. The knowledge of market opportunities should be increased. Laws should be passed and strictly enforced for the protection of property rights .efficiently and the maintenance of law and order within the country.

Besides, it requires the establishment of financial institutions which collect savings and canalise them for entrepreneurial activities. To facilitate this process, such financial institutions like the savings banks, investment banks, and the complex of brokers, dealers and commercial banks that comprise the capital and money markets are required. The government should adopt such monetary and fiscal policies which encourage the growth of entrepreneurship.

The shortage of skilled personnel of various kinds such as workers, scientists, technicians, managers, administrators etc., poses a serious problem in the success of entrepreneurship in underdeveloped countries. It necessitates the setting up of scientific, technological, manage-rial, research and training institutes. Though management and entrepreneurship are two different things in both the private and public sectors, yet scientific, technical and managerial personnel are very important for the success of entrepreneurship.

Apart from providing economic overhead capital, the state should also help in importing machinery and capital equipment and in evolving appropriate technologies in various fields which may be in keeping with the factor endowments of the country.

Facilities to finance such techniques and the supply of raw materials, and wider markets will help in increasing the supply of entrepreneurs. The provision of all the above noted social, economic and technological institutions will push even the latent entrepreneurship in the right direction. Moreover, the state can itself assume the role of an entrepreneur in key, basic and heavy industries, and also in certain consumer goods industries and service sector in public interest.

4. Technological Progress. Technological changes are regarded as the most important factor in the process of economic growth. They are related to changes in the methods of production which are the result of some new techniques of research or innovation. Changes in technology lead to increase in the productivity of labour, capital and other factors of production.

Kuznets traces five distinct patterns in the growth of technology in modern economic growth. They are: a *scientific discovery or* an addition to technical knowledge; an *invention;* an *innovation;* an *improvement;* and the *spread of invention* usually accompanied by improvements. Like Schumpeter, he regards innovation as the most important technological factor in economic growth. In modern economic growth the five factors, mentioned by Kuznets, have helped in the development of technology. Kuznets points out that LDCs must import modern technology to accelerate their productive capacity in the short run because they cannot wait until they themselves invent or modify the technology of advanced countries. But as they adopt imported technology, they must develop their indigenous technical skills.

It is a misnomer that all modern technology is capital-intensive. Advanced countries have also low-cost capital-saving, labour-intensive productivity-raising technology which can be transferred to developing countries.

LDCs should, therefore, benefit from the vast fund of technical knowledge of the advanced countries. However, scientific and industrial technology to be useful in an LDC needs careful processing and adaptation in accordance with its social, economic and technical absorption capacities and requirements.

Above all, imported technology requires strong backing of *R* and *D* studies of problems arising in assimilation, adaptation and improvement in keeping with the factor endowments of the country. One of the principal causes in modern economic growth has been the spending of high percentages of their national income on *R* and *D* by the advanced countries.

5. Division of Labour and Scale of Production. Specialisation and division of labour lead to increase in productivity. They lead to economies of large-scale production which further help in industrial development. They increase the rate of economic development. Adam Smith gave much importance to the division of labour in economic development. Division of labour leads to improvement in the productive capacities of labour. Every labourer becomes more efficient than before. He saves time. He is capable of inventing new machines and processes in production. Ultimately, production increases manifold. But division of labour depends upon the size of the market. The size of the market, in turn, depends upon economic progress, that is, the extent to which the size of demand, the general level of production, the means of transport, etc., are developed. When the scale of production is large there is greater specialisation and division of labour. As a result, production increases and the rate of economic progress is accelerated. Larger pecuniary external economies are available and benefits of indivisibilities accrue. These indivisibilities are power, transport, etc., and their uses lead to industrial progress. Production increases in this way and rapid economic growth takes place.

One of the important factors in modern economic growth has been the spectacular development of the means of transport and communications through such technological changes as railroad, ironclad vessel, automobile and truck, and more recently the jet airplane and supertanker as well as cost-reducing investments, such as the Suez and Panama Canals, and the development of specialised and general press, the radio, the telephone and telegraph communications. Some of the developed countries having vast geographical areas such as the United States, Canada and Australia have been able to expand the size of their internal and external markets through the development of their means of transport and communications.

The growth process in an LDC can be accelerated by widening of the market through adoption of modern means of transport and communications. To widen both domestic and foreign markets, it should also adopt standardisation

and grading of its products. Further, there should be growth in the scale of firms and changes in the type of organisation so that there is greater specialisation and division of labour. In other words, economic growth through agricultural and industrial development in LDCs should be accompanied by commercialisation.

6. Structural Changes. Structural changes imply the transition from a traditional agricultural society to a modern industrial economy involving a radical transformation of existing institutions, social attitudes, and motivations. Such structural changes lead to increasing employment opportunities, higher labour productivity and the stock of capital, exploitation of new resources and improvement in technology.

An LDC is characterised by a large primary sector and a very small secondary sector alongwith an equally small tertiary sector. Structural changes may begin with the transfer of population from the primary to secondary and then to tertiary employment. In an overpopulated agriculture-oriented economy, 70-80 per cent of the population is engaged in the agricultural sector. Structural changes involve the expansion of the non-agricultural sector so that the proportion of population in the agricultural sector is progressively reduced. It implies reduction in the size of contribution to net national output by the agricultural sector. But a decline in the share of the agricultural sector in the net national product does not mean a fall in the output of agriculture. Rather agricultural output must increase in *absolute* terms. In order to increase agricultural output, radical changes will have to be made in the form of land reforms, improved agricultural techniques and inputs, better marketing organisation, new credit institutions etc.

When agricultural production increases, it increases money incomes in the agricultural sector. This, in turn, expands rural demand for consumer goods and agricultural inputs which act as stimulants to the expansion of the industrial sector. The industrial sector itself affects the agricultural sector.

First, the expansion of farm output requires improved farm machinery and other inputs manufactured by the industrial sector.

Second, increasing agricultural productivity and income expands the demand for consumer goods and services available in the industrial sector. “The scope

for increasing agricultural productivity and income, in other words, is heavily dependent upon the structural transformation of the economy as it affects the growth of commercial demand for goods produced, the growth of alternative employment opportunities, and the increased quantity of purchased inputs available to the agricultural sector."

Another important aspect of structural changes is the transfer of population from primary and secondary to tertiary employment. Tertiary production includes a number of *dissimilar* services producing non-material goods like transport, retail and wholesale distribution, education, government and domestic services, etc. With economic development the demand for tertiary products increases very rapidly because the expansion of the agricultural and industrial sectors is dependent largely on the existence of transport, retail and wholesale distribution, technical personnel, etc. So the proportion of working labour in tertiary occupations rises with economic development. But many of the tertiary occupations like railways, motor transport, etc., are of high capital intensity and involve substitution of capital for labour on a large scale. Thus, in the initial phase of economic growth, tertiary occupations fail to absorb large number of people, and the majority of workers become "pedlars of all kinds of goods and services requiring little or no capital outfit, such as vendors of fruit, newspapers, or else car washers, porters, waiters and shop assistants." This type of underemployment is reinforced by disguised unemployment in the rural sector.

An *innovation* or the opening of a new area may bring about a structural change within the economy thereby, widening the domestic market and creating a foreign market. Technical invention takes place in such societies where traditionalism gives way to desire for experimentation. "Apart from the build-up of economic overhead capital, such as a communications and transport system and investment in harbour facilities, some warehouses and similar installation favouring especially foreign trade, most of the innovations introduced during the preparatory period are based upon changes in the institutional arrangements in the legal, educational, familial, or motivational orders. Once these new institutions have been created, they operate as 'gifts from the past,' contributing freely to the vigorous spurt of economic activity in the period of take-off. What is perhaps most important about the structural changes taking place during the take-off period is the adaptation of previously

existing institutions for new ends, especially for capital formation."[4]

However, those structural changes which affect technical skills, administrative and entrepreneurial activities and the supply of capital are more important. The need for capital requires the existence of financial institutions through which savings can be collected and canalized into productive channels. To facilitate this process, such financial institutions like the savings banks, bond and stock exchanges, investment banks and complex of brokers, dealers and commercial banks that comprise the money market are required.

The shortage of skilled personnel of various kinds such as scientists, managers, engineers, administrators, etc., posses a serious problem in LDCs. It requires the setting up of scientific, technological and managerial research and training institutes in the take-off stage. For instance, the practice of Dutch studies under the Tokugawa and the adoption of Western techniques and research facilities in science and technology resulted in far-reaching institutional changes which paved the way for Japan's rapid progress. But the basic problem is to increase the supply of *entrepreneurs* which depends not on a set of particular institutions but upon a whole series of environmental conditions and appropriate personal motivations. Social and economic conditions must be conducive to the exercise of entrepreneurial abilities. Public policies should provide economic overhead capital and favourable monetary and fiscal incentives. Technological advance and facilities to finance innovations will increase the supply of entrepreneurship and so will the mobility of resources and wider markets.

According to Kuznets, these structural changes are accompanied by growth in the scale of firms and changes in the type of organisation within sectors such as manufacturing and trade, from small incorporated firms to the large corporate unit with the rapid shifts in industrial structure and rapid change in technology. There are also rapid shifts in allocation of output among types and sizes of producing firms, and consequently in the allocation of labour force. There is high inter-industry, inter-status and inter-occupational mobility of the labour force among employees from blue to white-collar jobs, from less to more skilled occupations and from small to large enterprises.

NON-ECONOMIC FACTORS

Non-economic factors influence economic growth alongwith economic factors. According to **Nurkse**, "Economic development has much to do with human endowments, social attitudes, political conditions and historical accidents." Therefore, social, cultural, psychological, human, political and administrative factors are as much important as economic factors in economic development. As pointed out by Cairncross, "Development is not just a matter of having plenty of money nor is it purely an economic phenomenon. It embraces all aspects of social behaviour; the establishment of law and order, scrupulousness in business dealings, including dealings with the revenue authorities; relationships between the family, literacy, familiarity with mechanical gadgets and so on."[5] We study the essential non-economic factors below:

1. SOCIAL FACTORS

Social attitudes, values and institutions also influence economic, growth. The term "attitude" means the totality of beliefs and values that cause human behaviour to be what it is. The term "values" refers to motivations of human behaviour towards particular ends.

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4. Bert F. Hoselitz, "Non-Economic Factors in Economic Development," *A.E.R.*, May, 1957.

5. A.K. Cairncross. *Factors in Economic Development,* p. 26.

Modern economic growth has been influenced by social and psychological factors. Western culture and education led to reasoning and scepticism. It inculcated the spirit of adventure which led to new discoveries and inventions and consequently to the rise of the new mercantile classes. These forces brought about changes in social attitudes, expectations, and values. People cultivated the habits of saving and investment, and undertook risks to earn profits. They developed what Lewis calls, "The will to economise," to maximise output for a given input. As a result, the European countries experienced the Industrial Revolution in the 18th and 19th centuries. Economic and religious freedom brought about further changes in social attitudes and values. Single family unit took the place of joint family system which further helped in modern economic growth.

In LDCs there are such social attitudes, values and institutions which are not conducive to economic development. Religion gives less inducements to the virtues of thrift and hardwork. People are fatalists and therefore are not hard working. They are influenced more by traditional customs and place high values on leisure, contentment and participation in festivals and ceremonies. Thus social attitudes stand in the way of development when money is wasted on non-economic ventures. Moreover, the joint family is the primary social and economic unit. It prevents people from taking independent economic decisions, breeds lethargy, and encourages growth in numbers. In such societies relations are personal or patriarchal. People are influenced by caste, clan or creed at the social level.

These social attitudes, values and institutions should be changed or modified for economic development to take place. Social organizations like the joint family, caste system, kinship, and religious dogmas should be modified so that they may be more favourable to development. But it is not an easy task. Any social change will bring discontentment and resistance in its wake. It may, therefore, adversely affect the national economy. Therefore, all socio-cultural changes should be selective. They should be introduced by stages. Persuasion and not coercion should be the method. Education and demonstration can do a lot in this direction. Popular education leads to popular enlightenment and opens the way to knowledge. It opens men's mind to new methods and new techniques of production. It creates self-discipline, power to think rationally and to probe into the future. Emphasizing the importance of education in economic development. Cairncross writes: "No country can count itself developed, in which education in the way of industrial civilization has not taken place. Peasants have to be brought within the monetary economy and not left to pursue subsistence farming; workers have to become used to working fixed hours in factories for wage payments; towns have to grow, and so banks and business enterprises; the fruits of science have to be applied throughout the economy. Above all, there must emerge as a continuing element in the life of the country, a group of business, administrative and political leaders who can be depended upon to maintain the momentum of development by constant innovation."

Certain races have higher tendencies to develop than others, such as Punjabis and Parsees in India, and Negroes in America and Brazil. For development, it

is essential that races should not be kept aloof from each other. Rather, they should be intermixed so that there is a union of cultural values and racial qualities. But such measures require a lot of patience. The society's structure is transformed by such racial changes.

The UN Report on *Economic Development of Underdeveloped Countries*, laying emphasis on changes in social attitudes, values and institutions observes that without painful adjustments rapid economic development is impossible. Old ideas will have to be dispensed with; old institutions will have to be dispensed with; the bonds of caste, religion and race will have to be broken. But the process of change should be evolutionary rather than revolutionary. Otherwise, radical changes in social attitudes and values will bring about dissatisfaction, discontentment and violence in their wake and retard the path to economic development.

Myrdal in his *Asian Drama* advocates the adoption of "modernisation values" or "modernisation ideals" for the rapid economic development of LDCs. Modernisation means "the social, cultural and psychological framework which facilitates the application of tested knowledge to all phases and branches of production." The modernisation ideals include, *first*, rationality in thought and action through a deliberate cultivation of scientific attitude and application of modern technology in order to increase productivity, raise levels of living, and bring about social and economic equalisation. As pointed out by Jawaharlal Nehru, "The test of a country's advance is how far it is utilising modern techniques. Modern -technique is not a matter of just getting a tool and use it. Modern technique follows modern thinking."

But the desire to better their lot and the initiative to make material progress must arise among the nationals of the country. Development must be willed by the country itself; it cannot be implanted from outside. External forces should stimulate and facilitate the national forces. They should supplement and not supplant them. Foreign aid can only initiate or stimulate development; it cannot maintain it. Development will falter in the absence of sufficient internal motivation. Unless the momentum of development comes from within the economy, the initial initiative to development will be dissipated and shortlived. As Cairncross puts it, "Development is impossible if it does not take place in the minds of men." It is, therefore, imperative that if the process of economic growth is to be cumulative and long lasting, the forces of development must be

firmly rooted within the domestic economy.

Modernisation ideals also require changes in institutions and attitudes 'in order to increase labour efficiency and diligence, effective competition, mobility and enterprise; permit greater equality of opportunities, make possible higher productivity and well-being and generally promote development'. The barriers of caste, colour, religion, ethnic origin, culture, language, and provincial loyalties should be broken down, and property and education should not be so unequally distributed as to represent social monopolies. All this is possible through changes in social institutions and attitudes of the people by spreading education and knowledge. People should be aware of the objectives before them and the 'will' to attain them. But where the social set-up is influenced by rigid caste and joint family systems, there is little individual freedom and professional mobility. As a result, people have little incentive to work more, earn more and save more, and have a backward sloping curve of effort and risk taking. For development, therefore, such social institutions and attitudes should be changed which stand in the way of free society and free competition. For instance, Myrdal views the various land reforms in India as attempts to breakup the caste system so as to eradicate social monopolies and barriers to free competition.

Modernisation of ideals with regard to attitudes are called by Myrdal as the creation of the "new man" or the "modern man", the "citizen of the new state", the "man in the era of science", the "industrial man". This implies change in attitudes so that people have efficiency, diligence, orderliness, punctuality, frugality, scrupulous honesty, rationality in decision on action, preparedness for change, alertness to opportunities as they arise in the changing world, energetic enterprise, integrity and self-reliance co-operativeness, and willingness to take the long view.

Changes in attitudes towards modernisation lead to development of the agricultural, industrial and tertiary sectors of the economy. But the development of these sectors is not possible without *entrepreneurship.* According to Myrdal, LDCs lack entrepreneurship not because they are deficient in capital or raw materials but because they are deficient in persons with right attitude for entrepreneurship. **E. Hagen** in his *On the Theory of Social Change* (1962) ascribes the lack of entrepreneurship to the childhood environment in the traditional society which creates tensions, anxieties, and

rage among adults. They suffer from “respect withdrawal” and develop “retreatism” as the dominant personality trait. According to Hagen, it is over a very long period of several generations that there develops a class of entrepreneurs with “need achievement” motivation. Such psychological attitude emerges when a generation of fathers demand achievement or do not stand in the way of achievement, and mothers play a supporting role in encouraging activity on the part of infants.

McClelland in *The Achieving Society* (1961) propounds the view that the growth of entrepreneurship depends on the need for achievement motivation. According to him, n-Ach (n-achievement) is a relatively stable personality characteristic rooted in experiences in middle of childhood. Variations in n-Ach levels were correlated with the stories in children’s textbooks, and it was found that n-Ach was very high in the United States of America 80 or 90 years ago. It is the highest in Russia and China now. It is rising in such developing countries as Mexico and Nigeria. He attributes high n-Ach in these countries to ideological reform hypothesis, to Protestantism in Europe and America, to zealous Communist ideology in Russia and China, and to the spirit 0f nationalism in the developing countries.

McClelland alongwith David Winter conducted experiments in Kakinada town of Andhra Pradesh in India and revealed that neither money, nor caste, nor traditional beliefs played an important part in the n-Ach factor in the emergence of entrepreneurship there. It was found that those who were trained in the Small Industries Extension Training Institute at Hyderabad in 1964-65 for a two-week motivation programme displayed a more active entrepreneurial behaviour later on. Thus, attitudes, motivations and environment should all combine to promote entrepreneurship for economic development.

2. HUMAN FACTOR

Human resources have been an important factor in modern-economic growth. Economic growth does not depend on the mere size of human resources but on their efficiency. According to Kuznets, the population of Europe increased by 433 per cent between 1750-1950 while the population of the remaining world increased by 200 per cent over the period. Whereas population increased five-

fold in European and now developed countries, there was ten-fold increase in their GNP per capita. Such a phenomenal increase in their GNP per capita is attributed to the development of the human factor which is reflected in the increased efficiency or productivity: of their labour force. This is called human capital formation. This "is the process of increasing knowledge, the skills, and the capacities of all people of the country." It includes expenditure on health, education and generally on social services. Denison's estimates reveal that expenditure incurred on education in the United States between 1929-57 contributed 23 per cent to its gross national output . According to **Soloman Fabricant**, the increase in the total national product of the United States through increase in physical capital between 1889-1957 equalled the increase through higher labour productivity.

But rapidly increasing population is a great hindrance to the economic development of LDCs. With their low per capita incomes and low rates of capital formation, it becomes difficult for them to support the increase in population. And when output increases due to improved technology and capital formation, it is swallowed up by increase in numbers. As a result, there is no improvement in the real growth rate of the economy.

A proper use of human resources can be made for economic development in the following ways:

First, there should be control over population. Human resources can be utilized best if the size of population is controlled and reduced. This requires family planning and research on population control so as to bring down the birth-rate.

Second, there should be change in the outlook of the labour force. The social behaviour of the labour force is important in the process of economic development. To increase labour productivity and the mobility of labour, there should be change in the outlook of the people so that they should imbibe the importance of dignity of labour. This requires changes in institutional and social factors. Such changes depend upon the spread of education. It is the educated and trained labour force with high productive efficiency that leads to rapid economic development. Thus "the most important requirement of rapid industrial growth is people. People ready to welcome the challenge of economic change and the opportunities in it. People, above all, who are

dedicated to the economic development of their country, and to high standards of honesty, competency, knowledge and performance."

3. POLITICAL AND ADMINISTRATIVE FACTORS

Political and administrative factors also helped in modern economic growth. The economic growth of Britain, Germany, the United States, Japan and France has been due to their political stability and strong administration since the 19th century. With the exception of the United States, they were directly involved in the two World Wars and were devastated. Still they have continued to progress on the strength of their political and administrative traditions. On the other hand, Italy has not been able to grow up to their level due to political instability and corrupt and weak administration. Peace, protection and stability have encouraged the development of entrepreneurship in developed countries, alongwith the adoption of appropriate fiscal and monetary policies by the governments from time to time.

The weak administrative and political structure is a big hindrance to the economic development of LDCs. A strong, efficient and incorrupt administration is, therefore, essential for economic development. **Prof. Lewis** rightly observed: "The behaviour of government plays an important role in stimulating or discouraging economic activity." Peace, stability and legal protection encourages entrepreneurship. The greater the freedom, the more the entrepreneurship will prosper. Technical progress, factor mobility and large size of market help stimulate enterprise and initiative. But the former can only take place under clean administration and stable political conditions. Similarly, a good government can help in capital formation by adopting the right monetary and fiscal policies, and by providing timely overhead capital fatilities. Thus "a government must offer society the services if it desires to stimulate economic development: order, justice, police and defence; rewards commensurate with ability and application in productivity, security in the enjoyment of property which may be of extremely varied character; testamentary rights; the assurance that business covenants and contracts will be kept; the provision of standards of weights and measures and currency and the stability of governmental system itself, to maintain the sense of order and future calculability of expectations and duties." In this way, clean and strong administration, full of justice, stimulates economic development. As rightly

pointed out by **Lewis**, “No country has made progress without positive stimulus from intelligent governments.”

All LDCs have emerged as independent nations from the colonial rule. But independence has not necessarily led to national consolidation. Myrdal regards national consolidation as “a pre-condition both for the preservation of the states as a growing concern and for its efficient functioning as a matrix for the effective formation and execution of national policies, that is for planning.” By national consolidation he means “a national system of government, courts and administration that is effective, cohesive, and internally united in purpose and action, with unchallenged authority over all regions and groups within the boundaries of the state.” National consolidation, in turn, requires “emotional integration” which coincides with the modernisation ideals of changes in values, attitudes and institutions.

CHAPTER

Chenery's Patterns of Structural Change

INTRODUCTION

Hollis Chenery[1], in his empirical studies of patterns of development of numerous less developed countries during the post-war period identified some uniform characteristics in their patterns of structural changes that normally accompany economic development.

Chenery defines the development pattern "as a systematic variation in any significant aspect of the economic or social structure associated with a rising level of income." But he is primarily interested in those structural changes that are needed to achieve sustained increase in per capita income.

In describing the process of development, he replaces the notion of a dichotomy between less developed and developed countries with the concept of "transition" from one stage to another. He defines transition "as a set of structural changes that have almost always accompanied the growth of per capita income in recent decades."

1. Hollis B. Chenery, *Structural Changes and Development Policy,* 1979; Hollis B. Chenery and M. Synquin, *Patterns of Development 1950-70,* 1975.

DEVELOPMENT PROCESSES

Chenery takes *three* principal developments which are further divided into *ten* basic development processes that describe different dimensions of the overall structural transformation of a less developed country to a developed one. They are as follows :

1. Accumulation Processes
   a. Investment
   b. Government revenue
   c. Education

2. Resource Allocation Processes
   a. Structure of domestic demand
   b. Structure of production
   c. Structure of trade

3. Demographic and Distributional Processes
   a. Labour allocation
   b. Urbanization
   c. Demographic transaction
   d. Income distribution

These characteristics of the development process are explained as under :

ACCUMULATION PROCESSES

Accumulation is the use of resources to increase the productive capacity of an economy. The accumulation processes comprise :

1.*Investment* consisting of (a) gross domestic savings as % of GDP, (b) gross domestic investment as % of GDP, and (c) capital inflow (net imports of goods and services) as % of GDP.

2. *Government revenues* consisting of (a) government revenue as % of GDP, and (b) tax revenue as % of GDP.

3. *Education* consisting of (a) education expenditure by government as % of GDP, and (b) enrollment ratio.

Changes in these accumulation processes take place relatively early in the transition. The total increase in saving, investment and school enrollment is normally half completed at an income level of $ 200 and 90% at about $ 700.

There is substantial variation in accumulation process in the inflow of capital

at low income levels. It is equal to 25% of investment at the lowest levels, declining to 10% at $200 and 5% at $ 400.

Unlike saving and investment, the rise in taxation and government revenue and expenditure is a relatively late process that does not reach its halfway mark until about $400 per capita.

Education constitutes the largest element of public expenditure in most developing countries and more than half of all investment in human capital.

RESOURCE ALLOCATION PROCESSES

Resource Allocation processes comprise :

1. *Structure of domestic demand* consisting of : (a) Gross domestic investment as % of GDP; (b) private consumption as % of GDP; (c) government consumption as % of GDP, and (d) food consumption as % of GDP.

2. *Structure of Production* consisting of: (a) Primary output as % of GDP; (b) industry output as % of GDP; (c) utilities output as % of GDP; and (d) services output as % of GDP.

3. *Structure of Trade* consisting of : (a) Exports as % of GDP; (b) primary exports as % of GDP; (c) manufacturing exports as % of GDP; (d) services exports as % of GDP; and (e) imports as % of GDP.

Resource allocation processes produce systematic changes in the sectoral composition of domestic demand, international trade, and production as the income level increases. These patterns result from an interaction between the demand effects of rising income and the supply effects of changes in factor proportions and technology.

The three sets of resources allocation processes have a number of common features. Over the whole transition, per capita food consumption increases only half as much as per capita income due to the Engel effects. The corresponding decline in the share of food consumption leads to a doubling in the share of investment and large increase in non-food consumption. These

shifts lead to a doubling in the share of industrial goods, apart from foodstuffs, in total demand over the transition.

The change in composition of demand is almost uniform in the allocation processes and of the composition of trade is the least uniform. While food consumption, primary exports and primary production decline almost uniformally, the growth of exports is not regular.

The change in the composition of exports is the reverse of composition of domestic demand. Primary exports decline while primary imports rise as percent of GDP. This reflects the shift in domestic demand for primary products and the limited domestic supplies of natural resources and the slow growth of world demand.

With changes in the domestic demand and in trade reinforcing each other, the total change in the productive structure is more pronounced. Similarly, the effect of population growth on the levels of imports and exports is quite pronounced. Value added in primary production falls considerably, nearly twice as much as the reduction in food demand, while the rise of industrial output is much greater than the rise in domestic demand.

The shift in the normal patterns of production shows that the shares of primary output and industrial output fall and that of utilities and services rise. The fall in the share of primary output over and above the rising income, is due to technological progress and the substitution of industrial products for raw materials.

DEMOGRAPHIC AND DISTRIBUTIONAL PROCESSES

Demographic and distributional processes include :

1. *Labour allocation* comprising (a) share of primary labour; (b) share of industry labour; and (c) share of service labour.

2. *Urbanisation* as urban percent of total population.

3. *Demographic transition* in (a) birth rate, and (b) death rate.

4. *Income distribution* as (a) share of highest 20%, and (b) share of lowest

The distribution of income is influenced by level of education, structure of production and availability of government revenue for redistribution. It is also affected by a number of socio-economic processes like mortality, fertility and urbanisation that are themselves correlated with the income level.

1. Labour Allocation. There are significant differences between the pattern of employment and pattern of structural change in production. They are:

(*a*) Demand for labour grows more rapidly in urban areas while the increase in supply of labour is more from rural areas.

(*b*) At the lowest income levels, the primary sector produces 52% of total output and provide 71% of employment.

(*c*) As income rises, the fall in the share of primary output is more rapid than the fall in employment in the primary sector. It reflects the concentration of investment and technological progress in industry and accumulation of surplus labour in agriculture.

2. Urbanisation. The relationship of the process of urbanisation to the level of development is about as uniform and stable as that of most other processes. Contrary to the popular impression that migration to cities has been fast increasing, Chenery's study shows no significant time trend. However, migration from rural to urban areas has been ahead of growth of demand for labour and has been determined increasingly by *expected* rather than current wages.

3. Demographic Transition. Early in the transition, the income related fall in the death rate exceeds the fall in the birth rate above per capita income levels of $200, leading to maximum rates of population growth. But many demographic influences vary in importance according to the level of development. More education leads people to reduce birth rates where they are high but not where birth rates are already low at higher income levels. In less developed countries, both higher education and lower infant mortality lead to lower birth rates. However, urbanisation does not show a significant effect on the birth rate once the separate effects of education, income level and infant mortality have been

allowed for.

4. Income of Distribution. Chenery divides income recipients into three groups: the top 20%, the middle 40% and the lowest 40%. His results show that the share of the lowest and the middle income groups declines and that of the top group rises. In the early part of transition, income distribution worsens, when population growth is very high and the modern sector is too small to absorb a sufficient proportion of the growth of labour force. But with high levels of education, there is a shift of income away from the top 20% to the bottom 40%. Further, higher share of primary production have more equal distribution of income than industrial production.

CONCLUSION

Most of the ten processes of structural changes described above can be explained by a logistic or S-shaped curve having asymptote at low or high income levels which reflect the structural characteristics of the development processes.

CHAPTER

Meaning and Characteristics of Modern Economic Growth

MEANING

Modern economic growth refers to the development of the developed countries of Western Europe, the United States, Canada, Australia and Japan.

Prof. Simon Kuznets in his *Nobel Memorial Lecture* defined economic growth "as a long-term rise in capacity to supply increasingly diverse economic goods to its population, this growing capacity is based on advancing technology and the institutional and ideological adjustments that it demands."[1] This definition has three components:

First, the economic growth of a nation is identified by the sustained increase in the supply of goods.

Second, advancing technology is the permissive factor in economic growth which determines the growth of capacity in supplying diverse goods to the population.

Third, for an efficient and wide use of technology and its development, institutional and ideological adjustments must be made to effect the proper use of innovations generated by advancing stock of human knowledge. For example, modern technology is incompatible with the rural mode of life, the large and extended family pattern, family enterprise and illiteracy.

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1. In his earlier book *Modern Economic Growth,* 1966, Kuznets defined economic growth "as a sustained increase in per capita or per worker product, most often accompanied by an increase in the population and usually by sweeping structural changes."

CHARACTERISTICS OF MODERN ECONOMIC GROWTH

Modern economic growth marks a distinct economic epoch. Prof. Simon Kuznets has pointed out six characteristics of modern economic growth that have emerged in the analysis based on national product and its components, population, labour force, and the like. Of the six, two characteristics are *quantitative* that relate to national product and population growth, two relate to *structural* transformation, and two to *international* spread. We will discuss them one by one here:

1. HIGH RATES OF GROWTH OF PER CAPITA PRODUCT AND POPULATION

Modern economic growth, as revealed by the experience of the developed countries since the late eighteenth or early nineteenth century, is characterised by the high rates of increase in per capita product accompanied by substantial rates of population growth. The extremely high rates of increase are at least five times as high for population and at least ten times as high for production as observable in the past.

Prof. Kuznets has shown that the rates of population growth of thirteen countries, excluding France, have been high in modern times than in pre-modern times. Leaving France with a population increase of 2.5 per cent per decade, the rates of population growth range from 6-7 per cent for UK, Sweden, Italy, and the USSR, to 8 per cent for Switzerland and Norway, to 10-14 per cent for Denmark; West Germany, Japan and the Netherlands, and to 19-24 per cent for Canada, the United States and Australia.

The decade rates of growth in per capita product of all these developed countries, except Australia with 8 per cent decade rate, are above 13 per cent. They range from 13.5-14.1 per cent for the Netherlands and the UK, to 16-19 per cent for Switzerland, the United States, France, West Germany, Canada, Italy, Norway and Denmark, and to above 26 per cent for Japan, 28.3 per cent for Sweden and 43.9 per cent for the USSR.[2]

“That modern economic growth meant a striking accelerated rise not only in product per capita but also in population does not imply that the latter was a

necessary condition for the former. In some countries high rates of growth in per capita product were accompanied by high rates of population increase, and in others by low rates "[3] For instance, rate of growth of population per decade in the USSR was low (6.9 per cent) but the rate of increase in per capita product was the highest, 43.9 per cent. Similar was the case with the UK, Sweden and Italy with low per decade population growth rates of 6.1, 6.7 and 6.8 per cent while their per capita product growth rates per decade were 14.1, 28.3 and 18.7 per cent respectively. If we were to take France, its per capita growth rate was 14.1 per cent against the population increase rate of 2.5 per cent. On the other hand, high population growth rates of 21.6 per cent and 19.1 per cent for the United States and Canada were associated with high per capita product growth rates of 17.2 per cent and 18.1 per cent respectively. "Apparently, other factors —relative availability of natural resources, timing of the inception of the modern growth process, or institutional conditions—complicate the effects of population growth and prevent a simple association between'it and growth in per capita product, and population growth itself may have both expansive and depression effects on the increase in per capita product that differ in their weight in conjunction with other factors."[4]

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2. S. Kuznets, *Post-War Economic Growth,* Four Lectures, 1964, Table 4.

3. S. Kuznets, "Population and Economic Growth," *Proceedings of the American Philosophical Society,* Vol. Ill, No. 3, June 1967.

High rates of growth of per capita product and population imply high rates of increase in total product. During the periods of modern economic growth, the rate of growth per decade in total product was the highest (53.8 per cent) for the USSR followed by the USA (42.5 per cent), Japan (42 per cent) and Canada (40.7 per cent). It was the lowest for France (20.8 per cent) and the UK (21.1 per cent). The growth rates of total product of other countries ranged between 21 and 40 per cent. The divergencies between these growth rates "result in enormous multiplication of the total magnitude of performance, a decadal rate of growth of 20 per cent means a multiplication in a century to over 6 times the initial level; a rate of 50 per cent means a rise to about 58 times the initial level."[5]

Taking the non-communist developed countries as a whole, the rates of growth

per year over the period of modern economic growth, were almost 2 per cent for per capita product, 1 per cent for population and 3 per cent for total product. These rates roughly mean a multiplication over a century by *five* for per capita product, by *three* for population, and by more than *fifteen* for total product.[6]

2. THE RISE IN PRODUCTIVITY

Modern economic growth is characterised by a rise in the rate of per capita product due primarily to improvements in the quality of inputs which led to greater efficiency or rise in productivity per unit of input. This is traceable either to an increase in input of resources of labour and capital or to an increase in efficiency, or to both. Increase in efficiency implies greater output per unit of input. According to Kuznets, we find that the rate of increase in productivity is large enough to account for almost the entire growth of product per capita in the developed countries. Even with adjustments to allow for hidden costs and inputs, growth in productivity accounts for over half of the growth in product per capita.

The growth of national product has been due to the enormous addition to population which led to a large increase in labour force. The increase in national product in turn led to a considerable increase in capital accumulation and hence in reproducible capital. The proportion of labour force to total popualtion showed an upward trend for all developed countries except Switzerland, Italy and Australia. It was the highest for Denmark (29.4%), followed by the United States (25.2%), Canada (18.3%), Belgium and Germany (15.8%), Sweden (14.6%) and Great Britain (13.1%). “This rise may have been due to a shift in the age structure of the population in favour of working age, associated with decline in birth rate and in the proportions of population *below* working age; or to increasing participation of women in gainful occupations...and of lowering of the age of retirement. Whatever the reason, the proportion of gainfully occupied to total population, increased.”

But economic growth of developed nations has been accompanied by the long-term decline in the number of man-hours per capita. This tendency reflects increase in efficiency or productivity. Leaving the exceptional case of Italy where man-hours per capita declined by 7.5 per cent per decade, the overall

decline in man-hours per capita per decade for all other developed countries ranged between 1.1 per cent for Great Britain, 2 to 2.4per cent for Belgium, Germany, Denmark, Sweden, Norway and the United States, 2.8 to 3.5 per cent for Canada, France and Australia, 4.1 per cent for Switzerland and 4.5 per cent for Netherlands.

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4. S. Kuznets, *Modern Economic. Growth,* l966. Data in this chapter are mostly based on this study.

5. *lbid.*

6. S. Kuznets, *Economic Growth of Nations : Total Output and Production Structure.* 1971.

The contribution of capital input to rise in product per capita can be assessed by the trends in the capital-product ratios. The ratio of reproducible capital to national product rose by 11 per cent in the United States (between 1850-1950), 9 per cent in Great Britain (between 1865-1933) and by 7 per cent in Japan (between 1905-35). On the whole, the incremental capital-product ratio rose from 1.6 per cent in the late 19th century and early 20th century to 3.1 per cent in the 20th century for all developed countries.

Further, the net domestic incremental capital-output ratio rose from 2.6 to 3.6 for Sweden, from 4 to 5.1 for Norway, from 2.4 to 2.8 for Denmark and from 2.9 to 5 for Australia between the second half of the 19th century and the first half of the 20th century.

3. HIGH RATE OF STRUCTURAL TRANSFORMATION

Structural transformations in modern economic growth include the shift away from agriculture to non-agricultural activities and from industry to services a change in the scale of productive units, and a related shift from personal enterprises to impersonal organization of economic firms, with a corresponding change in the occupational status of labour:

The share of the agricultural sector in total product declined in all developed countries except Australia. In the case of Great Britain, it declined from 22 per cent in 1841 to 5 per cent in 1955; from 42 per cent between 1872-82 to 9 per cent in 1962 for France; from 49 per cent in 1879 to 9 per cent between 1939-48 for United States; and from 63 per cent between 1878-82 to 14 per cent in

1962 for Japan. Thus by the end of the long periods the share of this sector in total product was less than 10 per cent in the case of UK, France, Germany, Netherlands and the USA, while it ranged between 10 to 26 per cent in Denmark, Norway, Sweden, Italy, Canada, Australia, Japan and the USSR.

On the other hand, the share of the industrial sector rose to more than 50 per cent by the end of the long periods for Great Britain (56%), France (52%), Germany (52%), Netherlands (51%), Norway (53%), Sweden (55%), and the USSR (58%), while it ranged between 22 to 49 per cent for Italy (22%), Australia (30%), United States (42%), Denmark (48%), Canada (48%), and Japan (49%).

So far as the movements in the share of the services sector are concerned, they are neither marked nor consistent among countries. The share of the services sector declined in Sweden and Australia while it rose in Canada and Japan. In other countries, the trend on balance was too small to be significant.[7]

The rapidity of structural transformations in modern economic growth can also be illustrated by the changes in the distribution of labour force among the three major sectors. By the end of the long periods of growth, the share of labour force attached to agricultural sector was 5 per cent in Great Britain, 12 per cent in the USA, 17 per cent in Australia, 19 per cent in Denmark, Sweden and Canada, 20 per cent in Switzerland and France, and 25 per cent in Norway. But it was high in Japan (33 per cent), and the USSR (40 per cent). Consequently, the share of labour force attached to the industrial sector ranged between 40 to 58 per cent for all countries, except Japan and the USSR, the latecomers in the field of industrialisation. But the share of the services sector in total labour force either remained constant or changed relatively little in Great Britain, Belgium, the Netherlands, Sweden and Australia. But, there was marked absolute and relative rise in Switzerland, Denmark, Norway, Italy, the United States, Canada, Japan and the USSR.

The inter-sectoral shifts were accompanied by growth in the scale of firms and changes in the type of organisation within sectors such as manufacturing or trade, from small incorporated firms to the large corporate units with the rapid shift in industrial structure and rapid change in technology. There were also rapid shift in allocation of product among types and sizes of producing norms,

and consequently in the allocation of labour force. There was high inter industry, interstatus and inter-occupational mobility of the labour force among employees from blue-to white-collar jobs, from less to more skilled occupations and from small to large enterprises.[8]

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7. S. Kuznets, *Modern Economic Growth*, 1966.

4. URBANISATION

Modern economic growth has been characterised by the movement of an increasing proportion of population in developed countries from rural areas to urban areas. This is urbanisation. Urbanisation is largely a product of industrialisation. The economies of scale arising from non-agricultural pursuits as a result of technological changes led to the movement of a large proportion of labour and population from the rural to the urban areas. As the technical means of *transportation*, communication and organisation grew more effective, there was the spread of increasing optimum scale units. All these processes affected the grouping of population by social and economic status and transformed the basic pattern of life. The effects of urbanisation on modern economic growth of developed nations led to the decline in birth-rate and the shift toward the small family. It brought people together from different rural areas who initiated and learnt from each other and from those already living in towns. It facilitated the development of impersonal relations of modern life and also taught cooperation. Above all, it created conditions for the intense intellectual activity associated with modern civilisation, and thereby created favourable conditions for the increase in knowledge.[9]

Besides, urbanisation affected the level and structure of consumer expenditure in developed countries in three ways, according to Prof. Kuznets.

First, urbanisation led to an increasing division of labour, growing specialisation, and the shift of many activities from non-market oriented pursuits within the family or the village to specialised market-oriented firms. “Much food processing, tailoring, dress-making, and even building and repairing of houses, was one time done within the household or by communal efforts within the village; and today a large part is performed by business firms within the urbanised modern society.”

Second, urbanisation made the satisfaction of an increasing number of wants more costly. Urban life became costiler because of congestion and overcrowding. This created difficulties of housing, sanitation, water, intracity and city transportation and similar basic amenities in the cities. These are the extra costs of urban life which increased consumer expenditure on different types of consumer goods.

Third, the demonstration effect of the city life led to imitation of consumption patterns by the large immigrants, which led to increased consumer expenditure.[10]

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8. *Ibid.*

9. S. Kuznets, *Economic Growth and Structure,* 1965.

10. S. Kuznets, *Modern Economic Growth, 1* 966.

5. THE OUTWARD EXPANSION OF DEVELOPED COUNTRIES

The growth of developed countries has been most unequal. Modern economic growth occurred in some nations earlier than it did in others. This was due largely to differences in historical background and antecedents. Thus when modern science and knowledge developed, Industrial Revolution occurred first in England in the second half of the 18th century and later on, it spread to other countries of Europe. Modern economic growth was concentrated in European countries and their offshoots overseas until the entry of Japan, in the late 19th century and of the USSR in the 1930s.

The outward expansion of developed countries with their European origin has been primarily due to the technological revolution in transportation and communication. This led to more direct political dominance over the colonies, the opening up of previously closed areas like Japan and the partition of undivided areas like sub-Saharan Africa. It was the threat of force on the part of the developed countries that led to the spread of growth in Japan and the USSR. On the other hand, the partition of Africa and greater political dominance over the colonies were due to the revival of imperialism which was responsible for the outward expansion of developed countries like Germany

and the United States in the last quarter of the 19th century. Thus political or power element in international relations is an important factor in the spread of modern economic growth. This "meant ever-increasing interdependence among nations because of the potential of closer contact and because of the sharing of an increasing number of nations of one and the same transnational stock of knowledge."

Such dependence led to the spread in developed nations of modern education that increased their capacity to exploit and contribute to the available stock of tested and useful knowledge. An important element in this was the use of a common language for increasingly large groups in the developed countries, which led to the sharing of a common body of knowledge and techniques. But the selection of knowledge and techniques made by any one nation depended upon its time of entry into the process of modern economic growth and upon the characteristics specific to that nation with respect to size, natural resources and historical heritage. For instance, the development of shipping in the economic growth of Norway, of paper and iron in Sweden, and of agricultural products in New Zealand and Australia highlight the importance of these factors in modern economic growth.

But modern economic growth failed to spread to LDCs due to two factors.

First, such countries do not possess a stable and flexible political and social framework which may accommodate rapid structural changes and encourage growth-promoting groups in society.

Second, the colonial policies followed by the developed countries limit political and economic freedom in LDCs. As a result, the LDCs have failed to take advantage of the spread of modern economic growth and have continued to remain backward with the exception of Japan.

6. INTERNATIONAL FLOW OF MEN, GOODS AND CAPITAL

The international flow of men, goods and capital increased from the second quarter of the 19th century to First World War but decline began with First World War and continued till the end of Second World War. There has been, however, rise in some of these flows since the early 1950s. We discuss these flow one by one.

(a) Migration. The cumulative and increasing volume of **international** migration since the late 1840s and continuing to First World War has an important bearing-upon the patterns of modern economic growth. International migrations were at an *annual* level of over a quarter of a million in 1846-50 and rose to a peak of about 1.5 million in 1906-15. The addition of intercontinental migration would have raised the annual volume of international migration in the decade before First World War to close to 2 million, according to Kuznets' estimates. For the period 1846-1932, 95 per cent of the total inter-continental emigration was from Europe and almost 58 per cent of the total intercontinental immigration between 1821-1932 was to the United States. It is highly significant that the population of Asia and Africa barely participated in this flow during the 19th and 20th centuries and that 67 per cent of emigrants from Europe went to North America, 6 per cent to Australia and New Zealand, 11 per cent to Argentina and 7 per cent to Brazil. Thus the intercontinental migration was from the older countries of Europe to the younger and emptier countries of North and South America and Oceania.

The factors which led to these international migration were the easing of intercontinental transportation by steamships and of intracontinental migration in Europe by railways. But migration flows to the United States was due to the pull of better economic conditions. However, in the long-run the push had been an important factor due to the progressive impact of the dislocation produced by the modernisation of agriculture and industry in Europe. This 'push factor' was primarily responsible for intercontinental migrations from Europe to North and South America, to European colonies in Africa and offshoots in Oceania.

During and after First World War, international migration almost stopped. First, due to the War, and *second* , due to the imposition of legal restrictions especially during the depression decade of the 1930s. This phenomenon continued to persist during and after the Second World War and even in the 1950s.

(b) Flow of Goods. Foreign commodity trade has been by far the most dominant component of outward expansion of the developed countries. Two trends are observed in this regard:

First, there is the high rate of growth of world trade between 1820s and 1913.

Between 1820-30 and 1850-60 and between 1850-60 and 1880-89, the rate of growth was 50 per cent per decade, and about 37 per cent per decade between 1881-85 and 1911-13.

Second, the share of the few developed countries in the world foreign trade has been high between 1820s and 1913. North-west Europe and the United States accounted for six-tenths in 1820-30 and two-thirds in 1880-89. The share of the same countries with Canada and Australia added was roughly two-thirds between 1881-85 and 1913, but their share declined significantly after the First World War.

Between the 1850s and First World War, the proportion of commodity foreign trade to total output rose significantly but by the low rates for the few larger countries. They were Canada, Australia and the United States. But the volume of foreign commodity trade grew more rapidly than the volume of world output. The quantum of world commodity trade tripled between 1850 and 1880 and then tripled again between 1880 and 1913, thus rising to nine times its original level. According to **Kuznets** , on the assumption that world per capita income doubled over the period, the ratio of world commodity trade to total output would have almost tripled from 1850 to 1913, and the increase was probably greater than that.

Prof. Kuznets traces out four factors that led to greater increase in growth of foreign trade than of domestic output over the decades before First World War in the old developed countries:

The *first* , was the revolution in trasportation of commodities with the development of steam railroads and ocean transportation.

The *second,* was the decision by the United Kingdom to develop free trade and international division of labour.

The *third* was the relaxation of trade barriers by all the developed countries.

The *last,* was the opening of the West in the United States, in Canada, Australia and Argentina leading to European specialisation in industry.

But beginning with First World War the rate of growth in the absolute volume

of foreign trade declined. In 1913, the index of foreign trade was about 300 and by 1947-51 it was about 400. Thus between 1913 and 1947-51 world trade increased about a third. On the other hand, in the three decades before First World War it tripled. Since First World War, world population grew by 40 per cent and world per capita income also grew somewhat, therefore, the ratio of world trade to world population declined significantly since 1914.

(c) Flow of Capital. International flow of foreign capital investments grew rapidly from the second quarter of the 19th century to First World War. For the three major exporters of capital (Great Britain, France and Germany), capital outflow for the period 1874-1914 averaged between $0.5 and $1.1 billion per year at 1913 prices. The increase in the cumulative total of foreign capital invested by these three countries rose from $4.9 to $35.3 billion over the period at 1913 prices which comes to a rate of growth per decade of 64 per cent.

A substantial portion of these capital flows went to developed countries and was based on political rather than economic considerations. “Of the total foreign investments of Great Britain, almost half were within the empire; of French foreign investments close to half were in Russia, Turkey, the Balkan states, Austria-Hungry, and her colonies; and of Germany’s investments, about one-third went to Austria-Hungary, Turkey, Russia and the Balkan states. Although in some cases economic and political considerations may have coincided, in others the line of distinction cannot be drawn sharply, a sizable portion of foreign capital investments was probably motivated by political considerations.”

The flow of international capital during the inter-war period were of the order of $ 110-170 million per year at 1913 prices. While Germany became a net debtor, the United States emerged as a major international lender. Foreign capital investments and flow from the United States increased from $ 43 million in 1921-29 to $ 78.1 million in 1930-38 at current prices.

But the decade of the 1950s witnessed important changes in international capital flow. The average volume of capital flow was about $ 2 billion per year between 1951-55 and $ 3.3 billion between 1956-61 at 1913 prices. But private capital flow were only 45 per cent of the total during the 1950s, the major being in the form of official donations, loans by governments and

international agencies. Another important feature of this decade was the emergence of the United States as the principal lender of the world. Between 1951-55, and 1956-61, the international flow of capital from the United States was $ 78.4 million and $ 67.4 million per year at current prices.

But these figures do not present a real picture because these international capital flow constituted small proportions of GNP of the creditor countries especially after the First World War. For instance, capital exports as a share of GNP of the United Kingdom were 5.3 per cent in 1900-14 which fell to 2.3 per cent in 1921-29 and further to 0.7 per cent in 1950-58. Similarly, for the United States, it fell from 2.0 per cent in 1909-28 to 0.4 per cent in 1929-38, rose to 0.9 per cent in 1946-50 and again fell to 0.5 per cent in 1950-59. Thus according to Kuznets, ‘“there was marked retardation in the expansion of international capital flow in the five-decade period after 1913 as compared with the century that preceded First World War.”

CONCLUSION

These six characteristics of modern economic growth are inter-related. They are inter-woven in a cause and effect sequence. Given a stable ratio of labour force to total population, there is a high rate of increase in per capita product which implies higher labour productivity. This in turn, leads to the great rise in per capita product and per capita consumption. The latter, in turn, is the result of advanced technology, and changes in the scale of production of plants, as a result the very character of enterprises changes. These, in turn, produce not only for the domestic market but also for the foreign markets. This is the sequence of modern economic growth that led to its outward spread and expansion in the developed countries before the First World War, between the two World Wars and in the 1950s.

PART - II
SOME THEORIES OF ECONOMIC DEVELOPMENT

CHAPTER

Adam Smith's Theory

THE THEORY

Adam Smith is regarded as the foremost classical economist. His monumental work, *An Enquiry into the Nature and Causes of the Wealth of Nations* published in 1776, was primarily concerned with the problem of economic development. Though he did not expound any systematic growth theory, yet a coherent theory has been constructed by later day economists which is explained below.

Natural Law. Adam Smith believed in the doctrine of 'natural law' in economic affairs. He regarded every person as the best judge of his self interest who should be left to pursue it to his own advantage. In furthering his own self interest he would also further the common good. In pursuance of this, each individual was led by an "*invisible hand'* which guided market mechanism. "It is not to the benevolence of the baker but to his self-interest that we owe our bread," said Smith. Since every individual if left free, will seek to maximise his own wealth, therefore all individuals, if left free, will maximise aggregate wealth. Smith was naturally opposed to any government intervention in industry and commerce. He was a staunch free trader and advocated the policy of *laissez-faire* in economic affairs. The "invisible hand" the automatic equilibrating mechanism of the perfectly competitive market tended to maximise national wealth.

Division of Labour is the starting point of Smith's theory of economic growth. It is division of labour that results in the greatest improvement in the productive powers of labour. He attributed this increase in productivity: (1) to the increase in the dexterity of every worker; (2) to the saving in time to produce goods; and (3) to the invention of large number of labour-saving machines.[1] The last cause of increase in productivity stems not from labour but from capital. It is improved *technology* that leads to division of labour and

the expansion of the market. But what leads to division of labour is a certain propensity in human nature—the propensity to truck, barter and exchange one thing for another. Division of labour, however, depends on the size of the market. One of his famous sayings that 'the division of labour is limited by the extent of the market' implies that the division of labour increases with the extension of the market. For this purpose, expansion of commerce and international trade is especially beneficial. With the increase in population and transport facilities, there is bound to be greater division of labour and increase in capital.

Process of Capital Accumulation. Smith, however, emphasized that capital accumulation must precede the introduction of division of labour. Like the modern economists, Smith regarded capital accumulation as a necessary condition for economic development. So the problem of economic development was largely the ability of the people to save more and invest more in a country. The rate of investment was determined by the rate of saving and savings were invested in full. But almost all savings resulted from capital investments or the renting of land. So only capitalists and landlords were held to be capable of saving. The labouring classes were considered to be incapable of saving. This belief was based on the 'Iron Law of Wages'. The classical economists also believed in the existence of a *wages fund.* The idea is that *wages* tend to equal the amount necessary for the subsistence of the labourers. If the total wages fund at any time becomes higher than the subsistence level, the labour force will increase, competition for employment will become keener and wages will come down to the subsistence level. In such a situation, some of the workers will find it difficult to pull on below an accustomed normal living standard. They will, therefore, be unable to marry or bring up children. The working force will be reduced and competition among the capitalists for employing workers would tend to raise wages. Thus, Smith believed that "under stationary conditions, wage rates fall to the subsistence level, whereas in periods of rapid capital accumulation, they rise above this level. The extent to which they rise depends both upon the rate of accumulation and upon the rate of population growth."[2] The wages fund was, however, built up of savings and was utilized for hiring labour through investments. He believed that savings found their way into investment more or less automatically. Thus the wages fund could be increased by increasing the rate of net investment.

Why do Capitalists Make Investments? According to Smith, investments were made because the capitalists expected to earn *profits* on them; and the future expectations with regard to profits depended on the present climate for investment as well as actual profits. But what is the behavior of profits during the development process? Smith believed that profits tended to fall with economic progress. When the rate of capital accumulation increases, increasing competition among capitalists raises wages and tends to lower profits. In fact, it is the increasing difficulty of finding new profitable investment outlets that leads to falling profits.

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1. Adam Smith,*An Inquiry into the Nature and Causes of the Wealth of Nations,* (ed.) E. Cannan, p. 7.

2. G.M. Meier and E. Baldwin, *op.cit.,* p. 23.

Regarding the role of interest rate in economic development, Smith wrote that with the increase in prosperity, progress, and population, the rate of interest falls, and as a result the supply of capital is augmented. The reason being that with the fall in interest rate, the moneylenders will lend more to earn more interest for the purpose of maintaining their standard of living at the previous level. Thus the quantity of capital for lending will increase with the fall in the rate of interest. But when the rate of interest falls considerably the moneylenders are unable to lend more in order to earn more to maintain their standard of living. Under the circumstances, they will themselves start investing and become entrepreneurs. Thus, even with the fall in the rate of interest, there is increase in capital accumulation and economic progress.

So far as *rent* is concerned, Smith believed that economic progress involves rise in money as well as real rentals, and a rise in rental share of national income. This is because the interests of landowners are closely connected with the general interest of society.

Agents of Growth. According to Smith, farmers, producers and businessmen are the agents of economic progress. It was free trade, enterprise and competition that led farmers, producers and businessmen to expand the market which, in turn, made economic development possible. The functions of these three are interrelated. To Smith, development of agriculture leads to increase in construction works, and commerce. When agricultural surplus arises as a result of economic development, the demand far commercial services and

manufactured articles rises. This leads to commercial progress and the establishment of manufacturing industries. On the other hand, their development leads to increase in agricultural production when farmers use advanced production techniques. Thus capital accumulation and economic development take place due to the emergence of the farmer, the producer and the businessman.

Process of Growth. "Taking institutional, political and natural factors far granted, Smith starts from the assumption that a racial group–we may call it a "nation"—will experience a certain rate of economic growth that is accounted for by increase in numbers and by saving. This induces a "widening of market" which is turn increases division of labour and thus increases productivity... In this theory the economy grows like a tree. This process is no doubt exposed to disturbances by external factors, that are not economic,...but in itself it proceeds steadily, continuously. Each situation grows out of the preceding one in a uniquely determined way, and the individuals whose acts combine to produce each situation count individually for no more than the individual cells of a tree."[3] According to Smith, this process of growth is cumulative. When there is prosperity as a result of progress in agriculture, manufacturing industries and commerce, it leads to capital accumulation, technical progress, increase in population, expansion of markets, division of labour and rise in profits continuously. All this happens in Smith's *progressive state* which "is in reality the cheerful and the hearty state to all the different orders of the society."

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3. Richard V. Clemence, (ed.) *Essays of J.A. Schumpeter,* pp. 232-33. Italics mine.

Stationary State. But this progressive state is not endless. It ultimately leads to a stationary state. It is the scarcity of natural resources that finally stops growth. In such an opulent state, the competition for employment would reduce wages to the subsistence level and competition among businessmen would bring profits as low as possible. Once profits fall, they continue to fall. Investment also starts declining and in this way the end result of capitalism is the stationary state.

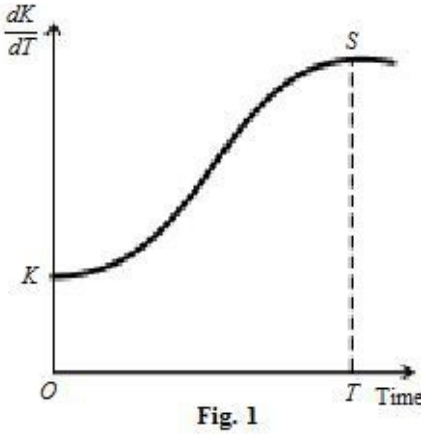

Fig. 1

When this happens, capital accumulation stops; population becomes sationary; profits are the minimum; wages are at the subsistence level; there is no change in per capita income and production, and the economy reaches the state of stagnation. According to Smith, the stationary state is dull, the declining melancholy. Life is hard in the stationary state for the different sections of the society and miserable in the declining state. All this happens in a free market economy.

Smith's theory is explained in terms of Fig.1 where time is taken on the horizontal axis and rate of accumulation, *dK/dT* , on the vertical axis. The economy grows from K to S during the time path T. After T, the economy reaches the stationary state linked to S where further growth does not take place because wages rise so high that profits become zero and capital accumulation stops.

A CRITICAL APPRAISAL

Smith's theory has the great merit of pointing out how economic growth came about and what factors and policies impede it. In particular, he pointed out the importance of parsimony in saving and capital accumulation; of improved technology, division of labour and expansion of market in production; and of the process of balanced growth in the interdependence of farmers, traders and producers. Despite these merits, it has certain *weaknesses.*

1. Rigid Division of Society. Smith's theory is based on the socio-economic environment prevailing in Great Britain and certain parts of Europe. It assumes the existence of a rigid division of society between capitalists (including landlords) and labourers. But the middle class occupies an important place in modern society. Thus, this theory neglects the role of the middle class which provides the necessary impetus to economic development.

2. One-sided Saving Base. According to Smith, capitalists, landlords and moneylenders save. This is, however, a one-sided base of savings because it did not occur to him that the major source of savings in an advanced society was the income-receivers and not the capitalists and landlords.

3. Unrealistic Assumption of Perfect Competition. Smith's whole theory is based upon the unrealistic assumption of perfect competition. This *laissez-faire*

policy of perfect competition is not to be found in any economy. Rather, a number of restrictions are imposed on the private sector, and on internal and international trade in every country of the world.

4. Neglect of Entrepreneur. Smith neglects the role of the entrepreneur in development. This is a serious defect in his theory. The entrepreneur is the focal point of development, as pointed out by Schumpeter. It is the entrepreneur who organises and brings about innovations thereby leading to capital formation.

5. Unrealistic Assumption of Stationary State. Smith is of the view that the end result of a capitalist economy is the stationary state. It implies that there is change in such an economy but around a point of equilibrium. There is progress but it is steady, uniform and regular like a tree. But this explanation of the process of development is not satisfactory because development takes place by 'fits and starts' and is not uniform and steady. Thus the assumption of the stationary state is unrealistic.

6. Static Model. According to Hicks, Smith's model, though it looks like a growth model, is not a growth model in the modern sense. It does not exhibit a sequence.[4] Thus it is a static model.

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4. J. Hicks, *Capital and Growth* , 1965.

ITS APPLICABILITY TO UNDERDEVELOPED COUNTRIES

The Smith theory of economic development has limited validity for underdeveloped countries. In such economies, the size of the market is small. As a result, the capacity to save and inducement to invest are low The size of the market is determined by the volume of production. This in turn depends on the level of income. 'Capacity to buy means capacity to produce' here. And productivity, to a certain extent, depends on the degree to which capital is employed in production. Since the size of the market is small, productivity is low, and low productivity implies low level of income. The low level of income results in small capacity to save and inducement to invest and they keep the size of the market small. To use the Keynesian terminology, the level of real income is low in underdeveloped countries but the propensity to consume

is very high and every increase in income is spent on food products. Little is saved and invested. The volume of production remains at a low level. Consequently, the size of the market remains small.

Moreover, political, social and institutional assumptions underlying Smith's theory are not applicable to the conditions prevailing in underdeveloped countries.*Laissez-faire* has lost its significance in such economies. Competition has been gradually replaced by monopoly which has tended to perpetuate and strengthen the vicious circles of poverty. Therefore, development is possible through government intervention rather than through a policy of *laissez-faire.,*

Conclusion. Despite this, Smith's theory of economic development points toward certain factors that are helpful in the process of developing underdeveloped countries. Farmers, traders and producers, the three agents of growth mentioned by Smith, can help in developing the economy by raising productivity in their respective spheres. In the absence of a free market economy, the state can induce them to produce more, as is being done in India. Their interdependence also points toward the importance of balanced growth for such economies.

In particular, Smith extolled the virtues of saving which is regarded as a crucial factor for capital formation in underdeveloped countries. He wrote, "Every prodigal appears to be a public enemy and every frugal man a public benefactor."

Further, his emphasis on improved technology, division of labour and expansion of market in the process of development has become the corner stone of policy in such countries. As aptly remarked by Rostow, indeed looked at from the present day, the *Wealth of Nations* is a dynamic analysis, and programme of policy for an underdeveloped country.

CHAPTER

The Ricardian Theory

INTRODUCTION

Like Smith, David Ricardo also presented his views on economic development in an unsystematic manner in his book *The Principles of Political Economy and Taxation*. This book was published in 1917. It was its third edition of 1921 and Ricardo's correspondence with a number of economists that contain his ideas on which his model of development has been built.

RICARDO'S THEORY

Ricardo never propounded any theory of development. He simply discussed the theory of distribution. Therefore, Ricardo's analysis is a detour. The Ricardian theory is based on the marginal and the surplus principles. The marginal principle explains the share of rent in the national output, and the surplus principle explains the division of the remaining share between wages and profits.

Assumptions of the Theory. The Ricardian theory is based on the following assumptions:

(*i*) All land is used for the production of corn and the working forces in agriculture help in determining distribution in industry.

(*ii*) The law of diminishing returns operates on land.

(*iii*) The supply of land is fixed.

(*iv*) The demand for corn is perfectly inelastic.

(*v*) Labour and capital are variable inputs.

(*vi*) Capital consists of circulating capital.

(*vii*) There is capital homogeneity.

(*viii*) The state of technical knowledge is given.

(*ix*) All workers are paid a subsistence wage.

(*x*) The supply price of labour is given and constant.

(*xi*) The demand for labour depends upon the accumulation of capital, and both demand and supply price of labour are independent of the marginal productivity of labour.

(*xii*) There is perfect competition.

(*xiii*) Capital accumulation results from profits.

THE THEORY

Given these assumptions, the whole economy consists of one huge farm fixed in supply which is engaged in producing only corn by applying homogeneous units of labour and capital. It grows on the basis of interrelations of *three groups* in the economy, They are landlords, capitalists and labourers among whom the entire produce of land is distributed. The total national output is distributed among the three groups as rent, profits, and wages respectively.

Division of Rent, Profits and Wages. Given the total output of corn, the share of each group can be determined.*Rent* per unit of labour is the difference between the average and marginal product. Or, total rent equals the difference between the average product and the marginal product of labour × (multiplied by) the quantity of labour and capital applied on land. The *wage rate* is determined by wage fund ÷ (divided by) the number of workers employed at the subsistence level. Thus out of total corn produced and sold, rent has the first right and the residual (produce *minus* rent) is distributed between wages and profits, while interest is included in profits.[1]

Process of Capital Accumulation. According to Ricardo, capital

accumulation is the outcome of profits because profits lead to saving of wealth which is used for capital formation. Capital accumulation depends on two factors: *First*, the capacity to save; and *second*, the will to save. The capacity to save is more important in capital accumulation. This depends upon the *net* income of society which is a surplus out of total output after meeting the cost of workers' subsistence. The larger is the surplus, the larger will be the capacity to save. As Ricardo said, "Out of two loaves I may save one, out of four I may save three." Landlords and capitalists invest through this surplus. The size of this surplus of net income depends on the rate of profit.

(*i*) The Profit Rate. The rate of profit = profits/wages *i.e.*, the rate to profit is equal to the ratio of profits to capital employed. But since capital consists only of working capital, it is equal to the wage bill. So long as the rate of profit is positive, capital accumulation will continue. The labour force will grow proportionately and the total wage fund will also increase. In reality, profits depend on wages, wages on the price of corn and the price of corn depends on the fertility of the marginal land. In this way, there is an inverse relation between profits and wages, and wages rise or fall in keeping with the price of corn. When there are improvements in agriculture, the productive power of land increases, or by applying better machines less workers produce more output. This results in fall in the price of corn. As a result, the subsistence wage also falls, but profits increase and there is more capital accumulation. This will increase the demand for labour and the wage rate will rise. This, in turn, will increase population and the demand for corn and its price. Thus wages will rise and profits decline.

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1. See Fig. 1. for its clarity.

(*ii*) Increase in Wages. Ricardo tried to show that it is only under different conditions that capital accumulation will reduce profits. In the Ricardian system, wages play an active role in determining income between capital and labour. The wage rate increases when the prices of commodities forming the subsistence of the workers increase. The commodities consumed by workers are primarily agricultural products. As the demand for food increases, less fertile land is brought under the plough. For this purpose, to produce a unit of the product more labourers are required. The demand for labour starts rising which raises wages. Moreover, to match the increasing cost of subsistence,

money wages will also continue to rise. Thus wages rise with the increase in the price of corn and then profits decline. In such a situation, rent also increases which absorbs the rise in the price of corn. Since wages also increase, profits decline. These opposite tendencies ultimately retard capital accumulation.

(*iii*) Declining Profits in Other Industries. According to Ricardo, "The profits of the farmer regulate the profits of all other trades." Therefore, the money rate of profit earned on capital must be equal in equilibrium both in agriculture and industry. In manufacturing industry, corn is used as an input and the equality in the rate of profit comes through a definite relationship between the prices of industrial goods and the price of corn. Thus, when the profit rate declines in the agricultural sector, it also declines in the manufacturing industry. For with the rise in the price of corn, the industry will have to raise the wages of labourers, thereby reducing profits. Thus the price of corn determines the rate of profit in industry. When profits decline in the agricultural sector, profits of all trades also decline.

Other Sources of Capital Accumulation. According to Ricardo, economic development depends on the difference between production and consumption. He, therefore, lays emphasis on increasing production and reducing unproductive consumption. However, the productivity of labour may be, increased through technological changes and better organisation. It is in this way that capital accumulation also can be increased. But the use of more machines will employ less workers. This will lead to unemployment and reduced wages. Since the economic condition of the workers worsens with the employment, of more machines, Ricardo regards technological conditions as given and constant.

(*i*) *Taxes* are a source of capital accumulation in the hands of the government. According to Ricardo, taxes are to be levied only to reduce conspicuous consumption. Otherwise, the imposition of taxes on capitalists, landlords, and labourers will transfer resources from these groups to the government. But taxes adversely affect investment. Therefore, Ricardo does not favour the imposition of taxes because taxes reduce income, profits and capital accumulation.

(*ii*) Ricardo is in favour of *free trade* . Free trade is an important factor for the

economic development of the country. The profit rate can be saved from declining by importing corn. The capital accumulation will, therefore, continue to be high. In this way, the resources of the world can be used more efficiently through foreign trade. But the import of corn leads to fall in the demand for labour which deteriorates the economic condition of labourers. On the other hand, landlords and capitalists do not think it fit to import cheap corn from foreign countries, as a result their profits decline.

Ricardo's theory has been illustrated in Fig. 1 where quantities of corn are measured on the vertical axis and the amount of labour employed in agriculture on the horizontal axis. The curve *AP* represents the average product of labour and curve *MP* the marginal product of labour. With *OM* amount of labour, *OQRM* total corn is produced. Rent is shown by the rectangle *PQRT*, as the difference between *AP* and *MP*. At the subsistence wage rate *OW*, the supply curve of labour *WL* is infinitely elastic, and the total wage bill is *OWLM*. Total profits, *WPTL*, are the residue after deducting rent and wages from the total output:

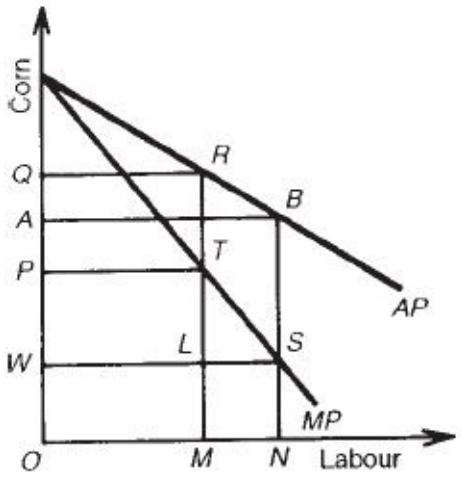

Fig. 1

WPTL = OQRM – (PQRT – OWLM).

Stationary State. According to Ricardo, there is a natural tendency for the profit rate to fall in the economy so that the country ultimately reaches the stationary state. When capital accumulation rises with increase in profits, total output increases which raises the wages fund. With the increase in the wages fund, population increases which raises the demand for corn and its price. As population increases, inferior grade lands are cultivated to meet the increasing demand for corn. Rents on the superior grades of land rise and absorb a greater share of the output produced on these lands. This reduces the share of capitalists and labourers. Profits decline and wages tend to fall to the subsistence level. This process of rising rents and declining profits continues till output from the marginal land just covers the subsistence wage of the labour employed. Then profits are zero. This situation is explained in the above figure. During the course of capital accumulation, the amount of labour increases from *OM to ON* and the total output from *OQRM to OABN*. Of this,

OWSN is the total wage bill (fund) and *WABS* is the rent. There are no profits at all. The stationary state arrives. In this state, capital acumulation stops, population does not grow, the wage rate is at the subsistence level and technical progress ceases. “The basic causal force in this scheme is the fact of diminishing returns in agriculture, a grim tendency which can only be postponed temporarily by technical progress.*But* technical progress can not prevent the ultimate disappearance of profit and the onset of the stationary state.”.

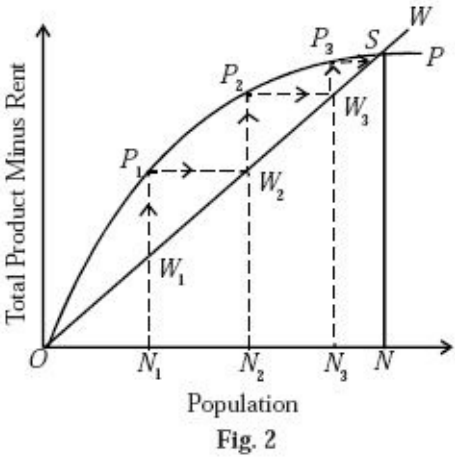

Fig. 2

The movement towards the stationary state in the Ricardian model is explained in terms of Fig. 2. Population is measured along the horizontal axis and total product minus rent on the vertical axis. The curve *OP* is the production function which shows total produc minus rent as the function of population. As population increases, the *OP* curve flattens out due to the operation of the lawof diminishing returns. The ray through the origin *OW* measures the constant real wage rate. The vertical distance between the horizontal axis and the wage rate line *OW* measures the total wage bill at different levels of population. Thus W_1N_1, W_2N_2, and W_3N_3 are the total wage bills at ON_1, ON_2, and ON_3 levels of population. When the wage bill is W_1N_1 the profits are P_1W_1 (Total product minus rent ÷ total wage bill, *i.e.*, $P_1\ N_1 \div W_1\ N_1 = P_1W_1$). Whenprofits are P_1W_1, investment is encouraged. The demand for labour increases to ON_2 which pushes up the wage bill to W_2N_2 but profits decline *to* P_2W_2. This will encourage further investment and technical progress and raise the demand for labour to ON_3 and the wage bill will also increase to W_3N_3. But the profits will decline to P_3W_3. This process of capital accumulation, increase in population and the wage bill will continue till profits disappear altogether at point *S* from where the stationary state sets in.

A CRITICAL APPRAISAL

Ricardo was the forerunner of modern economists and his ideas on economic development have been adopted by them. He emphasised the importance of

raising savings and profit rate for capital accumulation. But it has certain flaws which are discussed below:

1. Neglects the Impact of Technology. Ricardo pointed out that improved technology in the industrial field leads to the displacement of labour and other adverse consequences. In the beginning, technological progress might counteract the action of diminishing returns. But ultimately when the impact of technological progress is exhausted, diminishing returns set in and the economy moves towards the stationary state. Thus, the Ricardian theory is primarily based on the law of diminishing returns. Rapid increase of farm produce in the advanced nations has proved that Ricardo underestimated the potentialities of technological progress in counteracting diminishing returns to land. Ricardo gave unnecessary importance to the law of diminishing returns and failed to visualize the important impact that science and technology had on the rapid economic development of the now developed nations.

2. Wrong Notion of Stationary State. The Ricardian view that the state reaches the stationary state automatically is baseless, because no economy attains the stationary state in which profits are increasing, production is rising and capital accumulation is taking place.

3. Baseless Notion Regarding Population. The Ricardian view that the wage rate does not increase with the rise in population has been disproved. *First,* the Malthusian theory of population has been proved wrong by population trends prevailing in the Western world. *Second,* wages have not tended to be at the subsistence level. Rather, there has been a continuous increase in money wages, and population has tended to decline.

4. Impracticable Laissez-Faire Policy. The Ricardian theory is based on the impracticable notion of *laissez-faire.* According to this policy, there is no government interference and the economy operates automatically through perfect competition. In reality, there is no economy which is free from government interference and in which perfect competition prevails.

5. Neglects Institutional Factors. One of the principal defects of the Ricardian theory is that it neglects the role of institutional factors. They have been assumed as given. But they are crucial in economic development and cannot be overlooked.

6. Distribution Rather than Growth Theory. According to Schumpeter, the Ricardian theory is not a growth theory but a theory of distribution which determines the shares of workers, landlords and capitalists. Even in this, he regards the share of land as primary, and the residual as the share of labour and capital. Ricardo failed to present a *functional* theory of distribution because he did not determine the share of each factor separately.

7. Land also Produces Goods other than Corn. Ricardo believed that only one product corn is produced on land. But this is an old notion because land produces a variety of products other than corn. This view appears to be still obsolete when Ricardo opined that the other factors of production are supported only by the produce of land.

8. Capital and Labour not Fixed Coefficients. The Ricardian assumption that capital and labour are fixed coefficients of production, is not correct. This assumption is invalid because labour and capital are independent variables.

9. Neglects the Interest Rate. The most serious defect of the Ricardian theory is the neglect of the rate of interest in economic growth. He does not regard the interest rate as an independent reward of capital but includes it in profits. This wrong notion stems from his inability to distinguish between the capitalist and the entrepreneur.

10. Static Model. According to Hicks, Ricardo uses the static method for the analysis of a dynamic process by confining himself to circulating capital and capital homogeneity. The Ricardian model is not one of a regularly progressive economy. It is confined to the comparison of static equilibria of even stationary states, and therefore cannot be extended to the analysis of a dynamic process.[2]

UNDERDEVELOPED COUNTRIES AND RICARDO'S THEORY

Despite these weaknesses, the Ricardian theory points toward the importance of capital accumulation through agricultural development, and increase in the various sources of savings and the profit rate. The Ricardian theory may not be fully applicable to underdeveloped countries but it does point out the factors

that retard their rate of economic growth. The two basic assumptions of the Ricardian theory, diminishing returns to land and the Malthusian principle of population, are of particular significance for understanding the problems of over-populated underdeveloped economies.

In an underdeveloped country, population increases faster than the increase in food supply. There is land hunger but there is the absence of technical improvements on land. As a result, the law of diminishing returns works with full force and productivity falls. The supply of cultivable land being scarce in relation to its demand, rents are high. But wages are low, because the labour supply is in excess of its demand and there is little tendency to substitute capital for labour. Under such circumstances, the level of income is low and there is little capacity to save and inducement to invest and the rate of capital accumulation is low.

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2. J. Hicks, *Capital and Growth* , 1965.

CHAPTER

The Malthusian Theory

INTRODUCTION

Thomas Robert Malthus, with whose name the famous **Malthusian Theory of Population** is associated, 'showed more appreciation than most of his contemporaries of the importance of distinct and systematic theory of growth.'[1] His ideas about economic development are found in Book II entitled "*The Progress of Wealth*" of his *Principles of Political Economy* published in 1820.[2]

THE THEORY

Concept of Development. Malthus did not regard the process of economic development as automatic. Rather, it required consistent efforts on the part of the people. He did not conceive of any movement towards the stationary state but emphasised that the economy reached the slump many times before attaining the optimum level of development. Thus for him, the process of development was one of ups and downs of economic activity rather than smooth.

Malthus was concerned with the "progress of wealth" of a country. By

progress of wealth, he meant economic development which could be achieved by increasing the wealth of a country. The wealth of a country depended partly upon the quantity of produce obtained by its labour, and partly upon the valuation of this produce. But "the, wealth of country does not always increase in proportion to increase in value, because an increase in value may sometimes take place under an actual diminution 6f commodities."

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1. B. Higgins, *Economic Development,* p. 99.

2. T.R. Malthus, *Principles of Political Economy,* 2/e, 1836. Reprinted 1951.

Population Growth and Economic Development. In his *Principles of Political Economy,* Malthus was more realistic in his analysis of population growth in the context of economic development than in his *Essay of Population.* According to him, population growth by itself is not sufficient to bring about economic development. Rather, it is the result of the development process. As Malthus wrote: "An increase of population cannot take place without proportionate increase of wealth." As the rate of capital accumulation increases, the demand for labour also increases. This encourages population growth. But mere population growth does not increase wealth. Population growth increases wealth only if it increases effective demand. And it is increase in effective demand which leads to increase in wealth.

Role of Production and Distribution. Malthus regarded production and distribution as "the two grand elements of wealth." If they are combined in right proportions, they can increase the wealth of a country in a short time. But if they are taken separately or combined in undue proportions, they may take many thousand years to increase wealth. So Malthus emphasises maximum production and optimum allocation of resources for increasing the wealth of a country during the short run.

Factors in Economic Development. Malthus defined the problem of economic development as one of explaining the difference between potential gross national product (power of producing riches) and acutal gross national product (actual riches). But the principal problem is one of achieving a high level of potential gross national product.

According to Malthus, the size of potential gross national product depends

upon land, labour, capital and organisation. When these four factors are employed in right proportions, they maximise production in the two minor sectors of the economy viz., the agricultural and the industrial secor. It is the accumulation of capital, the fertility of the soil and technological progress that lead to increase in both agricultural and industrial production. Besides these, **Malthus** also emphasized the importance of non-economic factors in economic development "which come under the head of politics and morals." They are the security of property; good constituiion and excellent laws properly administered; and hard working and regular habits and general rectitude of character.

Process of Capital Accumulation. Of all the factors, it is the accumulation of capital which is the most important determinant of economic development. The source of capital accumulation is higher profits. Profits come from the savings of capitalists because workers are too poor to save. If capitalists save more and spend less on consumer goods in order to have larger profits, economic growth will be retarded.

In fact, Malthus suggested a concept of the "optimum propensity to save." To Malthus this meant "saving from the stock which might have been destined for immediate consumption, and adding to that which is to yield a profit; or in other words in the conversion of revenue into capital." Thus his conclusion is that 'saving, pushed to excess, would destroy the motive to production."

Deficiency of Effective Demand. This view of Malthus is based on his denial of *Say's Law of Markets* and belief in the deficiency of effective demand. Malthus does not agree with Say that there cannot be a general over production or glut in the market. According to him, it is not at all true tha't commodities are always exchanged for commodities. In fact, the great mass of commodities is exchanged directly for labour rather than for commodities. Since workers, who are consumers, receive less than the value of the product they produce, they cannot buy all commodities. Thus, there is an excess supply of commodities in the market in relation to the demand. This gap between supply and demand cannot be filled even by the demand of capitalists. Capitalists believe in parsimony and "deprive themselves of their usual conveniences and luxuries to save from their revenue and add to their capital". By being parsimonious, they employ more productive workers who are consumers and, in turn, are not able to buy all commodities they produce. Thus there is general

over-production and glut of commodities in the market due to the deficiency of effective demand or under-consumption. This leads to fall in prices, profits, saving, investment and capital accumulation.

Economic Stagnation. Malthus believed that the supply of labour is inelastic in the short run. He wrote: "From the nature of population, an increase of labourers cannot be brought into the market, in consequence of a particular demand, till after the lapse of sixteen or eighteen years." But the supply of capital can be increased faster than increase of population. As capitalists invest on productive labour to increase the supply of capital, wages rise due to competition. Rise in wages do not increase effective demand because workers prefer leisure to increased consumption. So there is a general glut of commodities. As a result, prices fall, profits decline, investment falls, and both the power of accumulation and the motive to accumulate are strongly checked. Thus gluts and under consumption would lead to economic stagnation.

MEASURES TO PROMOTE ECONOMIC DEVELOPMENT

Malthus made several policy recommendations to promote economic development:

(1) *Balanced Growth.* In the Malthusian system, the economy is divided into agricultural and industrial sectors. It is technological progress in these two sectors that can lead to economic development. Capital is invested in agriculture until all the arable land is brought under cutivation, stocked and improved. After that there are no more opportunities for profitable investment in that sector due to diminishing returns. Therefore, investment opportunities exist only in the industrial sector. Diminishing returns to increased employment in the land can be avoided only if technical progress in the industrial sector is rapid enough, and if investment takes place to absorb most of the population growth in the industrial sector and to reduce the cost of living of workers on the land, permitting reduction in their wage rates.[3] Thus, Malthus favoured balanced growth of both—agricultural and industrial sectors for—economic development of the country.

(2) *Raising Effective Demand.* But technical progress alone cannot lead to economic development unless effective demand increases. Malthus suggested a

number of measures to increase effective demand.

First, by more *equitable distribution of wealth and landed property.* "Thirty or forty proprietors with income averaging between one thousand and five thousand a year, would create a much more effective demand for wheat, bread, good meat, and manufactured products, than a single proprietor possessing a hundred thousand a year:" Thus Malthus believed that a few moderately rich people can raise effective demand more than one millionaire among the poor masses. Further, he favoured a more equitable distribution of landed property for that would increase effective demand, as well as, production. According to Malthus, if the division of land into small proprietors, is carried to an extreme, it would adversely affect the production.

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3. B. Higgins,*op: cit., p.* 103.

Second, effective demand can be increased by the *expansion of internal and external trade.* It is internal as well as external trade that increases wants and tastes and the desire to consume, "which are absolutely necessary to keep up the market prices ot commodities and prevent the fall of profits." Internal and external trade also increases the value of products by exchanging "what is wanted less for what is wanted more".

Third, Malthus suggested the maintenance of "unproductive consumers" to increase effective demand. He defined unproductive consumers as those persons who did not produce material objects. It is under-consumption which leads to gluts and stagnation in the country. Therefore, production can be raised by increasing consumption. Since capitalists are parsimonious and productive workers live upon subsistence wages, "unproductive consumption" upon the part of unproductive labourers and landlords will increase effective demand.

Lastly, Malthus suggested public works schemes to remove unemployment and increase effective demand. Malthus pointed out that "the employment of the poor in roads and public works and a tendency among landlords and persons of property to build, to improve and to beautify their grounds, and to employ workmen and menial servants, are the means . . .to remedy the evils arising from that disturbance in the balance of produce and consumption." But he

himself noted two weaknesses of this measure.

(i) it might prevent labour from "gradually accommodating itself to a reduced demand." He thought that it could be remedied by giving low wages to workers.

(ii) it would necessitate increase in taxes to finance public works which would reduce private investment.

But this weakness was in fact the advantage of public works because it would not have the tendency to diminish the capital employed by productive labour.

Stationary State. According to Malthus wage has the tendency to maintain the living standard stable so that families of workers can subsist on this. Whenever the wage rate is more than the minimum, the working population will increase at a fast rate because the labour power will grow and the living standard will be high. Ultimately, the tendency of diminishing returns will apply and the demand and supply sustenance level. It can be said that in a progressive system, there is high level of investment that generally helps in raising total production which keeps the wages high and further increases the population. As the quantity of level is fixed, additional labour force leads to diminishing returns. When population increases, wage reduces the profitability of investment till the propensity to invest does not end and the economy reaches the stationary state.

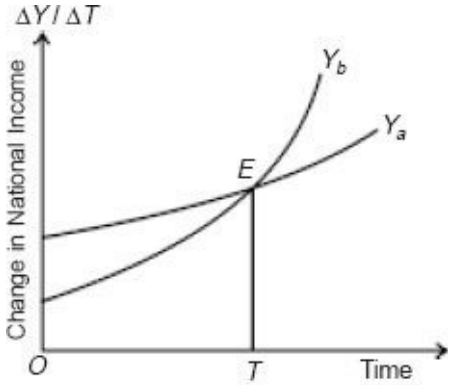

Fig. 1

Malthus' stationary state is depicted in Fig. 1. Where *SW* is the standard of living line and the curve $LL_1$is the real living standard which reflects the quantity of population in relation to constant quantity of other resources. The shape of the LL_1 curve shows that in the initial stage population increases alongwith wage which leads to high standard of living. The highest level of this curve is *M* where the optimum population is *OP* and *PM* is high living standard. After point *M*, the *LL* curve slopes downward. This is because when population increases alongwith constant other resources, there is the tendency of diminishing returns.

According to Malthus when the working population is at the subsistence level, there is no tendency of its increasing or decreasing. In the figure, *OS* is the level of living standard at which OP_1 is the equilibrium level of population. It population increases beyond OP_1, the real living standard will be below the subsistence level. Population will decline and the subsistence level will rise. If, on the other hand, population declines below OP_1, the real living standard will be higher than the subsistence level which will lead to increase in population and the real living standard will fall. In this way, the subsistence level will reach the stationary state in the long run.

Conclusion. To sum up, in the Malthusian theory it is underconsumption or deficiency in effective demand leading to gluts which is the main cause of underdevelopment. For development, the country should maximise production in the agricultural and industrial sectors of the economy. This requires technical progress, equitable distribution of wealth and land, expansion of internal and external trade, increase in unproductive consumption, and increase in employment opportunities through public works schemes. Besides, there are non-economic factors like education, moral standards, hard working habits, good administration and efficient laws which help in increasing production in the two sectors of economy. Thus these economic and non-economic factors lead to economic development.

A CRITICAL APPRAISAL

Keynes "claimed Robert Malthus as the first of the Cambridge Economists." Rightly so. For he was Keynes's precursor. He also anticipated Kalecki. It was Malthus who denied Say's Law of Markets and laid emphasis upon the importance of effective demand. He pointed out the factors which hinder and promote economic development. In particular, he pointed out the importance of technological progress, equitable distribution of wealth, internal and external trade, public works programme, good administration, hardwork, and balanced growth. These measures have come to be recognised as the main planks of modern economic growth.

Despite all these virtues, Malthus's theory has certain weaknesses:

1. Secular Stagnation not Inherent in Capital Accumulation. Malthus argues

that the process of capital accumulation leads inherently to secular stagnation. This is a wrong notion which arises from his interpretation of Say's law. For Malthus there is the possibility of permanent underconsumption of all commodities. But the fact is that underconsumption is not a permanent phenomenon but a temporary one. So secular stagnation is not inherent in the process of capital accumulation.

2. Negative View of Capital Accumulation. Malthus's view that capital accumulation leads inherently to secular stagnation, is not correct from another angle. In actuality, capital accumulation does not lead to a reduction in the demand for consumer goods and fall in profits. As capital accumulation increases, the share of wages and profits in aggregate income increases, and so does the demand for consumer goods. Thus Malthus had a negative view of the process of capital accumulation.

3. Commodities not Exchanged for Commodities Directly. Again, Malthus, in denying Say argues that commodities are not exchanged for commodities, but they are exchanged for labour. In fact, labour is not a correct measure of commodities. In the real world, commodities are measured by real tangible prices and not by labour.

4. Unproductive Consumers Retard Progress. Another serious weakness of Malthus's theory is that he suggests spending by "unproductive consumers" to overcome underconsumption and increase effective demand. This remedy tantamounts to giving doles to workers and deliberately supporting idle persons. Such a measure slows down the rate of capital accumulation.

5. One-Sided Saving Base. Like Smith, Malthus had a one-sided base of savings. He believed that it is only the landlords who save. But this is an erroneous view because the major source of savings in a society is the income-earners and not profit-earners.

ITS APPLICABILITY TO UNDERDEVELOPED COUNTRIES

Malthus was one of the pioneers in the field of economic development who wrote about the poverty and underdevelopment of underdeveloped countries of his times in his *Principles of Political Economy.* He wrote about the economic backwardness of such countries as Spain, Portugal. Hungary, Turkey, Ireland,

together with nearly the whole of Asia and Africa, and of Latin American”countries. Hence his theory of economic development has more relevance to underdeveloped countries of today than the theories of other classical writers.

Malthus’s division and analysis of an economy into the agricultural sector and the industrial sector is highly realistic in the context of underdeveloped countries. Underdeveloped countries are duaistic economies where the agricultural sector lags behind the industrial sector. Despite technological progress the former sector is subject to the Law of Diminishing Returns. The latter sector operates under the law of increasing returns. Consequently, the agricultural sector retards the progress of the industrial sector.

His analysis of the causes of poverty is highly realistic in the context of the present day underdeveloped countries. For him, poverty of the peasantry is not due to the scarcity of fertile land. It is found because peasants do not have capital to make improvements on land. On the other hand, large landowners do not practise intensive cultivation due to the small size of the market. Since the bulk of the population subsists on labour-intensive agriculture. It is poor. Therefore, its demand for industrial output is low. The industrial sector remains limited in size and it fails to provide sufficient employment. Thus each sector acts as a drag on the growth of the other. Consequently peasants, landlords, workers and industrialists have a backward sloping supply curve of effort.

The above analysis of Malthus appears like the conditions prevailing in any backward country of Asia, Africa or Latin America.

The relation which Malthus established between population growth and econoinic development is fully applicable to underdeveloped countries. According to him, in countries where population alone increases, the increase in wealth is the slowest. This has amply proved true in the Asian and African countries.

The views of Malthus relating to factors which promote development are fully applicable to underdeveloped countries. None can deny the role of production, optimum distribution, capital accumulation, the fertility of soil, and technological progress, and of such non-economic factors as good

administration, excellent laws, hardwork, honesty of character, etc. in promoting the development of such countries.

Besides, some of the policy measures suggested by Malthus are also applicable to underdeveloped countries. He stressed the importance of structural changes to diminish the relative importance of agriculture; of land reforms; of balanced growth of agriculture and industry; of expanding internal and external trade to widen the$_X$ market; of equitable distribution of wealth and land; and of public works programme. These measures are found in the development plans of all underdeveloped countries.

But there are certain portions in the Malthusian theory which are not applicable to underdeveloped countries.

First, the Malthusian theory of underconsumption does not have any relevance to such countries. In the Malthusian analysis underconsumption implies an abundance of non-marketable goods due to deficiency of effective demand. In the case of underdeveloped countries, it refers to the low level of consumption due to low level of production.

Second, Malthus maintained that lack of effective demand was due to parsimony of capitalist. The remedy, he suggested, was "unproductive consumption" on the part of capitalists and unproductive workers. All these are not applicable to conditions prevailing in underdeveloped countries. In an underdeveloped country, income levels are extremely low, propensity to consume is very high and savings are negligible. Here the problem is not of raising effective demand through increased consumption, for it will lead to inflation. Rather, the problem is to raise the levels of employment, income, and saving for development.

CHAPTER

Mill's Theory

INTRODUCTION

John Stuart Mill, the eldest son of James Mill, was known to his contemporaries as an infant prodigy. He learnt Greek at the age of three; arithmetic and history at the age of six; Latin at the age of eight; logic at the age of twelve; economics at the age of thirteen; and Benthamite political philosophy at the age of fifteen. He read and learnt all this at home under his father, James Mill, and acquired the habit of going for walks with him and narrating to him what he had read the previous day. Ricardo was a close friend of James Mill at whose instigation he had written his*Principles of Political Economy and Taxation.* So John Stuart Mill knew Ricardo personally, visited him and as a child had been taken on walks by the latter. Naturally, he became the defender of Ricardian doctrines against critics. In 1848, Mill published his *Principles of Political Economy with Some of their Applications to Social Philosophy.*[1]This book saw seven editions during Mill's life-time, and was the accepted text book both in British and American universities for about 50 years when Marshall's*Principles of Economics* (1890) replaced it by 1900.

1. Its 7th edition, 1871, ed., W.J. Ashley, was first published in 1909. Also available in *Collected Works of John Stuart Mill,* Vols. II and III, ed., J.M. Robson. 1965.

THE THEORY

Mill regarded economic development as a function of land, labour and capital. While land and labour are the two original factors of production, capital is "a stock, previously accumulated of the products of former labour." Increase in wealth is possible only if land and capital help to increase production faster than the labour force. Wealth consists of tools, machines, and skills of the labour force. It is productive labour that is productive of wealth and of capital accumulation. "The rate of capital accumulation is a function of the proportion of the labour force employed productively . Profits earned by employing unproductive labour are merely transfers of income; unproductive labour does not generate *wealth or income"*. It is the productive labourers who do productive consumption. Productive consumption is that "which goes to maintain and increase the productive powers of the community." It implies that productive consumption is an input necessary to maintain productive labourers.

Control of Population Growth. Mill believed in the Malthusian Theory of Population. By population he meant the number only of the working class. He was, therefore, worried about the growth in number of productive labourers who worked for hire. He believed that population control was essential for improving the conditions of the working class so that they might enjoy the fruits of technological progress and capital accumulation. He propagated birth control as against moral restraint.

Wages Fund. According to Mill, the elasticity of supply of labour is very high in response to a rise in wages. Wages generally exceed the minimum subsistence level. Wages are paid out of capital. Hence they are limited by the existing fund of capital meant for paying wages. Thus wage per head can be arrived at by dividing the total circulating capital by the working population. Wages can increase by an increase in the aggregate fund of capital employed in hiring labour or by a decrease in the number of workers. If wages rise, supply of labour will be high. Competition among workers will not only bring down wages but also keep some labourers out of employment.

This is explained in Fig. 1 where *D* is the demand curve for labour. It is determined by the marginal product of labour. The supply of labour is given

by *S*. When the labour is scarce relative to land and other means of production, the supply curve is *S'* and the equilibrium wage is *OW'*. When labour is abundant relative to the means of production, the supply curve is *S"* and the equilibrium wage is *OW"*. The initial equilibrium is at point *E'* where *D* and *S'* curves intersect at a higher wage rate *OW'* and the supply of labour is *OL'*. But the competition among workers will bring down the wage rate to the subsistence level *OW* and *OL* labour is employed. Further decline in the wage rate below the subsistence level to *OW"* means increase in the consumption level of workers and *EU* unemployment exists.

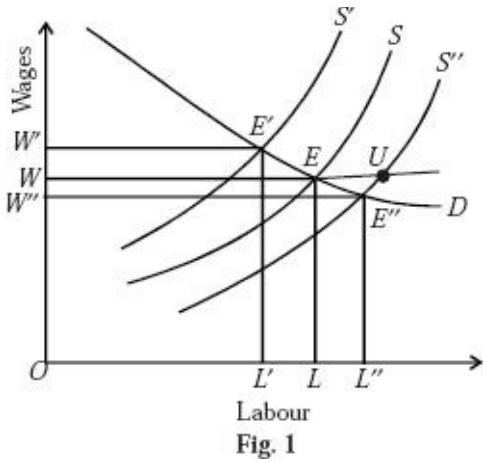

Fig. 1

This is based on Mill's notion that "demand for commodities is not demand for labour." It means that income *invested* as advances of wages to labour creates employment and not income *spent* on consumer goods. An increase in consumption will mean a decline in investment. So increase in investment leads to increase in the wage fund and to economic progress.

Rate of Capital Accumulation. According to Mill, the rate of capital accumulation depends upon:

(*i*) the amount of the fund from which savings can be made or the size of the net produce of industry, and

(*ii*) the strength of the disposition to save. Capital is the result of saving, and savings come from the abstinence from present consumption for the sake of future goods. Although capital is the result of saving, it is nevertheless consumed. This means that saving is spending. Since savings depend upon the size of the net produce of industry, they increase with increase in profit and rent which go to make the net produce. On the other hand, the strength of the disposition to save depends upon:

(*a*) the rate of profit, and

(*b*) the desire to save or what Mill called "the effective desire of

accumulation."

For Mill, profits depend on the cost of labour. So the rate of profit is the ratio of profit to wages. When profits rise or wages fall, the rate of profit increases which, in turn, raises the rate of capital accumulation. Similarly, it is the desire to save which tends to increase the rate of capital accumulation.

Rate of Profit. According to Mill, the ultimate tendency in an economy is for the rate of profit to decline due to diminishing returns in agriculture and increase in population at the Malthusian rate. In the absence of technical improvement in agriculture and the growth rate of population being higher than the rate of capital accumulation, the rate of profit is "within a hand's breadth of the minimum," and the country is "on the verge of the stationary state."

However, the tendency of profits to be minimum can be checked by a number of factors:(1) capital losses during a crisis; (2) technical improvement; (3) the expansion of foreign trade; (4) government borrowing for unproductive expenditure; and (5), by capital exports to colonies to produce consumer goods for the home country. But none of these factors can continue indefinitely. So ultimately profits would have the tendency to be at the minimum level and the rate of accumulation to decline.

The Stationary State. Mill thought that the stationary state was imminent—"at most a few years ahead and no more"—its arrival being postponed by the above factors. He welcomed its arrival because it would ultimately lead to improvement in income-distribution and a large remuneration for labour. But this could only be possible by control on the increase in numbers among the working classes through "provident habits" and education. Thus "in Mill's stationary state, there could be no increase in either population or stock of capital, profit having reached the minimum necessary to prevent net dissaving by the economy as a whole. However, there might still be a rising standard of living due to improvement in the art of living and increased leisure through technical progress."

Role of the State. Mill was in favour of the policy of laissez-faire which should be the general rule: "every departure from it, unless required by some great good, is a certain evil." He, therefore, assigned the minimum role to the

state in economic affairs. For instance, he thought it a necessary intervention by the state to reform the redistribution of the ownership of the means of production with such schemes as a ceiling on inheritance, peasant proprietorship, profit sharing, and co-operation. Even as the believer of laissez-faire, Mill favoured reforms in the institutional framework of the market. He wanted the state to pass laws against commercial frauds and enforce them strictly. He also recommended compulsory education and a system of examinations by the state because the uneducated cannot be a "competent judge of the commodity." And, "successful production depends more on the qualities of the human agents, than on the circumstances in which they work." Similarly, Mill declared himself in favour of the regulation of working hours on the ground that "public action is sometimes necessary to give effect to self-interests of individuals." Further, Mill was in favour of free trade and against protection and defended the imposition of protective duties temporarily in the case of infant industries.

A CRITICAL APPRAISAL

Of all the classical economists, Mill stands unique in that he built a theory in which he discussed almost all the factors which are essential for economic development in the present times. He stressed the importance of such factors as the rate of saving, the profit rate, the rate of capital accumulation, technical improvement, equitable distribution, expansion of foreign trade, institutional changes, etc.

But Mill "was not original as an economist," according to Prof. E. Roll. Prof. Stigler is more forthright when he says, "Mill was not trying to build a new system but only to add improvements here and there to the Ricardian system." He tried to improve upon Ricardo fundamentally in two respects, viz., the stationary state and the wages-fund doctrine. But these have also been subjected to criticisms along with his other notions.

1. Stationary State not a Reality. Ricardo believed that the stationary state would come about in the future when capital accumulation stopped. For Mill, the stationary state was very near. He welcomed its arrival because it would lead to improvement in the distribution of income. But Mill turned out to be a false prophet because the stationary state that he foresaw has not arrived, nor

does it show any signs of arrival.

2. Wrong Notion of Wages Fund. Unlike Ricardo, Mill believed that the wages fund depended upon the aggregate fund of capital and that wages were paid out of capital as advances. He, therefore, argued that trade unions could raise wages. Economists have vehemently criticised Mill's wages-fund theory. Cannon called it "the biggest blunder made in economic theory in modern times." Marshall called it the "vulgar form of the wages-fund theory" on which Mill "expresses his meaning badly." The reason being that he related the wages fund to capital rather than to the national dividend.

3. Malthusian Theory is Wrong. Mill was unduly pessimistic about the growth of population in terms of the Malthusian theory. The Malthusian theory has been proved wrong in the capitalist countries of the world.

4. Law of Diminishing Returns not Operative. Similarly, Mill's belief in the operation of the law of diminishing returns on land has also been proved wrong by the technological progress that has taken place in the advanced countries.

5. Laissez-faire not a Practical Policy. Mill favoured the policy of *laissez-faire* in economic affairs, but such a policy is impractical. In fact, no economy can function in which there is perfect competition, and no economy can grow without state help in one form or the other.

APPLICABILITY OF MILL'S THEORY ON UNDERDEVELOPED COUNTRIES

Mill's views about capital accumulation, diminishing returns, population growth and limited role of the state are applicable to underdeveloped countries.

According to Mill, the principle of accumulation is weak in UDCs. People neither save nor work in order to save except in response to enormously high profits. Productivity is low because capital is scarce. Drudgery is great due to lack of mechanical implements. Therefore, "it is necessary to wait a considerable time for profits to emerge." What is needed in these countries is "an increase of industry and of the effective desire for accumulation." For this, Mills suggested the following:

(1) a better government;

(2) moderate taxes;

(3) more complete security of property and freedom from arbitrary extraction under the names of taxes.

(4) a more permanent and more advantageous tenure of land securing to the cultivator as far as possible, the undivided benefits of the industry, skill and economy;

(5) improvement of public intelligence, the decay of usages or superstitions which interface with the effective employment of industry and the growth of mental activity, and making the people alive to new objects of desire;

(6) the introduction of foreign technology which would raise the marginal product of capital that is scarce because of the low profitability and saving;

(7) importance of foreign capital which would make the increase of production independent of the adequate domestic supply of capital, stimulate the growth of capital and by its example, break the chain of habits, stimulate new ideas, develop the sense of economic aspiration and foresight and generate new wants. Mill believed that foreign capital might not raise the levels of living at any rate in the short run, but it could at least be a powerful stimulus to economic development.

Mill believed in the Malthusian theory of population but with the difference that he favoured population control through birth control and not by moral restraint alone. The experience of underdeveloped countries proves that the Malthusian theory is applicable and that population can be controlled only by adopting birth control, as recommended by Mill.

Mill was a staunch free trader and believed in the policy of *laissez-faire*. Naturally, he assigned minimum role to the state. But whatever state intervention Mill wanted that is applicable in full to underdeveloped countries. He recommended reforms in the redistribution of the ownership of the means of production through such measures as ceiling on inheritance, peasant proprietorship, profit sharing and cooperation. These are very relevant in the

context of underdeveloped countries because there are inequalities of income and wealth. Similarly, Mill suggested reforms in the institutional framework of the market. Since underdeveloped countries are characterised by market imperfections, reforms in the institutional set-up are essential. Last but not the least, his emphasis on compulsory education and reduction of working hours of labourers is as true as it was when he wrote his *Principles* in 1848. As a matter of fact, no development is possible in underdeveloped countries without assigning some role to the state.

CHAPTER

The Classical Theory

THE THEORY

The classical theory, as stated by Smith, Malthus, Mill and Ricardo, can be explained as follows:

Laissez-Faire Policy. The classical economists believe in the existence of an automatic free market in a perfectly competitive economy which is free from any government interference. It is the "invisible hand" which maximises the national income.

Capital Accumulation, the Key to Progress. All classicists regard capital accumulation as the key to economic progress. They, therefore, lay emphasis on larger savings. Only capitalists and landlords are capable of saving, according to them. The working class is incapable of saving because it gets wages equal to the subsistence level. Out of total production after paying rent to landlords and subsistence wages to workers, the surplus goes to capitalists as profits.

Profits, the Incentive to Investment. According to the classicists, profits induce investment. The larger the profits, the greater the capital accumulation and investment.

Tendency of Profits to Decline. Profits do not increase continuously. They tend to decline when competition increases for larger capital accumulation among capitalists. The reason, according to Smith, is increase in wages due to competition among capitalists. Whereas, according to Ricardo, when wages and rent rise with the increase in the price of corn, profits decline.

Suppose an expected increase in profits brings about an increase in investment which adds to the existing stock of capital and to the steady flow of improved techniques. This increase in capital accumulation raises the wages fund. As a

result, wages rise. Higher wages induce an accelerated population growth which causes the demand for food to rise. Food production is raised by employing additional labour and capital. But diminishing returns to land bring about a rise in labour cost. Consequently, the price of corn goes up and in turn rents increase, wages rise, thereby reducing profits. Reduction in profits implies reduction in investment, retarded technological progress, diminution of wages fund and slowing down of population growth and capital accumulation. "In the classical model, the end result of capitalist development is stagnation. This stagnation results from the natural tendency of profits to fall and the consequent choking off of capital accumulation."[1] When this happens, capital accumulation ceases, population becomes constant and the stationary state sets in.

Stationary State. All classical economists visualize the stationary state as the end of the process of capital accumulation. When once profits start declining, this process continues till profits become zero, population and capital accumulation stop increasing and the wage rate reaches the subsistence level.

The stationary state is explained in Fig.1. Population is measured along the horizontal axis and the total product minus rent on the vertical axis. The curve *OP* is the production function which shows total production minus rent as the function of population. As population increases, the *OP* curve flattens out due to the operation of the law of diminishing returns. The ray through the origin *OW* measures the constant real wage rate. The vertical distance between the horizontal axis and the wage rate line *OW* measures the total wage bill at different levels of population. Thus W_1N_1, W_2N_2 and W_3N_3 are the total wage bills at ON_1, ON_2 and ON_3 levels of population. When the wage bill is W_1N_1, the profits are P_1W_1. (Total product minus rent ÷ the total wage bill, i.e., $P_1N_1 \div W_1N_1 = P_1W_1$.) When profits are P_1W_1, investment is encouraged. The demand for labour increases to ON_2, which pushes up the wage bill to W_2N_2 but profits decline to P_2W_2. This will encourage further investment and technical

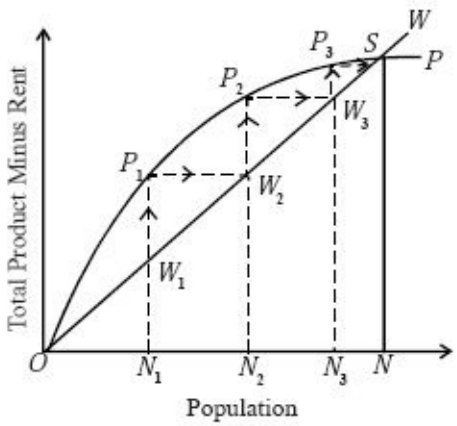

Fig. 1

progress and raise the demand for labour to ON_3 and the wage bill will also increase to W_3N_3. But the profits will decline to P_3W_3. This process of capital accumulation, increase in population and the wage bill will continue till profits disappear altogether at point S from where the stationary state sets in.

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1. B. Higgins,*op. cit.*, p. 87-88.

ITS CRITICISMS

This simple and abstract classical theory of development is not free from the following criticisms.

1. Ignores Middle Class. The whole classical analysis was based on the socio-economic environment prevailing in Great Britain and certain parts of Europe. It assumed the existence of a rigid division of society between capitalist (including landlords) and labourers. It neglected the role of the middle class which provided the necessary impetus to economic growth. It did not occur to them that the major source of savings in an advanced society was the income-receivers and not the property owners.

2. Neglects Public Sector. To the classicists, perfect competition and the institution of private property were the essential prerequisites for economic development. They, however, failed to realize the important role which the public sector has assumed in accelerating capital accumulation in recent years.

3. Less Importance to Technology. One of the important lacunae in the classical theory is the part played by science and technology in development. The classicists usually assumed technical knowledge to be given and unchanging overtime. But they failed to visualize the important impact that science and technology had on the rapid economic development of the now developed nations.

4. Unrealistic Laws. The pessimistic view of the classical economists like Ricardo and Malthus that “the end result of capitalist development is stagnation” was based on two assumptions: application of diminishing returns to land and the Malthusian Theory of Population. Rapid increase of farm produce in advanced nations has proved that the classicists under estimated the

potentialities of technological progress in counteracting diminishing returns to land. Similarly, the Malthusian theory of population has been disproved by population trends prevailing in the Western world. Diametrically opposed to the Malthusian principle, population has not grown so fast as to outstrip the food supply. On the other hand, agricultural productivity has been much faster than the population growth.

5. Wrong Notions about Wages and Profits. Wages have not tended to be at the subsistence level. There has been a continuous increase in money wages without a corresponding decline in profit rates. And the mature economies have not reached the stage of economic stagnation. Both Ricardo and Malthus have been scoffed at as false prophets in the light of the economic development of the Western world.

6. Unrealistic Growth Process. The classical theory assumed a stationary state in which there was change, but around a point of equilibrium; there was progress, but steady and continuous like a tree. This is, however, not a satisfactory explanation of the process of economic growth. For economic growth, as it is understood today, does not proceed steadily and continuously, but by "fits and starts."*

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* For its applicability to underdeveloped countries refer to Smithian and Ricardian theories alongwith those of Malthus and Mill under this head.

CHAPTER

The Marxian Theory

INTRODUCTION

Karl Marx, the celebrated author of 'Das Kapital', is one of the few celebrities in history who cast a spell on hundreds of millions of people by his doctrines. He has been epitomized as 'Marx the Prophet' and is ranked with Christ and Mohammad if we are to judge him by the number of his followers. As Schumpeter wrote, "Marxism is a religion. To the orthodox Marxist, as any believer in a Faith, the opponent is not merely in error but in sin."[1] Marx predicted the inevitable doom of capitalism and it was on this prediction that communism has built its edifice. The Marxian analysis is the gravest and the most penetrating examination of the process of capitalist development. It had the greatest influence in shaping policies in the Soviet Union, China, and other communist countries. Our purpose here is to examine the Marxian process of economic development and not the Marxist system as whole.

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1. J.A. Schumpeter, Ten Great Economists, p. 5 and footnote.

THE MARXIAN THEORY

"Marx contributed to the theory of economic development in three respects, namely, in broad respect of providing an economic interpretation of history, in the narrower respect of specifying the motivating forces of capitalist development, and in the final respect of suggesting an alternative path of planned economic development."

Materialistic Interpretation of History. The materialistic interpretation of history attempts to show that all historical events are the result of a continuous economic struggle between different classes and groups in society. The main cause of this struggle is the conflict between 'the mode of production' and 'the

relations of production.' The mode of production refers to a particular arrangement of production in a society that determines the entire social, political and religious way of living. *The relations* of *production* relate to the class structure of a society "uniquely characterised" by the following components: (*i*) the organisation of labour in a scheme of division and co-operation, the skills of labour and the status of lahour in the social context with respect to degrees of freedom or servitude; *(ii)* the geographical environment and the knowledge of the use of resources and materials; and (iii) technical means and processes and state of science generally.[2] Keeping these in view, Marx explains his process of economic development.

THE MARXIAN PROCESS OF ECONOMIC DEVELOPMENT

According to Marx, every society's class structure consists of the *propertied* and the *non-propertied* classes. Since the mode of production is subject to change, a stage comes in the evolution of a society when the forces of production come into clash with the society's class structure. The existing property relations "turn into fetters" on the forces of production. Then comes the period of 'social revolution.' This leads to the class struggle—the struggle between the have and the have-nots—which ultimately overthrows the whole social system.

Surplus Value. Marx uses his theory of surplus value as the economic basis of the 'class struggle' under capitalism and it is, on the basis of his theory of surplus value that he builds the super structure of his analysis of economic development. Class struggle is simply the outcome of accumulation of surplus value in the hands of a few capitalists. Capitalism, according to Marx, is divided into two great protagonists: the workers who sell their 'labour-power' and the capitalists who own 'the means of production.' Labour power is like any other commodity.

The capilist gives raw materials, machines etc. to labourers. When manufactured goods are sold, the capitalist finds that the amount of money he receives is more than the amount spent on the production of commodities. This can be expresed in this way. A capitalist comes to the market with some amount of money *M* and buys factors of production like raw materials, machines, labour power, etc. With these, he manufactures commodity *C* which he sells at

more money *M'*. In this way, the equation bcomes : $M \rightarrow C \rightarrow M'$, where $M' > M$. Thus the difference between *M'* and *M* is the surplus value. According to Marx, the cause of this surplus value is not raw materials, machines, etc. because their contribution to production is not more than their contribution to production is not more than their value. Therefore, the surplus value arises only from labour power.

The labourer sells his labour for what it is worth in the labour market, *viz.*, for its value. And its value, like the value of any other commodity, is the amount of labour that it takes to produce labour-power. In other words, the value of labour-power is the value of the means of subsistence necessary for the maintenance of the labourer, which is determined by, the number of hours necessary for its production. According to Marx, the value of the commodities necessary for the subsistence of the labour is never equal to the value of the produce of that labour. If a labourer works for a ten-hour day, but it takes him six hours' labour to produce goods to cover his subsistence, he will be paid wages equal to six hours' labour. The difference worth 4 hours' labour goes into the capitalist's pocket in the form of net profits, rent and interest. Marx calls this unpaid work "surplus value." The extra labour that a labourer puts in and for which he receives nothing, Marx calls "surplus labour."

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2. M.M. Bober, *Karl Marx's Interpretation of History*, p. 24.

Capital Accumulation. According to Marx, it is surplus labour that leads to capital accumulation. This supererogatory labour simply augments the capitalist's profits. The capitalist's main motive is to increase the surplus value which goes to swell his profits. He tries to maximize his profits in three ways: (1) by prolonging the working day in order to increase the working hours of surplus labour. If the working hours are extended from ten to twelve the surplus will automatically increase from four to six; (2) by diminishing the number of hours required to produce the labourer's sustenance. If they were reduced from six to four, the surplus would again rise from four to six. It also tantamounts to a reduction in the subsistence wage; (3) by 'the speeding up of labour', *i.e.*, increasing the productivity of labour. This requires it technological change that helps in raising the total output and lowering the cost of production. According to Marx, women and children are also employed on machines that leads to increase in the surplus value.

Of the three methods, according to Marx, increase in the productivity of labour is the likely choice of the capitalists, since the other two methods of extending the working hours and reduction of wages have limitations of their own. So in order to make improvements in the productivity of labour, the capitalists save the surplus value, reinvest it in acquiring a large stock of capital and thus accumulate capital. "Accumulate, accumulate! That is Moses and the Prophets," and "Save, *i.e.*, reconvert the greatest possible portion of surplus value or surplus product into capital." These are the capitalist's methods.

Profits are determined by the amount of capital. As Marx says, "Capital is dead labour that vampire like only lives by sucking living labour and lives the more, the more labour it sucks." To explain the origin of profit and to analyse the relation between wages and profits, Marx separates capital into constant capital and variable capital. Capital invested in stocks or raw materials or equipment which directly assists the productivity of labour, Marx calls *constant capital (c).* Capital devoted to the purchase of labour power in the form of wages or direct subsistence, he terms *variable capital (v).* The surplus value is denoted by (*s*). So the total value of product *(w)* = constant capital *(c)* + variable capital *(v)* + surplus value (*s*) or (c + *v)* + *s*.

It is on the basis of this division of the total output that Marx introduces his *Departmental Schema of Simple and Expanded Reproduction.*

Marx divides the total output of the economy *(w)* into Department 1 and Department 2. The former is related to the production of capital goods and the latter to consumer goods. The total output of each Department is shown as

$$\begin{aligned} w_1 &= c_1 + v_1 + s_1 \\ + w_2 &= c_2 + v_2 + s_2 \\ w &= c + v + s \end{aligned}$$

The Simple Reproduction Scheme indicates a situation of stationary state in which all that is produced is consumed. Thus net investment is zero and there is no accumulation or surplus. Therefore, equality prevails in both the Departments. Hence the value of total constant capital in both the Departments ($c_1 + c_2$) must equal the output of Department 1 ($c_1 + v_1 + s_1$), that is

$$c_1 + c_2 = c_1 + v_1 + s_1$$

or

$$c_2 = v_1 + s_1$$

Similarly, the total consumption in both the Departments ($v_1 + s_1 + v_2 + s_2$) must equal the total output of Department 2 ($c_2 + v_2 + s_2$), that is

$$c_2 + v_2 + s_2 = v_1 + s_1 + v_2 + s_2$$

or

$$c_2 = v_1 + s_1$$

(By eliminating the common factor ($v_2 + s_2$)

This shows that the value of constant capital in Department 2 must equal the value of commodities consumed by workers (v_1) and capitalists (s_1) in Department 1.

It is in Marx's *Expanded Reproduction Scheme* that accumulation takes place because the production of Department 1 (capitalist sector) is greater than the demand for constant capital in both the Departments, that is

$$c_1 + v_1 + s_1 > c_1 + c_2$$

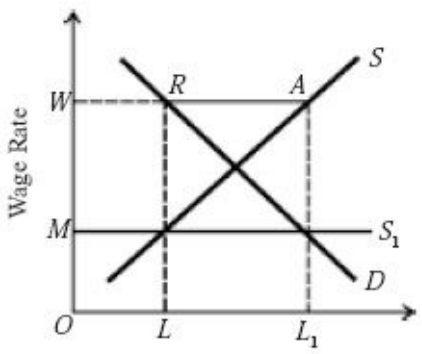
or

$$v_1 + s_1 > c_2$$

This shows that accumulation is taking place which is being invested in employing more labour (v_1) and the means of production (c_1) in Department 1 than in Department 2. These, in turn, increase the surplus value (s_1).

In order to analyse the nature of capitalist accumulation, Marx establishes certain relationships between *c, v,* and *s*. The ratio of constant to variable capital (*c/v*) , is termed as the *organic composition of capital*. The rate of surplus value is defined as *s/v,* the ratio of surplus value to variable capital or of profits to wages. This is known as the **degree or rate of exploitation**. This leads Marx to point out that the rate of profit is not dependent solely on the rate of surplus value. The rate of profit *(r)* can change even though the rate of surplus value *(s/v)* remains constant, if a change occurs in the organic composition of capital (*c/v*). The influence of technical progress is to alter the organic composition of capital, generally in the direction of raising the ratio of constant to variable capital. Hence the tendency of industrial progress is to lower the rate of profit *r*, even though there is no decrease in the rate of surplus value.[3]

One of the consequences of capital accumulation is the *concentration* of capital in gigantic enterprises. Competition among capitalists forces them to cheapen their products. This can be done by introducing labour-saving machines which increase labour productivity. Those capitalists who are unable to replace labour by machines are 'squeezed out' and their enterprises are taken over by big capitalists.



चित्र 1

Capital accumulation and concentration involve increase in constant capital and decline in variable capital. The rapid growth of constant capital as compared with variable capital leads to a relative decrease in the demand for labour. This process of supplanting labour by machines creates an *industrial reserve army* which increases as capitalism develops. The larger the industrial reserve army, the worse are the conditions of the employed workers, since the capitalist can dismiss dissatisfied and troublesome workers, being able to replace them from the ranks of the reserve army. Capitalists are also able to cut down wages to a semi-starvation level and appropriate more and more surplus value. This is the *law of the increasing misery of the masses* under capitalism. This is shown in Fig. 1 where the labour force is taken on the horizontal axis and the wage rate on the vertical axis. *D* is the demand curve for labour and *S* is the supply curve of labour. At the wage rate *W* , there is an increase in the industrial reserve army equal to *RA* (=LL_1) because the supply of labour is more than the demand for labour. As the industrial reserve army expands, capitalists start adopting labour-saving machines and reduce the wage rate to the minimum subsistence level *OM* in order to have more surplus value.

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3. Maurice Dobb, *Political Economy and Capitalism*, pp. 96-97.

DOWNFALL OF CAPITALISM

But when the capitalist is replacing the workers by machines, he is killing the goose that laid the golden eggs. There is a continual reduction of the surplus value. Marx believes that technological progress tends to increase the organic composition of capital (*c/v*). Since the rate of profit is inversely related to the

organic composition of capital, the former tends to decline with accumulation. Marx explained this tendency of falling rate of profit in terms of the following equation:

The rate profit (*r*) varies inversely with the organic composition of capital (*c/v*) and directly with the rate of surplus value (rate of exploitation (*s/v*). Therefore, the rate of profit *r* rises with the rate of surplus value *s/v* and falls with the organic composition of capital *c/v.*

Marx's law of falling rate of profit is explained in Fig. 2. Marx moves on the presumption that as the capitalists use more machines (constant capital), they keep the supply of labour constant. In the Figure the amount of capital is taken on the horizontal axis and total output on the vertical axis. The total output curve *OP* that slopes upto point *A*, total output increases at an increasing rate and after that at a diminishing rate. It means that as more machines are installed while keeping the supply of labour constant, the law of diminishing returns operates. Total wage bill is constant at *OT* and the horizontal line *TW* shows constant supply of labour as the amount of capital increases. A tangent TT_1 touches the total output curve *OP* at point A and a perpendicular AK_1 from *A* cuts the *TW* line at S_1. Similarly an other line TT_2 from *T* cuts the *OP* curve from below at *B* and a perpendicular BK_2 from it cuts the line *TW* at S_2 .

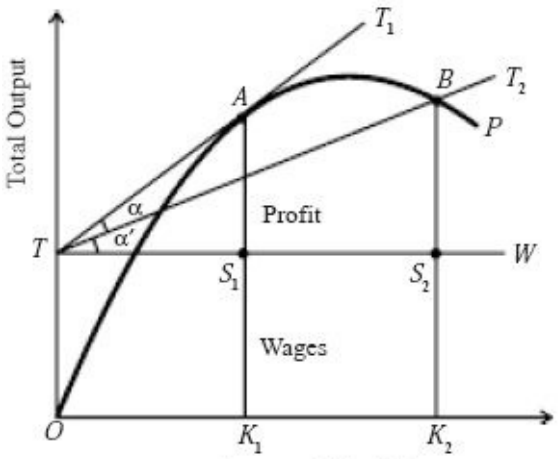

Fig. 2

With OK_1 capital on machines, total output is AK_1 , total profit to capitalists is AS_1 and total wages are S_1K_1. The rate of profit is $\alpha = AS_1/TS_1$. If to increase the rate of profit, capitalists use more capital than OK_1, the rate of profit declines. When OK_2 capital is used, the rate of profit is $\alpha' = BS_2/TS_2$ which is less than AS_1/TS_1. Thus when more capital is used on machines, the rate of profit actually declines.

Capitalist Crisis. In order to counteract this tendency of declining rate of profit, the capitalists increase the degree of exploitation by reducing wages, lengthening the working day and by "speed ups," etc. But since every capitalist is engaged in introducing new labour-saving and cost-reducing devices, the ratio of labour (and hence surplus value) to total output falls still further. The rate of profit declines all the more. Production is no longer profitable. Consumption dwindles as machines displace men and the industrial reserve army expands. Bankruptcies ensue. Every capitalist tries to dump goods in the market and in the process small firms disappear. A capitalist crisis has begun. The ultimate cause of all economic crisis, Marx points out is the poverty and limited purchasing power of the masses. Economic crisis appears in the form of an over production of commodities, acute difficulties in finding markets, a fall in prices and a sharp curtailment of production. During the crisis, unemployment increases sharply, the wages of workers are further cut, credit facilities breakdown and small employers are ruined.

This does not continue for ever. Revival soon starts. The low level of prices, cut in wages, elimination of speculative ventures and destruction of capital tend to raise the profit rate which eventually leads to new investments. As Marx wrote, "A crisis always forms the starting point of large new investments. Therefore, from the point of view of society as a whole a crisis is, more or less, a new material basis for the next turnover cycle. But it leads to the same catastrophic conclusion: competition for labour; higher wages labour-saving machinery; a reduction in surplus value; decline in profit rate; still greater competition and collapse. This succession from crisis to depression, followed by recovery and boom and then again crisis is evidence of the *cycle* character of the development of capitalist production.

In each period of crisis stronger capitalists expropriate the weaker capitalists and along with it grows the indignation of the working class, which is always increasing in numbers and is disciplined, united and organised by the very mechanism of the process of capitalist production itself. This leads to the struggle between the working class and the capitalists. This is the historical tendency of capitalist development. In elaborating the general law of capitalist development, Marx provides the economic explanation of the necessity and inevitability of the revolutionary transformation from capitalist to socialist society. Capitalism leads to the proletarian revolution whereby the

"dictatorship of the proletariat" is established. Poverty will disappear. The state will "wither away" and each individual will contribute to national income according to his abilities and receive according to his needs. Capitalism falls and socialism replaces capitalism.

A CRITICAL APPRAISAL

Marx's theory of capitalist development has been accepted by his followers as a gospel truth while it has been severely criticised by his opponents for the following reasons:

l. Surplus Value Unrealistic. The whole Marxian analysis is built on the theory of surplus value. In the real world, we are concerned not with *values* but with real tangible prices. Thus Marx has created an abstract and unreal *value world* which has made it difficult and cumbersome to understand the working of capitalism.

2. Marx-A False Prophet. Marx has proved to be a false prophet. No doubt socialist societies have come into existence but their evolution has not been on the lines laid down by Marx. The countries which have toed the Marxian line of thinking have been curiously those in which capitalist development lagged behind. All the communist states had been poor and are even now so, as compared to the capitalist countries. There is no increasing misery of labour in advanced capitalist societies as asserted by Marx. On the contrary, real wages of workers have continued to rise. The workers have tended to become more prosperous with capitalist development. And the middle class instead of disappearing has emerged as a dominant class. There have been also no signs of the 'withering away' of the State in these countries

3. Technological Progress Helpful in Increasing Employment. Marx pointed out that with increasing technological progress, the industrial reserve army expands. But this is an exaggerated view because the long run effect of technological progress is to create more employment opportunities by raising aggregate demand and income.

4. Falling Tendency of Profits not Correct. According to Joan Robinson, Marx's "explanation of the falling tendency of profits explains nothing at all." Marx contends that as development proceeds, there is an increase in the

organic composition of capital which brings about a decline in the profit pate. But Marx failed to visualize that technological innovations can be capital saving too, and that with a fall in capital-output ratios and increases in productivity and total output, profits can rise along with wages.

5. Marx could not Understand Flexibility in Capitalism. Marx also could not foresee the emergence of political democracy as the protector and the preserver of capitalism. Democracy as a political system has proved its resilience and adaptability to the changing times. The introduction of social security measures, anti-trust laws and the mixed economies have given a lie to the Marxian prediction that capitalism contains within itself the seeds of its own destruction.

6. Cyclical Theory Wrong. Marx emphasized that capital accumulation led to a reduction in the demand for consumption goods and fall in profits. But he failed to realise that with economic development the share of wages in aggregate income need not fall, nor the demand for consumer goods.

7. Static Analysis. Marx's theory, though it sought to explain a dynamic process, was in the words of Schumpeter, "unsuited for it, its two main props being (*a*) labour theory of value, and (*b*) a modified version of subsistence theory of wages. Marx was analysing the problem of growth with the help of tools which were essentially suited to static economic analysis."

Conclusion. Despite these weaknesses, some of the. Marxian tools pertaining to his theory of economic development have ever since become part and parcel of the theory of economic growth. Technological progress and innovations are the main stay of any theory of economic development. Similarly, capital accumulation is the fundamental ideal behind economic growth. Profits are still regarded as both the hallmark of capitalist development and its Achilles' heel. Marx showed that economic development does not follow a smooth course but comes about in "fits and starts." Business cycles are inevitable. He pointed out that a state of under-consumption was the main cause of depression and that for stable growth a proper balance between investment and consumption was essential. He also indicated that too low or too high wages in relation to total output can adversity affect investment and thus stifle economic growth. Industrial unemployment is also one of the major variables in his system. Thus, Marx was in a way Keynes' precursor.

THE MARXIAN THEORY AND UNDERDEVELOPED COUNTRIES

The, Marxian theory is not applicable directly to underdeveloped countries. Marx did not think of the problems of such countries. “Apart from a few illusions remarkable for their determinant note with regard to obtaining prospects for economic development in regions like Western Asia or India no special attention is given to the problems of change in underdeveloped countries”. [4] Marx was mainly concerned with problems connected with the development of capitalism in the Western world. Colonies were regarded as one of the “highest stages” in capitalist development. Foreign domination was regarded as the principal cause of economic backwardness of the colonies. The only obvious remedy was their political freedom.

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4. A. Bonne, *op. cit* ., p. 243.

Marx’s failure to recognize the existence of population pressures makes his theory inapplicable to overpopulated underdeveloped countries. But some of the variables of his analysis do exist in such economies. In underdeveloped countries till recently under the colonial rule, labour was being exploited for the benefit of the ‘home country.’ There was the concentration of capital in the hands of a few capitalists. Even now in almost all the underdeveloped countries that are also politically free, wages are near subsistence levels; the ‘increasing misery’ of the masses is visible : a ‘reserve army’ of the chronic and disguised unemployed exists; the problem of under-consumption is universal and the society is sharply divided between the ‘two classes,’ the middle class being virtually non-existent. [5] The existence of such conditions can lead to ‘class struggle’ and the establishment of the ‘dictatorship of the proletariat.’ The recent political turmoils in some of the Latin American, African, the Middle and the Far Eastern countries have shown that the existence of Marxian conditions in backward countries act like nurseries where the communist seed grows soon. “Ironically, however, it is Marx’s perception of planned development expressed in his minor writings which presumably has had a greater impact on the actual economic development of countries such as Soviet Russia and mainland China. Marx’s notion of planned development also seems to appeal to those backward countries which are in a great hurry to

industrialize at the risk of excessive national “belt-tightening.”

As a matter of fact, it is Marx’s Departmental Schema that is applicable to underdeveloped countries. Such a country is primarily a dualistic economy consisting of a capitalist sector and a subsistence agriculture and small scale sector which may be said to represent Marx’s two Departments. It is the capitalist sector which yields large economic surplus, while the subsistence sector yields a small surplus. Rapid economic development is possible by reorganising and expanding the capitalist sector (Department 1) and transforming the subsistence sector (Department 2) into the former so as to increase the economic surplus. This necessitates planning for industrialisation and increase in the supply of agricultural commodities to meet the expanding demand of the capitalist sector. As pointed out by Oscar Lange, it is the commodity character of agricultural production which determines the course and rate of industrialisation alongwith the increased production of capital goods. [6]

A number of underdeveloped countries like India, Burma and Ghana have followed the Marxian Departmental Schema in their development plans. [7] These plans have emphasised the growth of Department 1 in relation to Department 2. The basic strategy has been to increase investments in capital goods industries and services, and to increase the supply of consumer goods by increasing investment and production in agriculture and small scale sector. The primary aim has been to create larger employment opportunities, to increase purchasing power and fresh demand, to build a strong capital base and increase productive and technical capacities within the economy.

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5. Only the Marxian terminology is applicable. For under-consumption implies an abundance of unmarketable goods due to over-production in the Marxian analysis while in the case of underdeveloped countries it refers to low level of consumption due to low level of production. Similarly, the existence of a surplus reserve army of workers in the Marxian theory is the result of the introduction of labour-saving devices, whereas in underdevloped countries unemployment is disguised and rural, not industrial, the result of the growth in numbers rather than the use of industrial technology.

6. O. Lange (ed.), *Problems of Political Economy of Socialism*, 1962.

7. Only the Mahalanobis Model for the Second Indian Five-Year Plan was based on the Marxian Departmental Schema.

CHAPTER

The Schumpeterian Theory

INTRODUCTION

Joseph Alois Schumpeter first presented his theory of economic growth in*Theory of Economic Development* publishedin German in 1911 (its English edition appeared in 1934) which was elaborated and refined but in no way altered in any essential respect in his *Business Cycles* (1939) and *Capitalism, Socialism and Democracy* (1942).

THE THEORY

To start with, Schumpeter assumes a perfectly competitive economy which is in stationary equilibrium. In such a stationary state, there is perfect competitive equilibrium: no profits, no interest rates, no savings, no investments and no involuntary unemployment. This equilibrium is characterised by what Schumpeter terms the "circular flow" which continues to repeat itself in the same manner year after year, similar to the circulation of the blood in an animal organism. In the circular flow, the same products are produced every year in the same manner. "For every supply there awaits somewhere in the economic system a corresponding demand. For every demand the corresponding supply." In other words, all economic activities are repetitive in a timeless economy. To Schumpeter, "The circular flow is a stream that is fed from the continually flowing springs of labour-power and land, and flows in every economic period into the reservoir which we call income, in order to be transformed into the satisfaction of wants." Development, according to him, "is spontaneous and discontinuous change in the channels of the *circular* flow, disturbance of equilibrium, which for ever alters and displaces the equilibrium state previously existing."[1] These 'spontaneous and discontinuous' changes in economic life are not forced upon it from without but arise by its own initiative from within the economy and appear in the sphere of industrial and commercial life. Development consists in the carrying out of new

combinations for which possibilities exist in the stationary state. New combinations come about in the form of innovations.

Innovations. An innovation may consist of: (1) the introduction of a new product; (2) the introduction of a new method of production; (3) the opening up of a new market; (4) the conquest of a new source of supply of raw materials or semi-manufactured goods; and (5) the carrying out of the new organisation of any industry like the creation of a monopoly. According to Schumpeter, it is the introduction of a new product and the continual improvements in the existing ones that lead to development.

Role of Innovator. Schumpeter assigns the role of an innovator not to the capitalist but to the entrepreneur. The entrepreneur is not a man of ordinary managerial ability, but one who introduces something entirely new. He does not provide funds but directs their use. The entrepreneur is motivated by: *(a)* the desire to found a private commercial kingdom, *(b)* the will to conquer and prove his superiority, and *(c)* the joy of creating, of getting things done, or simply of exercising one's energy and ingenuity. His nature and activities depend on his social-cultural environment. To perform his economic function, the entrepreneur requires two things: first, the existence of technical knowledge in order to produce new products; second, the power of disposal over the factors of production in the form of credit. According to Schumpeter, a reservoir of untapped technical knowledge exists which he can make use of. Therefore, credit is essential for development to start.

Role of Profits. An entrepreneur innovates to earn profits. Profits are conceived "as a surplus over costs: a difference between the total receipts and outlay–as a function of innovation." According to Schumpeter, under competitive equilibrium the price of each product just equals its cost of production, and there are no profits. Profits arise due to dynamic changes resulting from an innovation. They continue to exist till the innovation becomes general.

Breaking the Circular Flow. Schumpeter's model starts with the breaking up of the circular flow with an innovation in the form of a new product by an entrepreneur for the purpose of earning profits. In order to break the circular flow, the innovating entrepreneurs are financed by bank-credit expansion. Since investment in innovations is risky, they must pay interest on it. Once the

new innovation becomes successful and profitable, other entrepreneurs follow it in "swarm-like clusters." Innovations in one field may induce other innovations in related fields. The emergence of a motor car industry may, in turn, stimulate a wave of new investments in the construction of highways, rubber tyres and petroleum products, etc. But the spread of an innovation is never 100 percent.

The spread of innovation is shown in Fig. 1 where the percentage of firms adopting a particular innovation is shown on the vertical axis and time taken on the horizontal axis. The curve *OI* shows that firms adopt an innovation slowly to start with but soon the adoption of innovation gains momentum. But it never reaches 100 per cent adoption by firms.

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1. A. Schumpeter, *Theory of Economic Development*, p. 64. Italics mine.

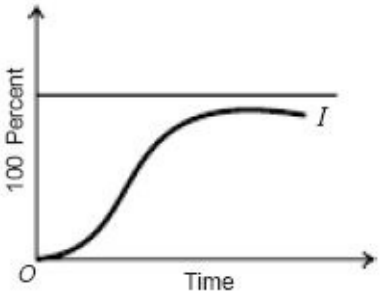

Fig. 1

Cyclical Process. Since investment is assumed to be financed by creation of bank credit, it increases money incomes and prices and helps to create a cumulative expansion throughout the economy. With the increase in the purchasing power of the consumers, the demand for the products of the old industries increases in relation to supply. Prices rise, profits increase and old industries expand by borrowing from the banks. It induces a secondary wave of credit inflation which is superimposed on the primary wave of innovation. Over-optimism and speculation add further to the boom. After a period of gestation the new products start appearing in the market displacing the old products and enforcing a process of liquidation, re-adjustment and absorption.[2] The demand for the old products is decreased. Their prices fall. The old firms contract output and some are even forced to run into liquidation. As the innovators start repaying bank loans out of profits, the quantity of money is decreased and prices tend to fall. Profits decline. Uncertainty and risks increase, the impulse for innovation is reduced and eventually comes to an end. Depression ensues.

Schumpeter believes in the existence of the Kondratieff long-wave of upswings and downswings in economic activity. Each long-wave upswing is brought about by an innovation in the form of a new product which leads to further

innovations in the methods of production, new forms of business organisation, new sources of supply of raw materials and intermediate products, and new markets. Thus there is abundance to goods available for the masses." In the words of Schumpeter, "mass production means production for the masses." Once the upswings ends, the long-wave downswing begins and the painful process of readjustment to the "point of previous neighbourhood of equilibrium" starts. Ultimately the natural forces of recovery bring about a revival. Once again equilibrium is restored. Then smite enterprising entrepreneurs begin with a new set of innovations, others follow, and a new boom begins. Schumpeter describes this process of 'capitalist development as one of "creative destruction" wherein the old economic structures of society are being continually destroyed and the new structures are being continually created in their place.

This is shown in Fig. 2 where time is taken on the horizontal axis and national output on the vertical axis. The curve *YPT* shows the long-run cyclical upswings and downswings. When there is a new innovation, the economy moves upwards from *Y* and production increases upto *P*. When this innovation ends and a new innovation starts and replaces the earlier one the, output level falls from *P* to *T*. In this way, "the creative destruction" process leads to the new equilibrium *T* of the economy that is higher than the earlier point *Y* which shows the development of the economy.

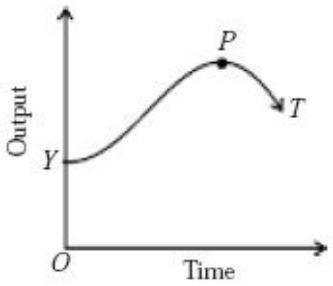

Fig. 2

Schumpeter's cyclical process of economic development is illustrated in Fig. 3 where the secondary wave is superimposed on the primary wave of innovation. With over-optimism and speculation, development proceeds more rapidly in the prosperity phase. When recession starts, the cycle continues downward below the equilibrium level to the depression phase. Ultimately, another innovation brings about revival.

In fine, entrepreneurs are the key figures in the Schumpeterian analysis. They bring about economic development in spontaneous and discontinuous manner. And "cyclical swings are the cost of economic development under capitalism," a permanent feature of its dynamic time-path.

Secularly, continued technological progress will result in an unbounded

increase in total and per capita output, since historically there are no diminishing returns to technological progress. As long as technological progress takes place, the rate of the profit will be positive. Hence there can be no drying up of sources of investible funds nor any vanishing of investment opportunities. "There is therefore no a *priori* ceiling to the level of per capita income in a capitalist society. Nonetheless, the economic success of capitalism will eventually lead to its decay. For the very process of capitalist development weakens the institutions and values basic to its own survival."[2] "Can capitalism survive? No, I do not think it can," wrote Schumpeter, as his final appraisal of the future of capitalism. To him, the very success of capitalism "undermines the social institutions which protect it, and "inevitably" creates conditions in which it will not be able to live and which strongly point to socialism as the heir apparent."[3]

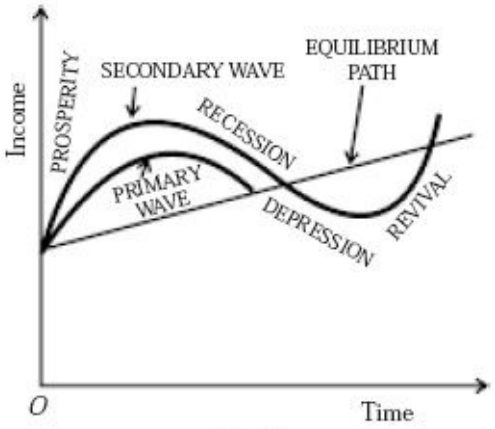

Fig. 3

Process of End of Capitalism. According to Schumpeter, capitalism can maintain itself only so long as entrepreneurs behave like knights and pioneers. But such daring innovators are being destroyed by the capitalist system itself which rests on a rational attitude. This enquiring, sceptical and rational attitude permeates the entire capitalist society. As a result, *three* forces are discernible that are the beginning of the creeping death of capitalism. They are: (1) the decadence of the entrepreneurial function; (2) the disintegration of the bourgeois family; and (3) the destruction of the institutional framework of the capitalist society.

In the early stages of capitalism, the driving force came from entrepreneurs who dared to innovate, to experiment, and to expand. But now innovation is reduced to a routine. Technological progress has become the business of teams of trained specialists. The new 'lords' of business are the managers, depersonalized owners and private bureaucrats. This reduces the industrial bourgeoisie to a class of wage-earners and thus undermines the function and the position of the entrepreneur as the "warrior knight."

There is also the destruction of the bourgeoisie family. Parents adopt a

rationalistic attitude in their behaviour towards children. The traditional family idea is weakened. The desire to found a “private kingdom” , a “dynasty” is no longer there. The will to accumulate wealth gradually disappears and along with it another important aspect of the capitalist society.

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2. I. Adelman, *Theories of Economic Growth and Development*, p. 108.

3. J.A. Schumpeter, *Capitalism, Socialism, and Democracy*, p. 61.

Finally, Schumpeter contends that the entrepreneur also tends to destroy the institutional framework of the capitalist society. The tendency towards concentration into big concerns weakens and destroys the twin institutions of private property and freedom of contract. In the case of big concerns, the proprietors are the small and large shareholders who are “dematerialized” and “defunctionalized” by the professional, salaried managers. The proprietors’ role is performed by the latter while the former are totally divorced from active management. According to Schumpeter, it was rationality that had destroyed the royal power in the past. Now again, it is the rationalistic attitude of the ruling group towards domestic and international problems that will be the bane of capitalism. But all these forces are not enough to ring the death knell of capitalism. It is, however, the active hostility of the intellectuals which is bringing the day nearer. The intellectuals sow seeds of doubt and discontentment in the minds of the masses against the social and political framework of the capitalist order. By inciting the white-collar groups and the labouring classes they are able to secure anti-capitalist political reforms. As a result, the institutional framework upon which capitalism rests starts crumbling and there is a gradual movement towards socialism. Eventually capitalism would fade away without any bang or whimper.

CRITICISMS OF THE THEORY

“Schumpeter’s theory must be ranked as a major performance, one worthy of such great economists as Smith, Mill, Marx, Marshal and Keynes.”[4] No doubt it is replete with brilliant reasoning and insight of a great theorist, yet it is not free from criticisms.

1. The entire process of Schumpeter’s theory is based on the innovator

whom he regards as an ideal person. Such persons were to be found in the 18th and 19th centuries. At that time innovations were made by entrepreneurs or inventors. But now all innovations form part of the functions of a joint stock company. Innovations are regarded as the routine of industrial concerns and do not require an innovator as such.

2. Economic development is not the result of the cyclical process. The downswings and the upswings are not essential for economic development. As Nurkse pointed out, economic development is related to continuous changes.

3. Schumpeter's contention that cyclical changes are due to innovations is also not correct. As a matter fact, cyclical fluctuations may be due to psychological, natural, and financial causes.

4. Schumpeter regards innovations as the main cause of economic development. But this is far from reality because economic development not only depends an innovations but also on many economic and social changes.

5. Schumpeter gives too much importance to bank-credit in his theory. Bank credit may be important in the short run when industrial concerns get credit facilities from the banks. But in the long run when the need for capital funds is much greater, bank credit is insufficient. For this, business houses have to float fresh shares and debentures in the capital market.

6. Schumpeter's analysis of the process of transition from capitalism to socialism is not correct. He does not analyse how a capitalist society is transformed into socialism. He simply tells that the institutional framework of a capitalist society is transformed with changes in the functions of the entrepreneur. His analysis of the end of capitalism is emotional rather than real.

To conclude with Meier and Baldwin, "Schumpeter's broad socio-economic analysis of capitalist process is generally admired. Yet few seem prepared to accept its conclusions. His arguments are stimulating but not completely convincing.... Although Schumpeter's analysis is provocative, it seems one-sided and over-emphasized."[5]

4. G.M. Meier and E. Baldwin, *op.cit.*, p. 95.

SCHUMPETER'S ANALYSIS AND UNDERDEVELOPED COUNTRIES

The applicability of Schumpeter's theory to underdeveloped countries is limited for the following reasons:

1. Different Socio-Economic Order. Schumpeter's theory corresponds to a particular socio-economic order that existed in Western Europe and America of the 18th and 19th centuries. In that period, some of the prerequisites of growth already existed. In underdeveloped countries, the socio-economic conditions are altogether different and the prerequisites for development in the form of economic and social overheads are non-existent.

2. Lack of Entrepreneurship. The Schumpeterian analysis depends upon the existence of an entrepreneurial class. However, in underdeveloped countries adequate entrepreneurship is lacking. In such economies, there are low profit expectations and low state of technologies which do not encourage innovational investments in new plant and equipment. Moreover, the lack of adequate power, transport, skilled personnel, etc. act as disincentives to entrepreneurial activity.

3. Not Applicable to Socialist Countries. Schumpeter's analysis is not applicable to the majority of underdeveloped countries which have socialist leanings. For example, the introduction of social security measures and high progressive income taxes are inimical to the development of an entrepreneurial class because they tend to reduce profits.

4. Not Applicable to Mixed Economies. Moreover, Schumpeter's innovator is a private entrepreneur who does not fit in the present day mixed economies. In an underdeveloped country, government is the biggest entrepreneur. The main impetus for development comes from the public and the semi-public sectors. Thus, Schumpeter's innovator has a limited role to play in an underdeveloped country.

5. Institutional Changes and not Innovations Needed. To start the development process and to make it self-sustaining, it is not innovations alone

but a combination of several factors like organizational structures, business practices, skilled labour and appropriate values, attitudes and motivations which are required.

6. Assimilation of Innovations. According to Henry Wallich, the development process in underdeveloped countries is based, not on innovation, but on the assimilation of existing innovations. For entrepreneurs in underdeveloped countries are not in a position to innovate. Rather, they adopt innovations taking place in advanced countries.[6]

7. Neglects Consumption. The Schumpeterian process is 'production oriented' while the development process is 'consumption-oriented'. This appraisal is applied in the current trend towards the welfare state in which demand and consumption play a leading role.

8. Neglects Savings. Schumpeter's exclusive emphasis on bank credit obscures the role of real savings in investment. It also undermines the importance of deficit financing, budgetary savings, public credit and other fiscal measures in economic development.

9. Neglects External Effects. According to Schumpeter, development is the result of changes that arise from within the economy. But in underdeveloped countries, changes do not take place from within the economy rather they are the outcome of imported ideas, technology and capital. Backward technology, low saving potential and outmoded social, economic and political institutions are incapable of leading to development from "within" in underdeveloped economies.

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5. *Ibid*., pp. 99 and 101.

6. Henry C. Wallich, Some Notes Towards a Theory of Derived Demand, in Aggrawal and Singh (ed), *op.cit*., pp. 193-202.

10. Neglects Population Growth. Further, Schumpeter failed to take into account the impact of the growth of population on the economic development of a country. High growth rate of population tends to lower the growth rate of a developing economy.

11. Unsatisfactory Explanation of Inflationary Forces. In Schumpeter's system, inflationary impulses form an integral part of the process of development, but it involves no secular inflation. The long-term price level remains stable. However, in an underdeveloped economy the inflationary forces are very powerful.

Conclusion. All the same, Schumpeter's theory underlines the importance of inflationary financing and innovations as the main factors in economic development. Inflationary financing is one of the potent methods which every underdeveloped country tries to use at one time or another. His analysis is relevant to underdeveloped countries from the standpoint of long range increase in productivity and absorption of surplus labour in gainful employment as a result of innovations.

CHAPTER

The Keynesian Theory

The Keynesian theory does not analyse the problems of underdeveloped economies. It has relevance to advanced capitalist countries. But in order to find out how far the Keynesian theory is applicable to underdeveloped economies, it is better to summarise Keynes' theory.

SUMMARY OF KEYNES[1] THEORY

Total income is a function of total employment in a country. The greater the national income, the greater the volume of employment resulting therefrom and vice versa. The volume of employment depends on effective demand. Effective demand determines the equilibrium level of employment and income. The effective demand is determined at the point where aggregate demand price equals aggregate supply price. Effective demand consists of consumption demand and investment demand. Consumption demand depends on the propensity to consume. The latter does not increase to the same extent as the increase in income. The gap between income and consumption can be made up by investment. If the requisite volume of investment is not forthcoming, the aggregate demand price will fall short of aggregate supply price. As a result, income and employment will fall till the gap is bridged up. Thus, variations in employment and income largely depend on investment. The volume of investment depends on the marginal efficiency of capital and the rate of interest. The marginal efficiency of capital is the expected rate of return from new capital assets. When profit expectations are high, businessmen invest more. The rate of interest, other determinant of investment, depends on the quantity of money and liquidity preference. Now investment can be raised either by raising the marginal efficiency of capital or by lowering the rate of interest. Though a rise in investment usually leads to an increase in employment. This may not happen if the propensity to consume falls at the same time. On the contrary, a rise in the propensity to consume can lead to rise in employment without increase in investment. Rise in investment leads to

increase in income, and out of the increased income, there is more demand for consumption goods which leads to further increase in income and employment. This process tends to become cumulative. As a result, a given rise in investment causes a multiple increase in income via the propensity to consume. This relationship between increment of investment and of income is called by Keynes, the multiplier *K.* The multiplier "establishes a precise relationship, given the propensity to consume, between aggregate employment and income and the rate of investment.... It tells us that, when there is an increment of aggregate investment, income will increase by an amount which is *K times* the increment of investment." The formula is $\Delta Y=K\Delta I$, and $1—l/K$ represents the marginal propensity to consume. Thus the multiplier $K=1/1—MFC$. Since the marginal propensity to consume falls with increase in income, it becomes necessary to inject large doses of investment for securing higher levels of income and employment within the economy. This, in brief, is Keynes' Theory of Employment.

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1. J.M. Keynes, *The* General *Theory of Employment, Interest and Money,* pp. 113-15.

Kenyes did not develop any systematic model of economic development in his *General Theory.* This was left to his predecessors like Harrod, Domar, Joan Robinson and others who made full use of the Keynesian tools to construct models of economic growth. It is only in an essay entitled *Economic Possibilities for Our Grand Children* that Keynes suggested an outline of the fundamental conditions of economic progress. "They are:

(*i*) our power to control population;

(ii) our determination to avoid civil war and dissension;

(iii) our willingness to entrust to science, the direction of those matters which are properly the concern of science; and

(iv) the rate of accumulation as fixed by the margin between our production and our consumption."[2]

So far as the future of capitalism is concerned, Keynes was optimistic. He may be said to be a "prophet of boom." Keynes regarded capitalism as a mechanism

possessing great resilience and adaptability to mould itself according to circumstances. Keynes developed his theory of capitalist breakdown (secular stagnation) based on general overproduction, chronic under-consumption, and the declining marginal efficiency of capital in future. The remedy he proposed was "deliberate state action."

APPLICABILITY OF KEYNES' THEORY TO UNDERDEVELOPED COUNTRIES

The Keynesian theory is not applicable to every socio-economic set-up. It only applies to advanced democratic capitalist economies. As Schumpeter wrote, "Practical Keynesianism is a seedling which cannot be transplanted into foreign soil; it dies there and becomes poisonous before it dies. But left in English soil, this seedling is a healthy thing and promises both fruit and shade. All this applies to every bit of advice that Keynes ever offered."[3]

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2. J.M. Keynes, *Essays in Persuasion, p.* 373.

3. J.A. Schumpeter, *Ten Great Economists, op. cit.*, p. 275.

Before we study the applicability of Keynesian economics to underdeveloped countries, it is essential to analyse the assumptions of Keynesian economics vis-a-vis the conditions prevailing in underdeveloped economies.

KEYNESIAN ASSUMPTIONS AND UNDERDEVELOPED COUNTRIES

The Keynesian economics is based on the following assumptions which limit its applicability to underdeveloped countries:

Cyclical Unemployment. The Keynesian theory is based on the existence of cyclical unemployment which occurs during a depression. It is caused by deficiency in effective demand. Unemployment can be removed by an increase in the level of effective demand. But the nature of unemployment in an underdeveloped country is quite different from that in a developed economy. In such economies unemployment is *chronic* rather than cyclical. It is not due to lack of effective demand but is the result of deficiency in capital resources.

Apart from chronic unemployment, underdeveloped countries suffer from disguised unemployment. Keynes was concerned with the removal of involuntary unemployment and the problem of economic instability. So he did not refer to disguised unemployment and its solution. The remedy to the chronic and disguised unemployment is economic development to which Keynes paid no attention at all. Thus, the Keynesian assumptions of cyclical unemployment and economic instability are hardly tenable in an underdeveloped economy.

Short Period Analysis. The Keynesian economics is a short period analysis in which Keynes takes "as given the existing skill and quantity of available labour, the existing quantity and quality of available equipment, the existing technique, the degree of competition, the tastes and habits of the consumer, the disutility of different intensities of labour and of the activities of supervision and organisation as well as social structure."[4] The development economics, however, is a long period analysis in which all the basic factors, assumed by Keynes as given, change over time.

Closed Economy. The Keynesian theory is based on the assumption of a closed economy. But Underdeveloped countries are not closed economies. They are open economies in which foreign trade plays a dominant role in developing them. Such economies primarily depend on the exports of agricultural and industrial raw materials and the import of capital goods. Thus the Keynesian economics has little relevance to underdeveloped countries in this respect.

Excess Supply of Labour and Complementary Factors. The Keynesian theory assumes an excess supply of labour and other complementary resources in the economy. The analysis refers to a depression economy where "the industries, machines, managers and workers, as well as consumption habits, are all there, only wanting to resume their temporarily suspended functions and role."[5] But in underdeveloped economies there is no temporary suspension of economic activity. Economic activity is static. Capital, skills, factor supplies and economic infrastructure are woefully lacking.

Labour and Capital Simultaneously Unemployed. Moreover, it can be inferred from the above assumption that labour and capital are unemployed simultaneously, according to the Keynesian analysis. When labour is

unemployed, capital and equipment are also not fully utilized or there is excess capacity in them. But this is not so in underdeveloped countries. When labour is unemployed, there is no question of capital being unutilized because there is acute shortage of capital and equipment.

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4. J.M. Keynes, *op.cit.*, p. 245, note l.

5. A.O. Hirschman, *The Strategy of Economic Development*, p. *54*.

TOOLS OF KEYNESIAN ECONOMICS AND UNDERDEVELOPED COUNTRIES

Thus, the assumptions on which the Keynesian theory is based are not applicable to the conditions prevailing in underdeveloped countries. We now study the principal *tools* of the Keynesian theory to test their validity to underdeveloped countries.

1. Effective Demand. Unemployment is caused by deficiency of effective demand, and to get over it, Keynes suggested the stepping up of consumption and non-consumption expenditures. In an underdeveloped country, however, there is no involuntary unemployment but disguised unemployment. Unemployment is caused not by lack of effective demand but by lack of complementary resources. The concept of effective demand is applicable to those economies where unemployment is due to excess savings; and in such a situation the remedy lies in stepping up the levels of consumption and investment through various monetary and fiscal measures. But in an underdeveloped economy, income levels are extremely low, the propensity to consume is very high and savings are almost nil. All efforts to increase money income through monetary and fiscal measures will, in the absence of complementary resources, lead to price inflation. Here the problem is not one of raising the effective demand but one of raising the levels of employment and per capita income in the context of economy development. “The economic progress consists of two distinct categories; one, where given the level of economic development, you move from low employment to full employment, and the other, where you move from full employment at a given level of economic development to full employment at the next higher level of economic development. The Keynesian thesis applies only to *the first*

category."[6]

2.Propensity to Consume. One of the important tools of Keynesian economics is the propensity to consume which highlights the relationship between consumption and income. When income increases, consumption also increases but by less than the increment in income. This behaviour of consumption further explains the rise in saving as income increases. In underdeveloped countries the relationship between income, consumption and saving do not hold. People are very poor and when their income increases, they spend more on consumption goods because their tendency is to meet their unfulfilled wants. The marginal propensity to consume is very high in such countries, whereas the marginal propensity to save is very low. The Keynesian economics tells us that when the MPC is high, consumer demand, output and employment increase at a faster rate with the increase in income. But in an underdeveloped country it is not possible to increase the production of consumer goods due to the scarcity of co-operant factors, when consumption increases with the rise in income. As a result, prices rise instead of a rise in the level of employment.

3. Propensity to Save. On the saving side, Keynes regarded saving as a social vice for it is excess of saving that leads to a decline in aggregate demand. Again, this idea is not applicable to underdeveloped countries because saving is the panacea for their economic backwardness. Capital formation is the key to economic development, and capital formation is possible through increased saving on the part of people. Underdeveloped countries can progress by curtailing consumption and increasing saving, as opposed to the Keynesian view of raising consumption and reducing saving. To underdeveloped countries, saving is a virtue and not a vice.

4. Marginal Efficiency of Capital. According to Keynes, one of the important determinants of investment is the marginal efficiency of capital. There is an inverse relationship between investment and MEC. When investment increases, the MEC falls, and when investment declines, the MEC rises. This relationship is however not applicable to underdeveloped countries. In such economies, investment is at a low level and the MEC is also low. This paradox is due to lack of capital and other resources, small size of the market, low income, low demand, high costs, underdeveloped capital and money markets, uncertainties,

etc. All these factors keep the MEC (profit expectations) and investment at a low level.

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6. V.K.R.V. Rao, *Essays in Economic Development,* op. cit.,p. 61. Italics mine.

5. Rate of Interest. The rate of interest is the second determinant of investment in the Keynesian system. It is, in turn, determined by liquidity preference and the supply of money. Of the motives for liquidity preference, the transaction and precautionary motives are income elastic and they do not influence the rate of interest. It is only the demand for money for the speculative motive that affects the rate of interest. In underdeveloped countries, the liquidity preference for transaction and precautionary motives is high and for the speculative motive low. Therefore, liquidity preference fails to influence the rate of interest. The other determinant of the interest rate is the supply of money. According to Keynes, increase in the supply of money lowers the interest rate and encourages investment, income and the level of employment. But in underdeveloped countries, an increase in the supply of money leads to rise in prices rather than to the fall in interest rate. The rate of interest in such countries is not influenced so much by the demand for and supply of money as by traditions, customs and institutional factors.

6. The Multiplier. Prof. V.K.R.V. Rao has analysed the feasibility of applying the Keynesian multiplier theory and policy implications to an underdeveloped country like India.[7] According to Rao, Keynes never formulated the economic problems of underdeveloped countries, nor did he discuss the relevance to these countries of either the objective or the policy that he proposed for the more developed countries. The result has been a rather unintelligent application of Keynesian economics to the problems of underdeveloped countries.

The Keynesian concept of multiplier is based on the following four assumptions:

(*a*) Involuntary unemployment.

(b) An industrialized economy where the supply curve of output slopes upward towards the right but does not become vertical till after a *substantial*

interval.

(*c*) Excess capacity in the consumption goods industries.

(d) Comparatively elastic supply of the working capital required for increased output.

Given these assumptions, if we apply the multiplier theory on underdeveloped countries, the value of the multiplier will be apparently much higher than even in a developed country. We know that the multiplier depends on the size of the marginal propensity to consume. Since in an underdeveloped country the marginal propensity to consume is fairly high, small increments of investment are likely to induce full employment much earlier than in a rich country where the marginal propensity to consume is low. This is something paradoxical and contrary to facts. For the assumptions on which the multiplier theory is based do not hold valid in the case of an underdeveloped country. Let us test them in the light of conditions prevailing in an underdeveloped country like India.

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7. The analysis that follows is based on V.K.R.V. Rao, *op. cit.*, Ch. 2.

(a)Involuntary Unemployment. Involuntary unemployment in the Keynesian analysis is associated with a capitalist economy where the majority of workers work for wages and where production is more for exchange than for self-consumption. According to Prof. Dasgupta, the organised sector of an underdeveloped economy, with its large-scale industries and fairly well-developed banking system, comes under the scope of Keynesian economics, for it presents the features of a capitalistic economy. But involuntary unemployment in this sector is insignificant when considered in relation to the total working population of the country.[8]

In fact, in an overpopulated underdeveloped country there exists disguised unemployment. In such an economy, the existence of disguised unemployment instead of involuntary unemployment hinders the working of the multiplier theory. The secondary, tertiary and other effects of the initial increment of investment do not follow mainly because there is no labour force willing to accept employment at the current wage level. The disguised unemployed are not available at the current wage level because, *firstly,* they are not conscious

of the fact that they are unemployed, and *secondly*, they are already receiving a real income which gives them atleast as much satisfaction as they would get from the current wage level. Thus, the absence of involuntary unemployment and the presence of disguised unemployment in underdeveloped countries retard the operation of the multiplier towards increasing output or employment.

(*b*) **Inelastic Supply Curve of Output.** The supply curve of output in an underdeveloped country is inelastic which renders the working of the multiplier all the more difficult. The reason is that the nature of the consumption goods industries is such that they are unable to expand output and offer more employment. The main consumption goods industry in an underdeveloped country is agriculture which is almost stagnant. The supply curve of agricultural output is backward sloping so that an increase in the value of output does not necessarily lead to an increase in the volume of output. This is because in the short run necessary facilities are not available to the agricultural producers for increasing output. As a result, the secondary, tertiary and other increases in income, output and employment do not come about with an initial increment of investment. The primary increase in income is spent on food and its multiplier effect is lost.

Since the marginal propensity to consume is high in underdeveloped countries, the increased income is spent on self-consumption, of food products by the farmers which leads to a reduction of the marketable surplus of foodgrains. This, in turn, leads to a rise in the prices of foodgrains in the non-agricultural sector without a rise in aggregate real income. The possibility of spending more by the agriculturists on non-agricultural goods is, however, limited because there is little excess capacity in industries. Output is difficult to increase due to non-availability of sufficient raw materials, capital equipment and skilled labour. Thus, concludes Dr. Rao, "the primary increase in investment, and therefore, increase in income and employment leads to a secondary and a tertiary increase in income but not to any noticeable increase in output or employment, either in the agricultural or the non-agricultural sector. The multiplier principle, therefore, works with reference to money income but not with reference either to real income or employment."

Similarly, the absence of conditions (*c*) and *(d)* in an underdeveloped country renders the operation of the multiplier difficult. Absence of excess capacity in

consumption goods industries coupled with a comparative inelastic supply of working capital for increasing output prevent the required increase in the output of consumption goods industries and the resultant therein.

Thus, the obvious conclusion is that the Keynesian principle of multiplier does not operate in an underdeveloped country like India mainly due to two reasons: *firstly,* involuntary unemployment of the Keynesian type is not to be found; and *secondly,* the supply of agricultural and non-agricultural output is inelastic due to the working of certain factors peculiar to such economies.

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8. A.K. Dasgupta, *Planning and Economic Growth,* pp. 32-33.

7. Policy Measures. Not only this, even the Keynesian policy prescriptions are hardly tenable under the conditions prevailing in underdeveloped countries. Rao maintains that an attempt to increase investment through deficit financing leads to an inflationary rise in prices rather than to an increase in output and employment. He is, therefore, of the view that "the economic policy of deficit financing and disregard for thrift advocated by Keynes for securing full employment does not apply in the case of an underdeveloped country." But in another essay "*Financing for Capital Formation and Price Behaviour in an underdeveloped Economy,*" he contends that deficit financing for capital formation does not lead to inflation since it is used for increasing the capacity and thereby imparting elasticity to the supply curve of output. However, a certain measure of price rise is inevitable but it is of a "self-liquidating character." He points out that "the only question is the extent to which it is wise to resort to deficit financing; and the obvious answer is that deficit financing should not be resorted to beyond the point at which it becomes inflationary."

Dasgupta advocates the use of the Keynesian policy of public investment to achieve a higher standard of living and to provide increasing employment opportunities in underdeveloped countries. But in the absence of adequate public savings and the flow of foreign capital, he advocates deficit financing which if not accompanied by a system of price and capital issue controls, in the transitional period, will lead to inflationary rise in prices. According to Rao, in underdeveloped countries "the old-fashioned prescription of 'work harder and save more' still seems to hold as the medicine for economic progress" than the Keynesian hypothesis that consumption and investment should be increased

simultaneously. But it cannot be denied that though the Keynesian policy prescriptions do not apply *in toto* to the problems of underdeveloped countries, yet the Keynesian tools of analysis are indispensable for understanding the problems of such economies.

To conclude with Dasgupta: "Whatever the generality of the *General Theory* may be in the sense in which the term '*general*' was used by Keynes, the applicability of the propositions to the *General Theory* to conditions of an Underdeveloped economy is at best limited."[9]

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9. *Ibid*.,p.34.

CHAPTER

Marx' Stages of Growth

Marx's analysis of stages of growth is based on his 'materialistic interpretation of history' in which he attempts to show that all historical events are the result of a continuous struggle between different classes and groups in society. The main cause of this struggle is the conflict between 'the mode of production' and 'the relations of production'.

The mode of production relates to a particular arrangement of production in a society that determines its entire social, political and religious way of living. People use the mode of production by entering into mutual relations. Marx's calls these relations as the 'relations of production' which are continually changing. The relations of production relate to the class structure of society uniquely characterised by (*i*) the organisation of labour in a scheme of division (of labour) and co-operation, the skills of labour, and the status of labour in the social context with respect to degrees of freedom or servitude; (*ii*) the geographical environment and the knowledge of the use of resources and materials; and (*iii*) the technical means and processes and stage of science generally.[1] Thus Marx relies upon his materialistic interpretation of history to develop his theory of stages of growth.

According to Marx, historically society has passed through five different stages: primitive communal, slave, feudal, capitalist and socialist. We will study them one by one.

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1. M.M. Bober, *Karl Marx's Interpretation of History,* p. 24.

1. THE PRIMITIVE COMMUNAL STAGE

The primitive communal stage was the first stage in the evolution of society. During this stage, man succeeded in advancing from the use of sticks and stones to making new implements like bows and arrows, boats, etc. Man also

learnt how to make fire.

People lived in groups and in clans based on consanguineous ties. They lived in common dwellings, and worked on common lands with common tools. The products they produced were shared equally. But whatever they obtained was hardly enough for subsistence. Thus the relations of production were based on the common ownership of the means of production. The productive forces developed slowly but steadily. The primitive society developed and improved its work from gathering natural products like fruits, berries, etc., to cultivation of crops, and from hunting wild animals to raising livestock. The development of new tools and implements increased the skills and productivity of labour. The use of metal tools, the wooden plough with a metal plough-share, the metal axe, etc. made labour more productive.

Later on, this led to the development of different crafts and occupations for making tools, implements, weapons, clothing, etc. within the community.

The barter system began to develop when people started exchanging products and paying for work in the form of products.

With the social division of labour, the clan began to break into families. This led to the institution of private property whereby the family became the owner of the means of production. But the head of the former clan was the real head of families who owned the means of production. In this process of social evolution, some producers began to produce more products than required for the subsistence of the families. This led to the appropriation of the surplus produced by them and to the exploitation of others. This paved the way for emergence of the slave society.

2. THE SLAVE STAGE

In the slave stage, the development of productive forces was based on the corresponding production relations. In these relations, the slave-owner owned both the means of production and the slave alongwith whatever he produced.

The production relations in the slave society gave rise to such slave-owning city-stages as Rome and Greece, having different organs of coercion and exploitation. They were the government machinery, court, army, etc. This

superstructure was meant to defend private property and exploitation.

The productive forces were further developed in this society. With improved tools, implements and irrigation facilities, labour productivity in agriculture increased. Ore mining and smelting of metals began. There were crushing and flour mills. Canals were built, dykes and water raising devices were used to irrigate land.

The division of labour spread alongwith various crafts such as weaving, tanning, cloth and footwear making, pottery making, metal smelting and forging, weapon making, etc. With the growth of states, towns grew up, commerce and trade developed both internally and externally. This led to the construction of buildings and ship building.

In the slave society, there existed domination, coercion, subjugation and exploitation of slaves by a few slave-owners. For sometime, slaves were used as the main productive force. But with the passage of time, the slave society's class structure led to the conflict between the productive forces and the relations of production. As a result, the exploited slaves rose against their enslavers which overthrew the entire structure of the slave society and on its ruins rose the feudal system.

3. THE FEUDAL STAGE

In the feudal stage, the development of productive forces was based on feudal relations of production where the feudal lord owned the land and the serfs as the main means of production. The serfs worked like slaves for the feudal lord. They performed all kinds of services like cultivating the land and doing all kinds of jobs alongwith their family members for the feudal lord. But unlike in the slave society, the peasants could own a plot of land, livestock, farming tools and implements, etc. They worked for both the feudal lord and for themselves. The serfs were also required to pay a part of their produce to the landlords.

The state grew on the strength of the feudal lords who often had their own armies and helped the monarchy to expand its frontiers. The state, in turn, tried to preserve and consolidate feudal private property and the relations of production.

Productive forces continued to develop under the feudal society. There was much progress in agriculture. Varieties of grains, vegetables and fruits were cultivated. Fertilisers and rotation of crops were introduced. The output of animal products was increased by animal husbandry. Draught animals were employed on a wider scale for farming, transportation, etc. Crafts were further developed with inventions of new machines, tools and implements, especially in textile production. People learnt harnessing water and wind power by making water mills and wind mills. They discovered the art of paper making and book printing.

As the productive forces continued to develop, small handicraft workshops gave place to manufacturing units under one roof with a large number of workers. This led to large division of labour and specialisation which raised labour productivity. The manufacturing process was further encouraged by the discovery of new countries like America, India, etc. which spread the demand for manufactured products to them.

Feudalism gave rise to two types of class struggle: *one*, between the serfs and the feudal lords, and *two*, between the proletariat and the urban bourgeoisie. This led to revolutions which replaced the feudal relations of production with the capitalist relations.

4. THE CAPITALIST STAGE

In the capitalist stage, the capitalist owns the means of production and uses them for individual profit. The worker is free to work for any capitalist. He does not have any means of production. But he sells his labour power which leads to his exploitation. According to Marx, labour power is like any other commodity. The value of labour power is the value of the means of subsistence (commodities) necessary for the maintenance of the labourers, which is determined by the number of hours necessary for its production. But the value of commodities necessary for the subsistence of the labourer is never equal to the value of the commodite produced by him. Therefore, the capitalist forces the labourer to work for longer hours.[2] The extra hours he works, he receives nothing. Marx calls, it “surplus labour”. This leads to “surplus value” which increases the capitalist’s profit.

But it is not possible to increase the working hours because the workers resist it. Therefore, the capitalists increase the productivity of labour in order to raise the surplus value or profit. For this, they bring technological changes (i.e. increase in constant capital) so as to raise output and lower the cost of production. This had been the process of capitalist development in its early stage. .

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2. If a labourer works for ten hours, but it takes him six hours' labour to produce goods for his subsistence, the four hours' labour he puts in is surplus labour or value which goes to the capitalist as profit,

In the next stage, there has been concentration of capital in big enterprises, called monopolies, engaged in the production and marketing of commodities in bulk. To earn high profits, they introduce labour-saving machines to raise labour productivity. These capitalists who are unable to replace labour by new machines are "squeezed out" and their enterprises are taken over by big capitalists.

The process of replacing labour by machines creates an industrial reserve army which increases as capitalism develops. But when the capitalist is replacing the workers by machines and increasing the industrial reserve army (the unemployed), he is reducing the surplus value. This reduces his profit. The increase in unemployment and reduction in profit lead to a capitalist crisis. Marx compares the capitalist to a sorcerer whose incantations bring into action such powerful forces that he is unable to control them. Ultimately, capitalism leads to a fierce class struggle between the proletariat and the bourgeoisie. This provides the economic basis for the revolutionary transformation from capitalism to socialism.

5. THE SOCIALIST OR COMMUNIST STAGE

The last stage is communism which is brought about by the proletarian revolution whereby the "dictatorship of the proletariat" is established. According to Marx, in this stage, the state will "wither away" and each individual will contribute to the national product according to his abilities and receive according to his needs.

But the followers of Marx refer to the socialist stage in which the means of

production are owned and regulated by the state. The reward of every person is determined on the principle of "each according to his ability and each according to his needs." There is no class struggle. Neither the exploiter nor the exploited exist. The entire production and distribution is controlled and regulated by a central planning authority for public welfare.

Prof. Lange divides the socialist stage into two main parts. He calls the slave, feudal and capitalist stages as *antagonistic* because the owners of factors of production exploit the labourers in them. On the other hand, the primitive and socialist stages are *non-antagonistic* because the ownership of factors of production is in the hands of the common man and the society and there is no exploitation of workers.

MARX VS. ROSTOW

The stages of growth theories of Marx and Rostow have both similarities and differences which are discussed as under:

Similarities

Rostow presented his *Stages of Economic Growth* as an alternative to Marx's stages. He described his *Stages of Economic Growth* as a Non-communist Manifesto as against Marx's *Communist Manifesto*. Like Marx, Rostow also gave five stages of growth through which an economy has to pass. Both interpret the evolution of society from an economic perspective.

Differences

The following are the differences between the Marxian and the Rostowian theories :

1. Marx's theory of stages of growth is based on the economic interpretation of history. Marx provides the actual process of the stages of growth of the society right from the origin of mankind to the present. For this, he develops the theory of Historical Materialism based on the changes in the mode of production and consequent changes in the relation of production. But Rostow does not provide any specific theory of the stages of economic growth. He explains only some characteristics which move an economy from one stage to

another.

2. Marx's explanation of the stages of economic growth is based on interaction between economic and non-economic factors. On the other hand, Rostow does not explain such a relationship between economic and non-economic factors in the growth process.

3. Marx's theory is highly consistent with historical facts in the economies of his age. It logically explains how one stage contains within itself the necessary elements for the next stage. But Rostow simply provides the classification of an economy into the various stages of growth.

4. Marx gives a realistic explanation of the stages of growth based on the actual evolution of the society. On the other hand, Rostow provides empirical evidence in support of his different stages but these evidences are not consistent and definite.

CHAPTER

Rostow's Stages of Economic Growth

Prof. W.W. Rostow has sought an historical approach to the process of economic development. He distinguishes five stages of economic growth, *viz.*, *(1)* the traditional society; (2) the pre-conditions for take-off; (3) the take-off; (4) the drive to maturity; and (5) the age of high mass-consumption.

THE TRADITIONAL SOCIETY

A traditional society has been defined as "one whose structure is developed within limited production functions based on pre-Newtonian science and technology and as pre-Newtonian attitudes towards the physical world."[1] This does not mean that there was little economic change in such societies. In fact, more land could be brought under cultivation, the scale and pattern of trade could be expanded, manufactures could be developed and agricultural productivity could be raised alongwith increase in population and real income. But the undeniable fact remains that for want of a regular and systematic use of modern science and technology 'a ceiling existed on the level of attainable output per head. It did not lack inventiveness and innovations, but lacked the tools and the outlook towards the physical world of the post-Newtonian era.

1. W.W. Rostow, *The Stages of Economic Growth,* 1960. Also, the *Process of Economic Growth,* 1953, Trends in the Allocation of Resources in Secular Growth, Ch. 15 in *Economic Progress,* (ed.) L.H. Dupriez and D.C. Hague, 1955; The take-off into Self-Sustained Growth', in Aggarwal & Singh, *op. cit.;* "The Stages of Economic Growth," *Economic History Review,* August, 1969.

The social structure of such societies was hierarchical in which family and clan connections played a dominant role. Political power was concentrated in the regions, in the hands of the landed aristocracy supported by a large retinue of soldiers and civil servants. More than 75 per cent of the working population was engaged in agriculture. Naturally, agriculture happened to be the main source of income of the state and the nobles, which was dissipated on the

construction of temples and other monuments, on expensive funerals and weddings and on the prosecution of wars.

THE PRE-CONDITIONS FOR TAKE-OFF

The second stage is a transitional era in which the pre-conditions for sustained growth are created. The pre-conditions for sustained growth were created slowly in Britain and Western Europe, from the end of the 15th and the beginning of the 16th centuries, when the Medieval Age ended and the Modern Age began. The pre-conditions for take-off were encouraged or initiated by four forces: The New Learning or Renaissance, the New Monarchy, the New World and the New Religion or the Reformation. These forces led to 'Reasoning' and 'Scepticism' in place of 'Faith' and 'Authority', brought an end to feudalism and led to the rise of national states; inculcated the spirit of adventure which led to new discoveries and inventions and consequently the rise of the bourgeoisie—the elite—in the new mercantile cities. Thus these forces were instrumental in bringing about changes in social attitudes, expectations, structure and values. Generally speaking, the preconditions arise not endogenously but from some external invasion. For example, the pre-conditions ended in Europe (excluding Britain) with the domination of Napoleon Bonaparte whose victorious armies set in motion new ideas and attitudes which brought about changes in the structure of traditional societies and paved the way for the unification of Germany and Italy.

In any case, the process of creating pre-conditions for take-off from traditional society follows along these lines:

"The idea spreads that economic progress is possible and is a necessary condition for some other purpose, judged to be good; be it national dignity, private profit, the general welfare, or better life for the children. Education for some atleast, broadens and changes to suit the needs of modern activity. New types of enterprising men come forward in the private economy, in government, or both, willing to mobilize savings and to take risks in pursuit of profit to modernization. Banks and other institutions for mobilizing capital appear. Investments increase, notably in transport, communications and in raw materials in which other nations may have an economic interest. The scope of commerce, internal and external, widens. And here and there, modern

manufacturing enterprise appears, using the new methods."[2]

The pre-conditions for sustained industrialization, according to Rostow, have usually required radical changes in *three* non-industrial sectors:

First, a build-up of social overhead capital, especially in transport, in order to enlarge the extent of the market, to exploit natural resources productivity and to allow the state to rule effectively.

Second, a technological revolution in agriculture so that agricultural productivity increases to meet the requirements of a rising general and urban population.

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2. *Ibid.*,pp. 6-7.

Third, an expansion of imports, including capital imports, financed by efficient production and marketing of natural resources for exports.

The continuous development and expansion of modern industry was mainly possible by the ploughing back of profits into fruitful investment channels. As Rostow says: "The essence of the transition can be described legitimately as a rise in the rate of investment to a level which regularly, substantially and perceptibly outstrips population growth."

The role of social and political factors in creating pre-conditions has already been explained in the beginning of this 'stage'. But the political forces deserve further explanations with reference to underdeveloped countries and colonial territories.

It was "*reactive nationalism*"—reaction against the fear of foreign domination which acted as a potent force in bringing about the transition. In Japan it was the demonstration effect, not of high profits or new manufactured consumer' goods, but of the Opium War in China in the early 1840's and Commodore Perry's seven black ships, a decade later, that cast the die for modernization.

But in the colonies, the policy followed by the colonial powers to build up social overhead capital, ostensibly to meet its own requirements, helped in moving the traditional society along the transitional path. The spread of

modern education brought about a gradual transformation in thought, knowledge and attitude of the people, and a growing spirit of nationalism started resenting the colonial rule. *Lastly*, under the influence of a powerful international demonstration effect, people wanted the products of modern industry and modern technology itself.

THE TAKE-OFF

The take-off is the 'great watershed' in the life of a society "when growth becomes its normal condition . . ., forces of modernization contend against the habits and institutions. The value and interests of the traditional society make a decisive breakthrough; and compound interest gets built into the society's structure." By the phrase '*compound interest*' Rostow implies 'that growth normally proceeds by geometric progression, such as a saving account if interest is left to compound with principal.' At another place, Rostow defines the take-off "as an industrial revolution, tied directly to radical changes in the methods of production, having their decisive consequence over a relatively short period of time."

The take-off period is supposed to be short, lasting for about two decades. Rostow has given the following tentative take-off dates for those countries which are considered to be airborne:

Country	*Take-off*	*Country*	*Take-off*
Great Britain	1783-1802	Japan	1878-1900
France	1830-1860	Russia	1890-1914
Belgium	1833-1860	Canada	1896-1914
United States	1843-1860	Argentina	1935
Germany	1850-1873	Turkey	1937
Sweden	1868-1890	India & China	1952

Conditions for Take-off. The requirements of take-off are the following three related but necessary conditions:

"(1) A rise in the rate of productive investment from, say, 5 per cent or less to over 10 per cent of national income or net national product;

(2) the development of one or more substantial manufacturing sectors with a high rate of growth;

(3) the existence or quick emergence of a political, social and institutional framework which exploits the impulses to expansion in the modern sector and gives to growth an outgoing character."[3]

Let us examine these conditions in detail.

(1) Rate of Net Investment over 10 per cent of National Income. One of the essential conditions for take-off is that the increase in per capita output should outstrip the growth of population to maintain a higher level of per capita income in the economy. As Rostow explains: "If we take the marginal capital/output ratio for economy in its early stages of economic development at 3.5:1 and if we assume, as is not abnormal, a population rise 1-1.5 per cent annum it is clear that something between 3.5 and 5.25 per cent of NNP must be regularly invested if NNP per capita is to be sustained. An increase of 2 per cent per annum in NNP per capita requires, under these assumptions that something between 10.5 and 12.5 per cent of NNP be regularly invested. By definition and assumption, then, a transition from relatively stagnant to substantial regular rise in NNP per capita under typical population conditions, requires that the proportion of national product productively invested should move from somewhere in the vicinity of 5 per cent to something in the vicinity of 10 per cent."[4]

The typical case explained by Rostow is based on the supposition that the incremental capital-output ratio and the rate of population growth remain constant. It thus precludes the effects of increased labour force and improved technology on national income. However, during the take-off capital-output ratio tends to decline with the change in investment pattern and a rise in the proportion of net investment to national income takes place from 5-10 per cent, thus definitely outstripping the growth of population.

(2) Development of Leading Sectors. Another condition for take-off is the development of one or more leading sectors in the economy, Rostow regards the development of leading sectors as the 'analytical bone structure' of the stages of economic growth. There are generally three sectors of an economy:

(*a*) *Primary Growth Sectors,* where possibilities of innovation or of exploiting new or unexplored resources lead to a higher growth rate than in the rest of the economy. The cotton textiles of Britain and New England in the early stages of growth fall into this category.

(b) Supplementary Growth Sectors, where rapid growth takes place as a consequence of development in the primary growth sectors. For example, the development of railways is a primary growth sector and the expansion of iron, coal and steel industries may be regarded as a supplementary growth sector.

(*c*) *Derived Growth Sectors,* where growth takes place "in some fairly steady relation to the growth of total income, population, industrial production or some overall modestly increasing variable." For example, the production of food and the construction of houses in relation to population.

Historically, these sectors have ranged from textiles in Britain and New England to railways in the United States, the USSR, Germany and France; to modern timber cutting in Sweden. In addition, modern agriculture also forms part of the leading sectors. For example, the rapid growth of Denmark and New Zealand has been due to the scientific production of bacon, eggs, and butter, and mutton and butter respectively. Thus, "there is clearly, no one sectoral sequence to take-off, no single sector which constitutes the magic key."

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3. *Ibid., p.* 39.

4. *Ibid.,* pp. 52-53 and 57.

According to Rostow, the rapid growth of the leading sectors depends upon the presence of four basic factors:

First, there must be an increase in the effective demand of their products generally brought about by dishoarding, reducing consumption, importing capital or by a sharp increase in real incomes.

Second, a new production function alongwith an expansion of capacity must be introduced into these sectors.

Third, there must be sufficient initial capital and investment profits for the

take-off in these leading sectors

Lastly, these leading sectors must introduce expansion of output in other sectors through technical transformations.

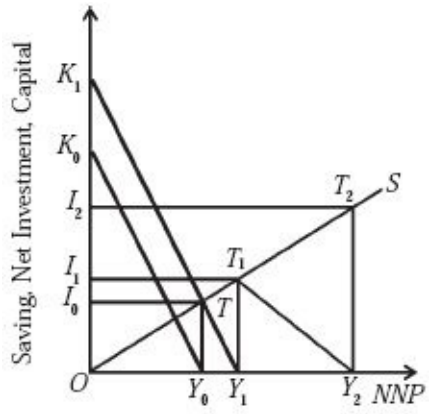

Fig. 1.

(3) Cultural Framework that Exploits Expansion. The last requirement for take-off is the existence or emergence of cultural framework that exploits the impulses to expansion in the modern sector. A necessary condition for this is the ability of the economy to mobilize larger savings out of an expanding income to raise effective demand for the manufactured products, and to create external economies through expansion of leading sectors. As Rostow says, "Take-off requires the massive set of pre-conditions, going to the heart of a society's economic organization, its politics and its effective scale of values. . . . It usually witnesses a definitive social, political and cultural victory of those who would modernize the economy over those who would either cling to the traditional society or seek other goals....By and large, *it* persuades the society to persist and to concentrate its efforts on extending the tricks of modern technology beyond the sectors modernized during the take-off."[5]

The take-off stage is explained in Fig. 1. The horizontal axis represents NNP and the vertical axis the amount of saving, net investment and capital. *S* is the saving schedule. K_0Y_0 and K_1 Y_1 are the curves of capital-output ratio drawn as downward sloping to simplify the figure. They are drawn parallel to each other to indicate a constant capital-output ratio, i.e., $OK_O/OY_O = OK_1/OY_1$. TY_O/Y_OY_1 is the marginal capital-output ratio.

To start with, the society has a very flat saving curve and a very steep capital-output ratio curve in the pretake-off stage. It implies that people save little out of their income and the capital-output ratio is very high. In the time period 0, as OI_0 net investment is made it tends to increase the capital stock which becomes productive in time period 1 and raises NNP to OY_1. Then in the take

off stage when $OI_1 (=T_1Y_1)$ investment takes place, some major stimulus leads to the growth of the productive capital more quickly leading to a fall in the capital-output ratio to T_1Y_1/Y_1Y_2. As a result, the investment pattern changes and the capital-output ratio curve becomes flatter. It is T_1Y_2. NNP increases to OY_2 which further raises net investment to $OI_2 (=T_2Y_2)$. The economy has taken off, and if this pattern of growth is continued it will become self-sustained.

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5. *Ibid.*, p. 58. Italics mine.

Thus, the take-off is initiated by a sharp stimulus, such as the development of a leading sector or a political revolution which brings an outgoing change in the production processes, a rise in proportion of net investment to over 10 per cent of national income outstripping the growth of population.

THE DRIVE TO MATURITY

Rostow defines it "as the period when a society has effectively applied the range of (then) modern technology to the bulk of its resources." It is a period of long sustained economic growth extending well over *four* decades. New production techniques take the place of the old ones. New leading sectors are created. Rate of net investment is well high over 10 per cent of national income. And the economy is able to withstand unexpected shocks.

Rostow gives the symbolic dates for technological maturity of the following countries:

Great Britain	1850	Sweden	1930
United States	1900	Japan	1940
Germany	1910	Russia	1950
France	1910	Canada	1950

When a country is in the stage of technological maturity, *three* significant changes take place:

First, the character of working force changes. It primarily becomes skilled.

People prefer to live in urban areas rather than in rural. Real wages start rising and the workers organize themselves in order to have greater economic and social security.

Second, the character of entrepreneurship changes. Rugged and hardworking masters give way to polished and polite efficient managers.

Third, the society feels bored of the miracles of industrialization and wants something new leading to a further change.

THE AGE OF HIGH MASS-CONSUMPTION

The age of high mass-consumption has been characterised by the migration to suburbia, the extensive use of the automobile, the durable consumers goods and household gadgets. In this stage, "the balance of attention of the society is shifted from supply to demand, from problems of production to problems of consumption and of welfare in the widest sense." However, three forces are discernible that tend to increase welfare in this post-maturity stage.

First, the pursuit of national policy to enhance power and influence beyond national frontiers.

Second, to have a welfare state by a more equitable distribution of national income through progressive taxation, increased social security and leisure to the working force.

Third, decision to create new commercial centres and leading sectors like cheap automobiles, houses, and innumerable electrically operated household devices, etc.

The tendency towards mass consumption of durable consumer goods, continued full employment and the increasing sense of security has led to a higher rate of population growth in such societies.

Historically, the United States was the first to reach the age of high mass consumption in 1920's, followed by Great Britain in 1930's, Japan and Western Europe in 1950's and the Soviet Union after the death of Stalin.

CRITICISM OF THE STAGES OF ECONOMIC GROWTH

"Rostow's *The Stages of Economic Growth* is the most widely circulated and highly commented piece of economic literature in recent years. Economists are one in doubting the authenticity of the division of economic history into five stages of growth' as presented by Rostow. Are these 'stages' inevitable like birth and death or do they follow a set 'sequence' like childhood, adolescence, maturity and old age? Can one tell with sufficient precision that one stage is complete and the other has begun? To maintain that every economy follows the same course of development with a common past and the same future is to overschematize the complex forces of development and to give the sequence of stages a generality that is unwarranted."[6]

Let us comment on these 'stages' in detail.

(1) Traditional Society not Essential for Development. A number of nations such as the United States, Canada, New Zealand and Australia were born free of traditional societies and they derived the pre conditions from Britain, a country already advanced. So it is not essential for growth that a country must pass through the first stage.

(2) Pre conditions may not Precede the Take-off. In the case of 'preconditions', it is not necessary that they must precede the take-off. For example, there is no reason to believe that an agricultural revolution and accumulation of social overhead capital in transport must take place before the take-off.

(3) Overlapping in the Stages. In fact, the experience of most countries tells us that development in agriculture continued even in the take-off stage. The take-off in the case of New Zealand and Denmark is attributed to agricultural development. Similarly, social overhead capital in transport, especially in railways, has been one of the leading sectors in the take-off, as Rostow himself tells us. It shows that there is considerable overlapping in different stages.

(4) Criticism of the Take-off. The most widely discussed and controversial stage is the take-off. As Cairncross has stated: "The stage that has struck the public mind most forcibly is undoubtedly that of the take-off. Largely, no doubt, because the aeronautical metaphor— prolonged in the phrase "*into self-*

sustained growth"—suggests atonce an effortlessness and finally congenial to modern thought. The reactions of historians and economists have been less favourable. They have grown accustomed to emphasizing the continuity of historical change, to tracing back to a previous age the forces producing a social explosion and to explaining away the apparent leaps in economic development. They are inclined, therefore, to regard Rostow as a latter day Toynbee, stressing a discontinuity that is no more than symptomatic of the underlying forces at work and making the symptoms more decisive than they really were."?[7]

The Take-off Dates are Doubtful. Economic historians are sceptical about the take-off dates suggested by Rostow. The dates also vary from publication to publication. For instance, the take-off year for India in the article. *The Take-off into Self-sustained Growth* was given as 1937, while in the later publications it has been put as 1952. In fact, it will take many years of research to determine the correctness or otherwise of the dates suggested by Rostow.

Possibilities of Failure not Considered. According to Habakkuk,"In his aeronautical concept of growth he (Rostow) ignored the bump downs and crash landings."

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6. G.M. Meier, *Leading Issues in Development Economics.* Prof. Habakkuk in his review of Rostow's 'Stages' wrote that "the work is essentially an essay in classification which contains some ideas on how one stage proceeds to the next, but they do not cohere into anything which could reasonably be signified as a theory of production." Italics mine.

7. A.K. Cairncross, *op. cit.*, p. 138.

Further, 'the analysis of the take-off neglects the effect of historical heritage, time of entry into the process of modern economic growth, degree of backwardness, and other relevant factors on the characteristics of the early phases of modern economic growth in different countries.'

Even the necessary conditions for take-off are not without *limitations.*

(a) Growth Rate of Investment is Arbitrary. The first condition, of a rise in the rate of productive investment to over 10 per cent of national income is arbitrary. As Das Gupta has remarked, "What is the sanctity about his particular percentage, except that with 10 per cent annual saving one may expect ,an

economy to acquire a higher trend of per capita income unless the capital-output ratio and the rate of population growth are abnormally high. A demarcation along this line is surely arbitrary."[8] Moreover, there is no historical data to justify a *sharp* increase in the *saving-income ratio* at the beginning of industralization. On the contrary, this ratio has been increasing gradually as growth proceeded.

(b) *Some Specific Industries cannot be the Leading Sectors.* The second condition relates to the rapid development of leading sectors. Rostow has laid emphasis on a limited number of leading sectors like textiles, railroads, etc. But economic growth has not always been governed by the development of a few leading sectors. **Cairncross** questions the utility of this idea in helping us understand the take-off. And there appears to be no basis on which to recognize a leading sector *exante.* He asks, "What connection is there between the conception and later stages? Why must the leading sectors be in manufacturing? If railway building can qualify, why not retail distribution or agriculture?"[9]

(c) *Little Difference between the First and Third Condition.* The last condition for take-off is the existence or emergence of a cultural framework which gives to growth an outgoing character. According to Rostow, the necessary condition for this is the 'capacity to mobilize capital, from domestic sources,' and this in fact is nothing else but the first condition of take-off restated. Moreover, as *Cairncross* opines, "A definition in these terms tells us nothing about the factors at work since we can only deduce their existence from the fact of take-off, never the likelihood of take-off from the ascertained fact of their existence."[10]

(5) The Stage of Drive to Maturity Puzzling and Misleading. It contains all the features of the take-off rate of net investment over 10 per cent of national income, development of new production techniques, leading sectors and institutions. Then where lies the need for a separate stage where the growth process becomes self-sustained. It can be self-sustained even in the take-off stage. In fact, as observed by Kuznets, "no growth is purely self-sustaining or self-limiting. The characterization of one stage of growth as self-sustained and of others, by implication, as lacking that property, requires substantive evidence and analysis not provided by Rostow."[11]

(6) The Stage of High Mass Consumption not Chronological. The age of high mass consumption is so defined that certain countries like Australia and Canada have entered this stage before even reaching maturity. According to one critic, "the period of mass-consumption is nothing else but *minus* its ideological overtone."

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8. A.K. Dasgupta, *Planning and Economic Growth*, p. 58

9. *Op. cit., p.* 142.

10. *Ibid*., p. 143.

11. In G.M. Meier, *op. cit.*

IMPORTANCE AND LIMITATIONS OF TAKE-OFF FOR UNDERDEVELOPED COUNTRIES

Importance. The concept of take-off is ideally suited for the industrialization of underdeveloped countries. As Dasgupta has written, "The term lacks precision and yet it is suggestive and can be given interpretation which is useful for an understanding of the process of economic development of an underdeveloped country. It is indeed the vagueness of the term that gives it strength for one can put an interpretation upon it to suit the conditions of the economy in which one is interested."[12]

Of the three necessary conditions for take-off, the first two, namely, capital formation over 10 per cent of national income and the development of one or more leading sectors, are helpful in the process of industrialization of underdeveloped countries. So far as the first condition is concerned, there can be little doubt about achieving that percentage. But the second condition can be moulded to suit a country's environments. For instance, the leading sectors can be in agriculture or in the production of primary products for exports. The last condition is more important in the context of underdeveloped countries where monetary and political institutions, and skills and technology are at a low level whereby they retard the expansion of the modern sector.

Limitations. From the standpoint of underdeveloped countries the take-off has the following limitations:

Capital-Output Ratio not Constant. In calculating the aggregate capital requirements of underdeveloped countries Rostow takes a constant capital-output ratio. This implies constant returns to scale. This assumption is valid in the case of advanced economies. But underdeveloped economies are characterized by the predominance of agriculture and primary production. Given unchanged techniques and increasing population, their natural resources result in conditions of diminishing returns to scale for the expansion of the economy as a whole.[13]

Silent over the Removal of Unemployment. Dasgupta regards the 'elimination of an accumulated backlog of unemployment' as 'the minimum that the take-off must accomplish' in an underdeveloped economy. According to him, "once full employment is secured the economy is raised to a level where growth is self-sustained and spontaneous." Taking India's case, he says, "Judged by the employment criterion, despite all the investment that has taken place over the period, our economy seems to be receding." Therefore, it is imperative for an over populated country to have the elimination of unemployment as one of the conditions for take-off.

Element of Ambiguity. Besides, there is an element of ambiguity in this concept of take-off when applied to an underdeveloped country. During the take-off investment increases with a rise in the national income without reducing the average propensity to consume. Technically speaking, there is an "excess of the 'marginal' rate of saving over the average rate of savings, so that the average rate keeps on rising. ... (and) the final level is characterized by a constant, though high, average rate of savings." According to Dasgupta, "This does not seem to be a sensible interpretation. For even in a highly developed economy the average rate of saving may not remain constant."

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12. *Op. cit.*, p. 156.

13. H. Myint, *The Economics of the Developing Countries*, 1964.

Economic Development not Spontaneous. The concept of take-off suggests an element of spontaneity which is of little significance in the context of an underdeveloped economy. But "a take-off is not an instantaneous process. It is an exercise that requires time and from which, after a certain speed has been attained and a portion of the runaway used up, there is no turning back or even

safe throttling down."[14]

Aeronautical Concept not Correct. Prof. R. Bicanic, however, does not agree with the symbolical presentation of the take-off, because it appears to him like a light flying animal just got cut off from the earth and floating in the air. It is like creeping over a very difficult threshold of economic development. One has to creep over it, one can't fly over it. It is not a take-off but a very painful process which every underdeveloped country has to go through.[15]

The Take-Off and India

According to Rostow, *one* of the important condition for take-off is the raising of saving and investing ratio from *5* per cent or less to over 10 per cent of national income and maintaining it for two or more decades. It is a critical transitional stage of self-sustained growth. In India at 1960-61 prices the ratio of investment of national income increased from 5.5 per cent in 1950-51 to 10.4 per cent in 1964-65 and the ratio of domestic savings to national income from 5.5 per cent to 10.5 per cent. Thus, India which entered the take-off stage in 1950-51 (1952 according to Rostow), can be definitely said to have taken-off in the year 1964-65 when both the saving and investment ratios were above 10 per cent.

The second condition for take-off is the development of one or more leading sectors in the economy. By 1964-65 the agricultural, industrial, and tertiary sectors had developed considerably. To illustrate, the index of agricultural production (with June 1950 as the base) rose from 45.6 in 1950-51 to 158.4 in 1964-65 and the index of industrial production, (with 1956 as the base) from 73.5 to 186.9. India also seems to fulfil this condition of take-off.

India also fulfils the *third* condition for take-off. Planned development has generated the cultural framework that leads to the expansion of the modern sector. The skills and attitudes of the people are undergoing changes, modern technology is permeating the traditional society and the administrative efficiency and honesty have been showing signs of improvement.

But there is no hard and fast rule for the presence of all the three conditions for take-off. Nor should one jump to the conclusion that India has definitely taken-

off during the Third Plan on the basis of the existence of the three Rostowian conditions. It appears that India has tried a premature take-off. Prof. Myint warns that a premature attempt at take-off "can result not only in wastage of scarce resources wrongly or inefficiently invested but also in a sense of disappointment and frustration which may have far-reaching psychological and political consequences." This has actually happened in the case of the Indian economy. Between 1950-51 and 1964-65, India's net national income (at 1960-61) increased at a compound rate of 3.8 per cent per annum from Rs 9,850 crores to Rs 16,630 crores but per capita income in real terms increased at an annual average rate of 1.8 per cent, the rate of population growth being 2.5 per cent per year. Coupled with these trends is the existence of inflationary pressures in the economy which cast serious doubts about India having attained the take-off stage. In the last year (1965-66) of the Third Plan, national income declined by 5.6 per cent. Per capita real income in 1965-66 was almost the same as in 1960-61. Recession in the economy during 1966-68 made matters still worse. As revealed by the Estimates Committee of the Lok Sabha in its ninth report, there was nearly 80 to 90 per cent of unutilized capacity in some industries in 1965-66 and even in the case of priority industries, idle capacity was 40 per cent. Further the rate of domestic savings declined from 10.5 per cent in 1965-66 (at 1960-61 prices) to 8.2 per cent in 1966-67 and to 8 per cent in 1967-68. In real terms, it would be even below the pre-plan period.

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14. John P. Lewis, *Quiet Crisis in India*.

15. Bicanic, R., in *Paths to Economic Growth*, (ed.) A. Datta.

The Third Plan was conceived as "the first stage of a decade or more of intensive development leading to a self-reliant and self-generating economy." It aimed at raising net investment from 11 per cent in 1960-61 to 14-15 per cent of national income and that of domestic savings from 8 per cent in 1960-61 to 11.5 per cent of national income by the end of the Third Plan. But the Third Plan failed to bring about the required rate of growth in savings and investment. Savings rose from 8 to 10.5 per cent and investment from 11 to 13 per cent. Three consecutive crop failures plunged the economy into a morass. An era of Annual Plans ensued. The Draft Fourth Plan was scrapped and postponed. However, it can be concluded in terms of Rostow's main condition of a rise in the proportion of net investment to over 10 per cent, that the Indian economy had taken-off during the Third Plan.

CHAPTER

Gerschenkron’s Great Spurt Theory

GERSCHENKRON’S GREAT SPURT THEORY

Alexander Gerschenkron[1], an economic historian, examined the traditional economies of Europe as they attempted to achieve industrialisation. He looked for similar characteristics and differences among countries and analysed the process of change in each. Consequently, he described some common stages through which underdeveloped countries must pass on the way to economic development.

According to Gerschenkron, all nations were backward once. To move from the traditional levels of economic backwardness to a modern industrial economy required a sharp break with the past, or a ‘great spurt’ of industrialisation. Many western countries like the United States, Germany, Great Britain and France experienced changes at roughly the same time and achieved partial industrialisation during the first half of the 19th century.

SIX GENERALISATIONS

Given a country’s degree of economic backwardness on the eve of its industrialisation, the course and character of its industrial development tended to change in a number of respects. Gerschenkron summed up these changes into the following six generalisations:

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1. *The Economic Backwardness in Historical Perspective,* 1962.

“1. The more backward a country’s economy, the more likely was its industrialisation to start discontinuously as a sudden great spurt proceeding at a relatively high rate of growth of manufacturing output.

2. The more backward a country’s economy, the more pronounced was the

stress in its industrialisation on bigness of both plant and enterprise.

3. The more backward a country's economy, the greater was the stress upon producers' goods as against consumers' goods.

4. The more backward a country's economy, the heavier was the pressure upon the levels of consumption of the population.

5. The more backward a country's economy, the greater was the part played by special institutional factors designed to increase supply of capital to the nascent industries, and in addition, to provide them with less decentralised and better informed entrepreneurial guidance; the more backward the country, the more pronounced was the coerciveness and comprehen-siveness of these factors.

6. The more backward a country, the less likely was its agriculture to play an active role by offering to the growing industries the advantages of an expanding industrial market based in turn on the rising productivity of agricultural labour."

According to Gerschenkron, the differences in the levels of economic development among European countries in the 19th century were sufficiently large so as to arrange them along a scale of increasing degrees of backwardness. By marking off two points on that scale, three groups of countries could be traced: advanced, moderately backward, and very backward.

COMMON CHARACTERISTICS OF NATIONS

Gerschenkron pointed towards three common characteristics of nations on the threshold of industrialisation.

First, there is sufficient supply of resources on which to base production. There may be some scarcities and obstacles, but these are not so serious as to obstruct development.

Second, there is quite a large number of population which is beginning to understand the potential benefits of industrialisation. A substantial group of people are actively trying to seek new opportunities for greater prosperity.

Third, there is 'tension' between the existing economic institutions and the groups who want new and progressive arrangements. The tension is the greatest in nations which start late on the path of development. This is because the existing economic relations in such countries are extremely backward relative to those of more developed countries.

HOW TO BRING ABOUT THE GREAT SPURT?

Severe tensions between economic backwardness and the urgency of development necessitates a big spurt of industrial development in many directions. According to Gerschenkron, for industrialisation the existence of certain "necessary conditions" was not required for industrialisation, as put forth by Rostow. He based this view on two empirical observations:

First, the preconditions for industrialisation that existed in England were either absent in the backward countries of Europe or existed on a very small scale.

Second, a big spurt of industrialisation occurred even in those countries where such preconditions were not present.

In support of his contention, he cited the example of Italy: "Before 1880, Italy's economy remained very backward in relation to the advanced industrial economies of Europe. Whatever gauge one may choose for the purposes of comparison, be it qualitative descriptions of technological equipment, organisational efficiency, and labour skills in industrial enterprises, or scattered quantitative data on relative productivity in certain branches of industry, or the number of persons employed in industry, or the density of the country's railroad network, or the standards of literacy of its population, the same conclusion will result *that the existence of necessary preconditions for industrialisation was not required."*

As pointed out above, Gerschenkron categorised countries into three groups on the basis of the degree of economic backwardness: advanced, moderately backward, and very backward. For a great spurt of industrialisation, he noted that advanced nations start their first stage of development with the factory (or private firm) in the organisational lead; moderately backward nations with banks, and extreme backward with governments. But it should not be inferred from this that industrialisation is dependent upon the creation of these

preconditions. In fact, one precondition can be substituted by another precondition. Further, preconditions can always be created even during the course of industrialisation.

Gerschenkron supported his view by citing the example of England that capital was supplied to the early factories in England from previously accumulated wealth or from gradually ploughing back of profits. But extremely backward countries which could not have these preconditions for industrialisation were compensated by the actions of banks and governments.

Gerschenkron pointed to Soviet Russia as an example of extreme backwardness relative to the industrialised Europe. Soviet Russia began its industrial development late in the 19th century as compared with central Europe. The problem of capital accumulation was more difficult in Russia than in Europe. The Russian government played a major role towards this direction in contrast to the role played by banks in the spurt of industrialisation in Europe. Massive industrialisation required sacrifices from the people. Incomes had to be used for capital investment rather than for consumption. Small family plots had to be consolidated into larger and more efficient farms. Workers had to move from rural areas into cities near factory jobs. Only the government could do that in Russia.

Leaving aside Soviet Russia which developed into a command economy, Gerschenkron gave two reasons for the increasing role of the state. According to him, the greater the degree of backwardness, the greater the role of the state in the spurt towards industrialisation.

First, in an extremely backward country, income being very low, the demand for consumer goods is also very low. This, in turn, limits the derived demand for capital goods. In the absence of profit motive, the state has to play a major role towards industrialisation.

Second, these countries lack in such sources of capital as foreign capital, banks, capital markets, etc. Accordingly, it devolves upon the state to create financial institutions for providing capital for industrialisation.

Besides, for a great spurt in industrialisation, Gerschenkron emphasised the adoption of capital intensive techniques. According to him, in an extremely

backward country, there would be a very big technological gap between its techniques of production and those of developed countries. It can, therefore, industrialise by adopting the most advanced capital intensive techniques of the latter countries for two reasons:

First, such techniques help the establishment of import-substitution industries, thereby reducing foreign competition.

Second, since backward economies have shortage of skilled labour, they use capital intensive and labour saving techniques. The more backward an economy is, the greater is the degree of capital intensity of industrialisation. Thus Gerschenkron considered the introduction of capital intensive techniques essential for economic development, for historically "borrowed technology was one of the primary factors assuring a high speed of development in a backward country entering the stage of industrialisation."

In his study, Gerschenkron measured economic development with the help of index numbers, especially in the case of USSR. He used certain biases that are found in quantity index numbers when pre-industrialisation weights are used. His study revealed that the series aggregated by pre-industrialisation weights grow much faster than the series aggregated by weights in post-industrialisation. His explanation of a quantity index being biased upwards, in binary comparison of pre and post-industrialisation weighted with base year prices, has been called the *Gerschenkron Effect*. This upward bias in base year prices weighted series is based on two facts:

(1) During industrialisation, the scarcity relations change such that the production of highly mechanical goods increases relatively more than that of less mechanical goods; and

(2) the relative prices of highly mechanical goods decrease.

Thus prices and quantities move inversely resulting in an upward bias in the base-year weighted quantity index. The divergence between the base-year weighted quantity index and the current year weighted index would be greater, the greater the extent of the opposite movements of relative quantities and prices during industrialisation.

Finally, Gerschenkron pointed out that the greater spurt in industrialisation could take place if five pre-requisites were fulfilled.

First, either the old framework in agricultural organisation should be abolished or the productivity of agriculture be increased.

Second, an influential modern elite should be created which is interested in economic change in the economy.

Third, there should be provision for material social overhead capital.

Fourth, there should be a value system which favours economic change.

Fifth, an effective entrepreneurship should be available.

CRITICAL APPRAISAL

Gerschenkron in his 'great spurt' theory studied how backward economies of Europe achieved industrialisation. He looked for similar characteristics and differences among nations based on their degrees of economic backwardness, and analysed the process of change in each country. Thus he evolved a model of development which describes the common stages through which backward economies must pass on the path to economic development.

Gerschenkron's model is significant from the standpoint of underdeveloped countries because it points towards the dangers of lingering backwardness in such countries. His detailed analysis of the USSR economy highlights the importance of the role of the state in bringing about rapid industrialisation in backward economies. But all his prescriptions do not apply to underdeveloped countries for the following reasons.

First, the experience of many underdeveloped countries has shown that export promotion is more important than import substitution not only for rapid industrialisation of such economies but also to overcome balance of payments problems.

Second, Gerschenkron justified the use of capital intensive and labour saving techniques to overcome the shortage of skilled labour. But, according to W.A.

Lewis, unskilled labour is only a temporary bottleneck in a suplus labour economy which when utilised helps in industrialisation.

Third, the six generalisations laid down by Gerschenkron which characterise the great spurt of industrialisation were derived from the economic experience of the Soviet Union. As such all of them are not applicable to the currently underdeveloped countries because economic conditions differ much in such countries from that of the Soviet Union of those times.

Fourth, the Soviet experience suggests that extreme backwardness might lead inevitably to some sort of dictatorship as the society turns into a command economy, thereby leading to loss of personal freedom. When the Soviet Union itself has chosen a free market economy now and broken the shackles of dictatorship, no underdeveloped country would be prepared to start on the path to industrialisation on the lines of the erstwhile Soviet Union.

However, this does not mean that Gerschenkron's analysis has no relevance for the currently underdeveloped economies. Rather, his analysis points out that the development process should be analysed in relation to the degree of economic backwardness of a country on the eve of its great spurt of industrialisation.

GERSCHENKRON VS. ROSTOW

Gerschenkron's study is especially related to economically backward economies. He examined the backward economies of the past in their effort to industrialise. He looked for similar characteristics and differences in them and analysed the development process in each. *Finally*, he evolved a theory of development describing the common stages through which backward economies must pass on the path to economic development.

Rostow, on the other hand, presents an analytical and systematic study of the growth process divided into five stages based on the experiences of developed countries. His analysis is, therefore, not applicable to the currently underdeveloped countries. It is only his "take-off" stage that has some relevance to the underdeveloped countries.

The only similarity between Gerschenkron and Rostow is that the 'great spurt' of Gerschenkron is closely related to Rostow's 'take-off'. "Both elements

stress the element of specific discontinuity in economic development. Great spurts are, however, confined to the area of manufacturing and mining whereas take-offs refer to national output."

Despite this, Rostow's approach to industrialisation is very narrow. According to him, every country irrespective of the degree of its economic backwardness, must pass through the same sequence of stages during its process of industrialisation. To Gerschenkron, on the other hand, the process of industrialisation was different in different countries depending on their degrees of backwardness. In this sense, Gerschenkron's approach is more realistic and has wider applicability to the present day underdeveloped countries.

There is another difference. To Gerschenkron, growth need not trace through the same set of stages in each country. The big spurt can occur at different levels of development and with different patterns depending upon the level. The more backward the country is, when it starts its development, the more likely it is to rely on governmental support more quickly it can short cut the slow growth path of the leaders. Gerchenkron finds advantages in backwardness which permit the late starter to catch up or at least narrow the distance between it and the pioneers.

CHAPTER

Nurkse's Theory of Disguised Unemployment as a Saving Potential

MEANING OF DISGUISED UNEMPLOYMENT

The concept of disguised unemployment was introduced into the theory of underdevelopment by Rosenstein-Rodan in his famous article "Problems of Industrialization of Eastern and South-Eastern Europe" and was elaborated by Ragner Nurkse. In its strict sense, it means that given the techniques and productive resources, the marginal productivity of labour in agriculture over a wide range is zero in overpopulated underdeveloped countries. It is, therefore, possible to withdraw some surplus labour from agriculture without reducing total farm output. Such unemployment is found where too many workers are engaged in agricultural operations because of the lack of alternative or complementary employment opportunities. If, for example, seven persons are engaged in cultivating a farm that could be cultivated by five, it implies that all the seven workers are not fully employed. If two are withdrawn and given some alternative job, the total output of the farm will not be reduced when five workers are left to do the same work. It means that two workers are not contributing anything to farm output and their marginal productivity is zero.

Prof. A.K. Sen does not agree with this interpretation of disguised unemployment. He asks, "If marginal productivity of labour over a wide range is zero, why is labour being applied at all?" The confusion arises from failure to distinguish between labour and labour time. In Sen's view, "It is not that too much labour is being spent in the production process, but that too many labourers are spending it. Disguised unemployment thus normally takes the form of a smaller number of working hours per head."[1] If, for instance, in a family 35 hours' work a day is done on a farm, the marginal product of the 35th hour falls to zero. Let us further assume that 7 members work on the farm for 5 hours a day. Given the same technique and production process, if two

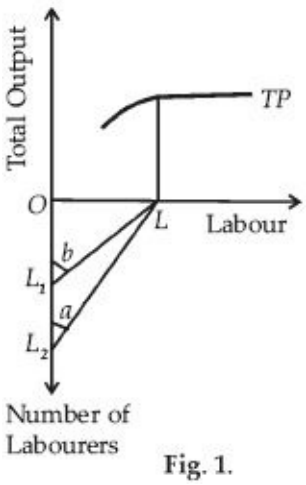

Fig. 1.

labourers go away, the remaining 5 labourers would be able to maintain the same level of output by working harder and longer for 7 hours a day. Thus there is disguised unemployment of two labourers. The amount of disguised unemployment also depends on the number of hours' work a day per labourer. If it is fixed at 7 hours a day, then again two labourers are disguised unemployed even if they work on the farm. It is thus the marginal productivity of the labourer that is nil *over a wide range* and the productivity of *labour* may be just equal to zero at the margin. Sen explains the difference between the two approaches with the help of the Fig. 1.

TP is the total output curve which becomes horizontal when *OL* labour is employed. It implies that the marginal product of labour becomes zero with *OL* labour hours and it is no use employing labour beyond this point. However, the number of labourers engaged in agricultural operations is OL_2 and each works for *tan a* hours. But the working hours per labourer are *tan b*. Thus L_2L_1 labourers are disguised unemployed. It shows that marginal productivity of *labour* is zero at point *L* and that of *labourer* over the range L_2L_1 is nil.

NURKSE'S THEORY

Ragner Nurkse[2] developed the thesis that disguised unemployment in overpopulated underdeveloped countries can be a source of capital formation. According to Nurkse, the state of disguised unemployment in underdeveloped countries constitutes "a disguised saving potential.' Underdeveloped countries suffer from disguised unemployment on a mass scale. With existing techniques of production in agriculture, it is possible to remove from land a large proportion of the surplus labour force without reducing agricultural output. This surplus labour force can be put to work on capital projects, like irrigation, drainage, roads, railways, houses, factories, training schemes, community development, education and health, etc. In this way, rural underemployment can be a source of capital formation.

Nurkse has split up the problem of mobilizing the disguised unemployed as a

saving potential in two parts:

Firstly, how to feed the surplus population transferred to the various capital projects.

Secondly, how to provide tools to the new workers to work with.

Feeding the Surplus Population. Though the first problem can be solved to some extent by voluntary savings, by taxation and even by importing foreign capital, yet the magnitude of the problem requires that it should be self-financing. At present the unproductive surplus labourers are being supported by the productive labourers. The latter are doing virtual saving since they are producing more than they consume. But this saving is running waste because it is being utilized in feeding the unproductive labourers whose contribution to output is zero or negligible. If the productive peasants working on land continue to feed their unproductive dependents working on capital projects, then their virtual saving would become effective saving. But this capital formation "through the use of surplus labour is self-financing only if the mobilization of the concealed saving potential is 100 per cent successful." Nurkse further emphasizes, "It seems to be a question of all or nothing. Either the whole of the food surplus that becomes available on the land through the withdrawal of the surplus labourers is mopped up to feed the *unproductive labourers* in their new occupations or nothing can be done at all." But the snag is that there may arise certain leakages in this food fund available for capital formation:

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1. A.K.Sen, *Choice of Techniques, pp.* 3-5.

2. R. Nurkse. *op. cit.* Ch. 11.

(a) The newly employed worker may start consuming more food than they were consuming at the farms;

*(*b*)* the peasants left behind on the farms may themselves start consuming more food than before; and

(c) the problem of bearing the cost of transporting food from the farms to the capital projects. Though it is not possible to plug these leakages fully,

Nurkse suggests that this can be done by complementary savings in other sectors of the economy, by state action in requisitioning the surplus food stocks from the peasantry, and even by meeting the deficit from imported food stocks. He also stresses the need for levying indirect taxes on commodities that enter into the peasants' budget: taxation in kind, a tax on land owners and on their rents may further help in mopping up the food surplus. Nurkse's firm conviction is that "whatever the machinery employed may be, some form of collective saving enforced by the state may prove to be indispensable for the mobilization of the saving potential implicit in disguised unemployment."

Financing of Tools. The *second* problem relates to the financing of tools to be provided to new construction project workers. Even though capital goods can be imported, yet as usual an act of domestic saving is required in this case. In some of the densely populated agricultural economies, there is not only underemployment of labour but also of capital. Due to small scattered plots, large number of farm tools, implements and draught animals are used. But if these small and scattered holdings are consolidated, certain simple tools will be released which the investment workers can use in new capital projects. Moreover, simple tools and equipment that the newly employed workers require can be made by the workers themselves with their own hands. Such simple tools can also be imported from abroad in exchange for the country's exports. But it is essential that only that capital equipment should be imported which can be easily adapted to the prevailing factor endowments in the country. As Nurkse puts it, "Much simpler tools and equipment may be appropriate to the relative factor endowments of countries of this type in the early stages of development."

To sum up, "Hands would move from the village to the new construction sites; with the hands would also move mouths; and with less mouths to feed in the village the possibility would be created for food to move out of the village to supply the needs of a swollen army of construction workers, without any fall in consumption on the part of those remaining in the village."[3] Thus a process of economic development is generated through the use of the disguised unemployed. Nurkse, therefore, rightly believes that there is concealed saving potential in rural underemployment in overpopulated underdeveloped countries that can be effectively utilized as a means of capital formation.

3. M. Dobb,*Some Aspects of Economic Development*, 1951. Dobb propounded this thesis, independent of Nurkse, in one of his lectures delivered at the Delhi School of Economics when the writer was a student.

LIMITATIONS OF THE CONCEPT

The concept of disguised unemployment as a concealed saving potential has led to considerable controversy. Economists have questioned the practicability of this concept in democratic underdeveloped economies. The various difficulties that stand in its working are examined below:

1. Propensity to Consume not Constant. Nurkse assumes that the propensity to consume of both the newly employed workers and those left on the farms remains constant. But this is an untenable assumption. Kurihara is of the view that as a result of transferring the disguised unemployed to the capital-goods sector, the propensity to consume may rise in the case of the whole economy. "In this event the pressure will increase for allocating to the consumer goods sector those resources which might otherwise be used to increase output of capital goods."[4]

2. Problems of Collection and Distribution of Food Surplus. Nurkse fails to visualise the problems connected with the mopping up and the distribution of the food surplus from those working on the farms to those working on the new capital projects. How is the food to be collected and distributed to workers at the project sites? How much each farm is to contribute to the food fund, if such a fund is created? If farm owners refuse to supply food, what action is contemplated? Nurkse's thesis does not offer any solution to these problems.

3. Marketable Surplus does not Increase. Further, it is doubtful that the withdrawal of surplus labour from agriculture would increase the marketable surplus. Kaldor holds that in underdeveloped countries, peasants produce for self-sufficiency rather than for profits and the amount supplied to the non-agricultural sector tends to be governed by the need for industrial products. Since as a result of reduction of farm hands, the demand for industrial products is also reduced, it is possible that a reduction in surplus labour force would be followed by a reduction, rather than an increase, in the amount of marketable surplus for the towns.[5]

4. Difficult to Mobilize Disguised Unemployed. It is not easy to mobilize the

disguised unemployed and send them to the new capital projects. They are so intensely attached to their family and land that they do not like to leave their kith and move to the new projects. Majority of the disguised unemployed, however, find their way into the armed forces, as is the case in India.

5. Not Possible to Get Work without Payment of Wages. In Nurkse's analysis, the problem of payment of wages to the workers does not arise because the entire process of capital formation is assumed to be self-financing. This is unrealistic. Unless wages are paid, workers cannot be attracted to the new capital projects. As Lewis remarks, "Unpaid labour may be very important in countries which resort to compulsory labour but its scope in other countries is limited."

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4. K. Kurihara, *op. cit.*, pp. 119-120.

5. N. Kaldor, *Essays on Economic Stability and Growth*, 1960.

6. Successful only in Totalitarian States. As a corollary to the above, this 'up by the bootstraps' approach can succeed only under strong totalitarian governments and has little relevance to democratic underdeveloped countries. As a matter of fact, this approach to capital formation has succeeded in China where the masses have been forced to work on capital projects by providing only minimum rations required for bare subsistence. Nurkse himself admitted this fact when he declared later on, "Some of the underdeveloped countries do have potential domestic resources available for capital construction. But it may be very hard *nay* impossible to mobilize them without resorting to coercive methods."[6]

7. Problems of Inflation and Balance of Payments. The task of providing work to the surplus labour force is beset with a number of difficulties. Lewis maintains that what holds back the use of such labour is not the lack of fixed capital but the lack of working capital. Assuming that working capital is available, the employment of surplus labour is likely to lead to inflation in the economy. When the newly employed workers are paid wages, their demand for consumer goods increases without a corresponding increase in the output of consumer goods. Hence prices will rise. "This will also stimulate imports of consumer goods, with unfortunate effect on the balance of payments, and if these effects are prevented by strict control of imports and of exports the effect

is merely to swell the sum of money circulating at home, and set to put greater pressure on the domestic prices."[7]

8. Unskilled Labour Fails to Increase the Output of Fixed Capital. According to Kurihara, the use of unskilled and ill-equipped labour may not increase significantly the output of fixed capital which is of crucial importance to industrialization. The shifting of the disguised unemployed to investment projects of a labour-intensive type requiring no special skill or equipment cannot be expected to produce fixed capital "in quantities and qualities that are of immediate and adequate use to industrialization. The most that could be expected of such labour-intensive projects is a limited amount of preliminary capital formation (*e.g*., swamp clearance of factory sites, dirt road building for modern highways, and handicrafts serving as raw materials for machine made manufactures). But it takes machines to make machines on a scale large enough to speed up industrialization. And the disguised unemployed are an ineffective substitute for such machines to make machines."[8]

9. Unrealistic Assumption of Technological Neutrality. Kurihara further maintains that the tacit assumption of technological neutrality involved in Nurkse's idea of disguised unemployment as a saving potential is untenable and unhelpful. During the process of industrialization, if the capital-goods sector adopts labour-saving devices, it will set a limit to the full mobilization of the disguised unemployed in the economy. In such a situation, capital equipment will have to grow at a much faster rate to equip labour with increasing productivity. Technological progress is thus inevitable.

10. Effects of Increasing Population on Capital Formation. To Kurihara, Nurkse fails to analyse the effects of rising population on capital accumulation. A rapidly growing population aggravates the difficulty of increasing the rate of capital formation in two ways:

"(i) there is a continuous addition to the unproductive labour force which eats up whatever saving potential is created by shifting the disguised unemployed to the new capital projects; and

(ii) this population growth outstrips capital accumulation showing thereby that disguised unemployment grows faster than can be absorbed productively

by the very stock of capital that the disguised unemployed are supposed to help expand."

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6. R. Nurkse, *Lectures on Economic Development,* p. 200. Italics mine.

7. W.A. Lewis, *op. cit.,* p. 218.

8. K. Kurihara op. cit., p. 119.

11. Not Applicable to Directly Productive Activities. Hirschman makes a distinction between 'permissive' and 'compulsive' factors in economic development. According to Nurkse, it is by employing the unproductive workers in social overhead capital projects that capital formation will take place. But Hirschman is of the view that though social overhead capital is fundamental to economic development, yet it is only a 'permissive' factor, for it simply permits private investment to go ahead. The existence of 'directively productivity activity,' on the other hand, is a 'compulsive' factor in economic development. It includes, among others, machine tools and iron and steel industries. He, therefore, contends that Nurkse's concept of converting the rural surplus labour into capital formation can have relevance only with regard to social overhead capital but not to directly productivity activities which are more significant from the viewpoint of economic development.[9]

12. Fall in Production. Schultz does not agree with Nurkse that the removal of surplus labour force from the farms to the new capital projects will not reduce agricultural productivity. He contends that there is "no evidence for any poor country anywhere that would suggest that a transfer of even some small fraction, say, 5 per cent of the existing labour force out of agriculture, with other things equal, could be made without reducing its production."[10] As Doreen Warriner has pointed out, the emphasis on overpopulation or disguised unemployment is most unfortunate because it concentrates on pure guesswork and diverts attention away from the ascertainable facts—the fall in output per head resulting from pressure of population on the means of subsistence and the destruction of soil fertility.[11]

13. Defective Empirical Evidence. Empirical evidence has shown that the estimates of 20-25 per cent of surplus labour are entirely inadequate and defective. Kao, Anschel and Eicher have shown that the empirical studies

supporting such optimistic estimates of disguised unemployment were often poorly conceived. In addition, "by considering temporary rather than permanent labour transfers and by allowing some reorganisation of production, various writers have arrived at a high percentage of disguised unemployment. To date, there is little reliable empirical evidence to support the existence of more than 5 per cent disguised unemployment in underdeveloped countries."[12]

Conclusion. The inference can be drawn from the entire discussion that the existence of disguised unemployment as a concealed saving potential and hence as a source of capital formation in overpopulated underdeveloped countries is beset with a number of difficulties and has little practicability in countries that have wedded themselves to a democratic way of living. We may thus conclude with Viner that "there is little or nothing in all the phenomena designated as 'disguised unemployment,' as 'hidden unemployment,' or as 'underemployment' which in so far as they constitute genuine social problems would not be adequately taken into account by competent, informed, and comprehensive analysis of the phenomenon of low productivity of employed labour, its causes, its true extent, and its possible remedies."[13]

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9. A.O. Hirschman, *The Strategy of Economic Development*, 1958.

10. 'The Role of Government in Promoting Economic Development' in *The State of Social Sciences* (ed.) L.D. White.

11. D. Warriner, *Land Reform and Economic Development*, 1955.

12. C.K. Eicher and L.W. Witt (eds.), *Agriculture In Economic Development*, 1964.

13. Some Reflections on the Concept of Disguised Unemployment',*IJE.*

A REALISTIC VIEW

The views expressed above are by those who are sceptical about the concept. But it cannot be denied that the use of surplus labour as the source of capital formation "brings within a narrow time-horizon projects which were outside this horizon. It gives scale economies, enlarges land, capital and employment and raises productivities all round." So far as the problem of wage payment is concerned Prof. Khusro[14] suggests three methods:

(i) Underemployed workers can be organized on their own and on their neighbours' farms on mutual aid on capital building. They need not be given a wage. They eat the same food at their own kitchens. As a result, there are no inflationary pressures on food prices.

(ii) Underemployed workers can be organized to work on capital construction within a village outside their own farms. They are given a wage. But they return to their kitchens daily to eat the same food which they would have eaten any way. They spend their wages on non-food items whose prices rise. But with a time-lag, they would produce the capital which would produce the extra food which will pay for the 'wage-goods.'

(*iii*) Underemployed workers can be organized to work on capital projects away from their villages and paid a wage. They would spend their wages on food and this will lead to inflationary pressures. "But eventually it produces the capital which produces the food which pays for the wage. The problem in all the three cases is (*a*) of organization, and *(b)* of bridging the gap between work (wage payment) and product. If these programmes are undertaken on a nationwide basis, monetary-fiscal measures become necessary." According to Khusro, the essence of the matter is organization in the field and taking up of projects with due regard to efficiency.

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14. A.M. Khusro, *Readings In Agricultural Development,* 1968.

CHAPTER

Lewis' Theory of Unlimited Supplies of Labour

THE LEWIS THEORY

Two Sector Economy. Prof. W. Arthur Lewis has developed a very systematic theory of *Economic Development with Unlimited Supplies of Labour.* [1] Like the classical economists, he believes that in many underdeveloped countries an unlimited supply of labour is available at a subsistence wage. Economic development takes place when capital accumulates as a result of the withdrawal of surplus labour from the "subsistence" sector to the "capitalist" sector. The capitalist sector is that part of the economy which uses reproducible capital and pays capitalists for the use thereof.' It employs labour for wages in mines, factories, and plantations for earning profit. The subsistence sector is that part of the economy which does not use reproducible capital. In this sector, output per head is lower than in the capitalist sector.

Lewis starts his theory with the assertion that the classical theory of perfectly elastic supply of labour at a subsistence wage holds true in the case of a number of underdeveloped countries. Such economies are over-populated relatively to capital and natural resources so that the marginal productivity of labour is negligible, zero or even negative. Since the supply of labour is unlimited, new industries can be established or existing industries expanded without limit at the current wage by drawing upon labour from the subsistence sector. The current wage is what labour earns in the subsistence sector, *i.e.*, the subsistence wage. The main sources from which workers would be coming for employment at the subsistence wage as economic development proceeds are "the farmers, the casuals, the petty traders, the retainers (domestic and commercial), women in the household and population growth." But the capitalist sector also needs skilled workers. Lewis argues that skilled labour is only a "quasibottleneck, a temporary bottleneck" which can be removed by

providing training facilities to unskilled workers.

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1. 'This is the title of an article published by W. A. Lewis in the *Manchester School,* May, 1954. Reprinted in Aggrawal and Singh, *op. cit.*. pp. 400-449. Also "Unlimited Labour" Further notes : *The Manchester School.* Jan., 1958.

Capitalist Surplus. Now the question is what determines the subsistence wage at which the surplus labour is available for employment in the capitalist sector? It depends upon the minimum earnings required for subsistence. To be precise, the wage level cannot be less than the average product of the worker in the subsistence sector. It may, however, be higher than this, if the farmers are to pay rent or food costs more or if they feel that psychic disutilities of leaving home are large. Though "earnings in the subsistence sector set a floor to wage in the capitalists sector," yet in practice capitalist wages are more than 30 per cent[2] higher than subsistence wages due to:

(*a*) a substantial increase in the output of the subsistence sector which by raising real income might induce workers to ask for a higher capitalist wage before offering themselves for employment;

(b) if with the withdrawal of labour from the subsistence sector, total product remains the same, the average product and hence the real income of those remaining behind will rise and the with drawn workers might insist on a higher wage in the capitalist sector;

(*c*) the high cost of living and some humanitarian consideration may move the employers to raise the real wage, or government may encourage trade unions and support their wage-bargaining efforts. The supply of labour is, however, considered to be perfectly elastic at the existing capitalist wage.

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2. In the 1958 article, Lewis estimated a gap of 50 per cent. In fact, the size of this margin cannot be precisely stated and will vary with local circumstances.

Capital Formation Depends on Capitalist Surplus. Capitalists aim at profit maximisation. It is they who save and automatically invest what they save. Since the marginal productivity of labour in the capitalist sector is higher than the capitalist wage, this results in capitalist surplus. This surplus is reinvested in new capital assets. Capital formation, takes place and more people are

employed from the subsistence sector. This process continues till the capital-labour ratio rises and the supply of labour becomes inelastic and the surplus labour disappears. Thus capital formation depends on the capitalist surplus. The Lewis theory can be explained with the help of Fig. 1. The horizontal axis measures the quantity of labour employed and the vertical axis, its wage and marginal product. *OS* represents average subsistence wage in the subsistence sector, and *OW* the capitalist wage. At *OW* wage in the capitalist sector, the supply of labour is unlimited, as shown by the horizontal supply curve of labour *WW*. In the beginning, when ON_1 labour is employed in the capitalist sector, its marginal productivity curve is P_1L_1 and the total output of this sector is $OP_1O_1N_1$. Out of this workers are paid wages equal to the area OWQ_1N_1. The remaining area WP_1Q_1 shows surplus output. This is the capitalist surplus or total profit earned by the capitalist sector. When this surplus is reinvested, the curve of marginal productivity shifts upwards to P_2L_2. The capitalist surplus and employment are now larger than before being WP_2Q_2 and ON_2 respectively. Further reinvestments raise the marginal productivity curve and the level of employment to P_3L_3 and ON_3 and so on, till the entire surplus labour is absorbed in the capitalist sector. After this, the supply curve *WW* will slope from left to right upwards like an ordinary supply curve, and wages and employment will continue to rise with development.

Thus, capital is formed out of *profits earned* by the capitalists. According to Lewis, if technical progress is capital-saving, it may be considered as an increment in capital, and if it is labour-saving, it may be considered as an increment in the marginal productivity of labour. As such, he does not make any distinction between the growth of technical knowledge and the growth of productive capital and treats them as a "single phenomenon" with the result that technical progress tends to raise profits and increase employment in the capitalist sector.

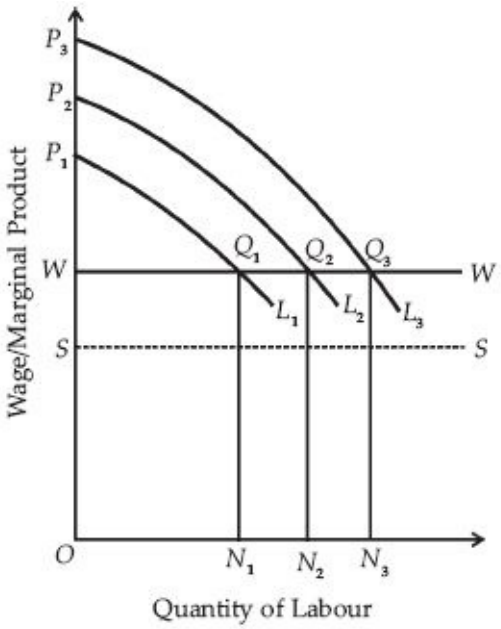

Fig. 1.

Role of the State and Private Capitalists.

"The central problem in the theory of economic development," according to Lewis, "is to understand the process by which a community which was previously saving and investing 4 or 5 per cent of its national income or less converts itself into an economy where voluntary saving is running at about 12 to 15 per cent of national income or more. This is the central problem because the central fact of economic development is rapid capital accumulation (including knowledge and skills with capital). In underdeveloped countries with surplus labour, only 10 per cent of the people with the largest income save who receive about 40 per cent of the national income. The wage and salary classes hardly save 3 per cent of the national income. But the dominant classes consisting of landlords, traders, moneylenders, priests, soldiers, princes are engaged in prodigal consumption rather than in productive investments. It is, therefore, the state capitalist and indigenous private capitalists who create capital out of profits earned. "The indigenous private capitalist is bound up with the emergence of new opportunities, especially something that widens the market, associated with some new technique which greatly increases the productivity of labour, and hence the capitalist surplus. The state capitalist, on the other hand, can accumulate capital even faster than the private capitalist, since he can use for this purpose not only the profits of the capitalist sector, but also what he can force or tax out of the subsistence sector." Thus, once a capitalist sector has emerged it is only a matter of time before it becomes sizable. If the opportunities for using capital productivity increase rapidly, the surplus will also grow rapidly, and the capitalist class with it. **Capital Formation through Bank Credit.** But capital is created not only out of profits, it is also created out of bank credit. In an underdeveloped economy which has abundant idle resources and shortage of capital, credit creation has the same effect on capital formation as profits. It will raise output and employment. Credit- financed capital formation, however, leads to inflationary rise in prices for sometime. When the surplus labour is engaged in the capitalist sector and paid out of created money, prices rise because income increases while consumer goods output remains constant. This is only a temporary phenomenon, for as soon as capital goods start producing consumption goods, prices start falling. In the words of Lewis, "Inflation for the purpose of capital formation is a very different kettle of fish. It is self-destructive. Prices begin to rise but are sooner or later overtaken by rising output, and may, in the last stage, end up lower than they were at the

beginning." The inflationary process also comes to an end "when voluntary savings increase to a level where they are equal to the inflated level of investment." As capital formation is taking place all the time, output and employment rise continuously and so do profit. Since higher profit lead to higher saving, a time will come when savings increase so much that new investments can be financed without recourse to bank credit.

This analysis also applies to the government which receives back the inflation financed money in the form of taxes. *Secondly* , when national income increases with rising output, it is not required to resort to deficit financing. Given abundant labour and scarce physical resources, the effect of capital formation either through taxation or credit creation is the same on output. Since backward economies are faced with unlimited supplies of labour, the Lewis theory is primarily concerned with this problem.

End of the Growth Process. The theory shows that "if unlimited supplies of labour are available at a constant real wage, and if any part of the profit is reinvested in productive capacity, profit will grow continuously relatively to the national income and capital formation will also grow relatively to national income." But the process of growth cannot go on indefinitely, if as a result of capital accumulation no surplus labour is left. It may also stop if despite the existence of surplus labour, real wages rise so high as to reduce the capitalist profit to the level where they are all consumed and nothing is left, for net investment. This may happen in any one of the four ways:

(*a*) if the capitalist sector expands so rapidly that it reduces absolutely the population in the subsistence sector, the average productivity of labour rises in the latter sector because there are very few people to share the product and so the capitalist wage rises in the former sector (in the diagram SS and WW will shift upwards and reduce profit);

(b) if as a result of the expansion of the capitalist sector relatively to the subsistence sector, the terms of trade turn against the former with rising prices of raw materials and food, the capitalists will have to pay higher wages to the workers;

(*c*) if the subsistence sector adopts new techniques of production, real wages would rise in the capitalist sector and so reduce the capitalist surplus; and

(*d*), if the workers in the capitalist sector imitate the capitalist way of life; and agitate for higher wages and if successful in raising their wages, the capitalist surplus and the rate of capital formation will be reduced.

In Open Economy. When capital accumulation is adversely affected by any of these factors, it can continue by encouraging mass immigration or by exporting capital to such countries as possess abundant labour at subsistence wage. Both these possibilities are, however, ruled out by Lewis himself.

First , mass immigration of unskilled labour is not possible because trade unions in the high-wage countries oppose it. They fear that labour imports would bring down wages to the subsistence level of the poorest country.

Second, the effect of capital exports is to reduce the creation of fixed capital at home and hence to reduce the demand for labour and wages in the capital-exporting country. But the reduction in wages is offset if capital exports cheapen the things which workers import because their real wages will rise. On the other hand, the reduction in wages is further encouraged if capital exports raise the cost of imported things as the real wages of workers will fall. So the effect of capital exports cannot be assessed with definiteness.

A CRITICAL APPRAISAL

The Lewis theory is applicable to overpopulated underdeveloped countries under certain set conditions. Its applicability is, therefore, circumscribed by its assumptions which are the basis of criticisms discussed below:

1. Wage Rate not Constant in the Capitalist Sector. The theory assumes a constant wage rate in the capitalist sector until the supply of labour is exhausted from, the subsistence sector. This is unrealistic because the wage rate continues to rise over time in the industrial sector of an under developed economy even when there is open unemployment in its rural sector.

2. Not Applicable if Capital accumulation is Labour Saving. Lewis assumes that the capitalist surplus is reinvested in productive capital but according to Reynolds,[3] if the productive capital happens to be labour saving, it would not absorb labour and the theory breaks down. This is shown in Fig. 2 where the

curve P_2L_2 has a greater negative slope than the curve P_1L_1, thereby showing labour-saving technique. With the shifting of the marginal productivity curve upwards from P_1L_1 to P_2L_2, the total output has risen substantially from $OP_1Q_1N_1$ to $OP_2Q_1N_1$. But the total wage bill OWQ_1N_1 and the labour employed ON_1 remain unchanged.

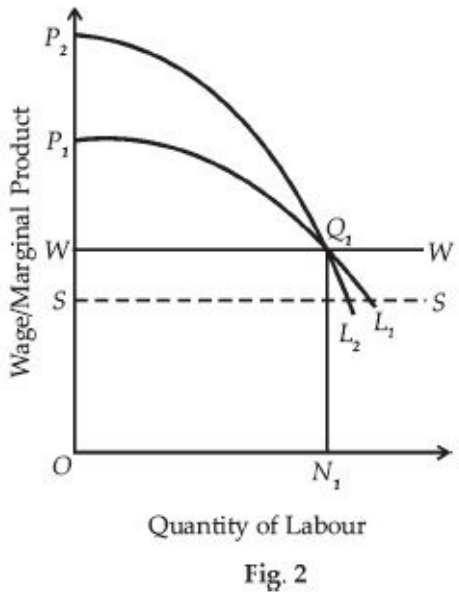

Fig. 2

3. Skilled Labour not a Temporary Bottleneck. Given an unlimited supply of labour, Lewis assumes the existence of unskilled labour for his theory. Skilled labour is regarded as a temporary bottleneck which can be removed by providing training facilities to unskilled labour. No doubt skilled labour is in short supply in underdeveloped countries but skill-formation poses a serious problem, as it takes a very long time to educate and train the multitudes in such countries.

4. Lack of Enterprise and Initiative. The Lewis theory is based on the assumption that a capitalist class exists in underdeveloped countries. In fact, the entire process of growth depends on the existence of such a class which has the necessary skill to accumulate capital. In reality, such countries lack capitalists with necessary enterprise and initiative.

5. Multiplier Process does not operate in LDC. Again, the theory assumes that capital accumulation takes place when the capitalist class continues to reinvest profits. It, therefore, presupposes the operation of the "investment multiplier" which is not applicable to underdeveloped countries.[4] For if profits are reduced somehow or the prices of wage goods rise, the process of capital formation will stop before all the surplus labour is absorbed.

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3. Lloyd G. Reynolds, "Wages and Employment in a Labour-Surplus Economy," *A.E.R* .. September, 1956.

4. See Chapter on "*Keynesian Theory of Development* ."

6. One sided Theory. This is a one-sided theory because Lewis does not consider the possibility of progress in the agricultural sector. As the industrial

sector develops with the transfer of surplus labour, the demand for food and raw materials will rise which will, in turn, lead to the growth of the agricultural sector.

7. Neglects Total Demand. Lewis does not study the problem of aggregate demand. He assumes that whatever is produced in the capitalist sector is either consumed by itself or is exported. He does not even analyse the possibility of the capitalist sector selling its products to the subsistence sector. In case, it so happens, the growth process may come to a halt much earlier through unfavourable terms of trade or the subsistence sector adopting new techniques of production to meet the expanding raw material demand of the capitalist sector.

8. Mobility of Labour not so Easy. Higher capitalist wage will not lead to the movement of surplus labour from the subsistence sector to the capitalist sector. People are so intensely attached to their family and land that they do not like to leave their kith and kin. Moreover, differences in language and custom, the problems of congestion, housing and high cost of living in the capitalist sector stand in the way of mobility of labour to this sector. This is the main weakness of the theory.

9. Marginal Productivity of Labour not Zero. Schultz does not agree that the marginal productivity of labour in overpopulated underdeveloped countries is zero or negligible. If it were so, the subsistence wage would also be zero. The fact is that every worker receives the subsistence wage, may be in kind, if not in cash. It is, therefore, difficult to find out the exact number of surplus labourers who are to move to the capitalist sector, their number hardly exceeding 5 per cent, as is now generally accepted.

10. Productivity falls with Migration of Labour from the Subsistence Sector. Lewis assumes that when the surplus labour is withdrawn from the subsistence sector to the capitalist sector, the agricultural production remains unaffected in the subsistence sector. But the fact is that withdrawal of workers from the farms will reduce output. As pointed out by Schultz, “there is no evidence for any poor country anywhere that would suggest that a transfer of even some fraction, say *5* per cent of the existing labour-force out of agriculture, with other things being equal, could be made without reducing its production.”

11. Low Income Groups also Save. It is not correct to say that only 10 per cent of the people with the largest income save. In fact, people, with low incomes also save due to social reasons and even small farmers save for capital accumulation in underdeveloped countries, whereas high income groups save less because they spend more under the influence of the demonstration effect.

12. Inflation, not Self-Destructive. Lewis's view that inflation for the purpose of capital formation is self-destructive is difficult to believe in the face of acute shortage of consumer goods. Production of consumer goods fails to increase rapidly due to structural rigidities. On the other hand, the marginal propensity to consume of the people is near unity, so that all increases in income lead to inflationary rise in prices.

13. Inefficient Tax Administration. Lewis's contention that taxation will mop up increasing income cannot be accepted because the tax administration in underdeveloped countries is not so efficient and developed as to collect taxes sufficient enough for capital accumulation.

Conclusion. Despite these limitations, the Lewis theory has the merit of explaining in a very clear cut way the process of development. This two sector theory has great analytical value. It explains how low capital formation takes place in underdeveloped countries which have plethora of labour and scarcity of capital. His study of the problems of credit inflation, population growth, technological progress, and international trade gives the theory a touch of realism.

CHAPTER

Fei-Ranis Theory

INTRODUCTION

John Fei and Gustav Ranis in an article entitled "*A Theory of Economic Development* " analyse "the transition process through which an underdeveloped economy hopes to move from a condition of stagnation to one of self-sustained growth." Their theory is an improvement over Lewis's theory of Unlimited Supplies of Labour because Lewis failed to present a satisfactory analysis of the growth of agricultural sector. The analysis that follows is based on the original article and the subsequent modifications[1] made by the authors in their theory of the development of a dual economy.

THE THEORY

The theory relates to an underdeveloped labour-surplus and resource-poor economy in which the vast majority of the population is engaged in agriculture amidst widespread unemployment and high rates of population growth. The agrarian economy is stagnant, people are engaged in traditional agricultural pursuits. Non-agricultural pursuits exist but they are characterised by a modest use of capital. There is also an active and dynamic industrial sector. Development consists of the re-allocation of surplus agricultural workers, whose contribution to output is zero or negligible, to the industrial sector where they become productive at a wage equal to the institutional wage inagriculture.[2]

1. John G.H. Fei and Gustav Ranis, "A Theory of Economic Development," *AER* , Vol. 51, September 1961; *Development of Labour Surplus Economy*, 1964; and "Agrarianism, Dualism and Economic Development," in *The Theory and Design of Economic Development* (eds.) I. Adelman and F. Thorbecke, 1966.

ASSUMPTIONS

In presenting their theory of economic development, Fei and Ranis make the following assumptions:

1. There is a dual economy divided into a traditional and stagnant agricultural sector and an active industrial sector.

2. The output of the agricultural sector is a function of land and labour alone.

3. There is no accumulation of capital in agriculture except in the form of land reclamation.

4. Land is fixed in supply.

5. Agricultural activity is characterised by constant returns to scale with labour as a variable factor.

6. It is assumed that the marginal productivity of labour becomes zero at some point. If population exceeds the quantity at which the marginal productivity of labour becomes zero, labour can be transferred to the industrial sector without loss in agricultural output.

7. The output of the industrial sector is a function of capital and labour alone. Land has no role as a factor of production.

8. Population growth is taken as an exogenous phenomenon.

9. The real wage in the industrial sector remains fixed and is equal to the initial level of real income in the agricultural sector. They call it the institutional wage.

10. Workers in either sector consume only agricultural products.

Given these assumptions, Fei and Ranis analyse the development of a labour-surplus economy into three phases. In the first phase, the disguised unemployed workers, who are not adding to agricultural output, are transferred to the industrial sector at the constant institutional wage. In the second phase, agricultural workers add to agricultural output but produce less than the institutional wage they get. Such workers are also shifted to the industrial

sector. If the migration of workers to the industrial sector continues, a point is eventually reached when farm workers produce output equal to the institutional wage. This begins the third phase which marks the end of the take-off and the beginning of the self-sustained growth when farm workers produce more than the institutional wage they get. In **this** phase, the surplus labour is exhausted and the agricultural sector becomes commercialised.

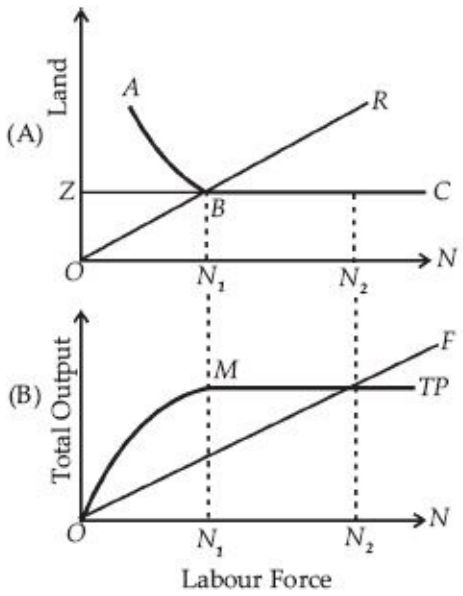

Fig. 1.

2. Before starting this model, students should first read the Lewis Model in the previous chapter.

Fig. 1 (A) shows the functioning of the agricultural sector where agricultural goods are produced by the application of labour (*L*) and land (*Z*). Labour is measured on the horizontal axis and land on the vertical axis. The ray *OR* shows the stage of production. The curve *ABC* is the production contour of agricultural goods. Assuming land to be fixed at *OZ*, labour ON_1 produces the maximum output. The total productivity of labour is represented by *TP* curve in Fig. 1 (B). If more labour is employed beyond N_1 with land *OZ*, production would not increase. This is because the total productivity of labour becomes constant beyond point *M* on the *TP* curve. Assuming thatON_2 is the total labour force, engaged in agriculture ON_1 is the non-redundant labour and N_1N_2 is the redundant labour force. N_1N_2 number of workers do not make any positive contribution to output and their marginal physical productivity approaches zero beyond point *M* on the *TP* cruve. Such workers are disguised unemployed.

Economic development takes place when these workers are shifted from the agricultural sector to the industrial sector in three phases. This is illustrated in Fig. 2(A), (B) and (C) where Panel *(A)* depicts the industrial sector and panels (*B*) and (*C*) the agricultural sector.

Let us take Panel (C) where the labour force in the agricultural sector is

measured from right to left on the horizontal axis *ON* and agricultural output downward from *O* on the vertical axis *OY.* The curve *OCX* is the total physical productivity curve (TPP)[3] of the agricultural sector. The horizontal portion *CX* of the curve shows that the total productivity is constant in this region so that the marginal productivity of *MN* labour is zero. Thus *MN* labour is surplus and its withdrawal to the industrial sector will not affect agricultural output. If, however, it is presumed that the entire labour force *ON* is engaged in the agricultural sector, it produces *NX* total agricultural output. Assuming that the entire output *NX* is consumed by the total labour force *ON* , the real wage is equal to *NX* /*ON* or the slope of the ray OX. This is the institutional wage.

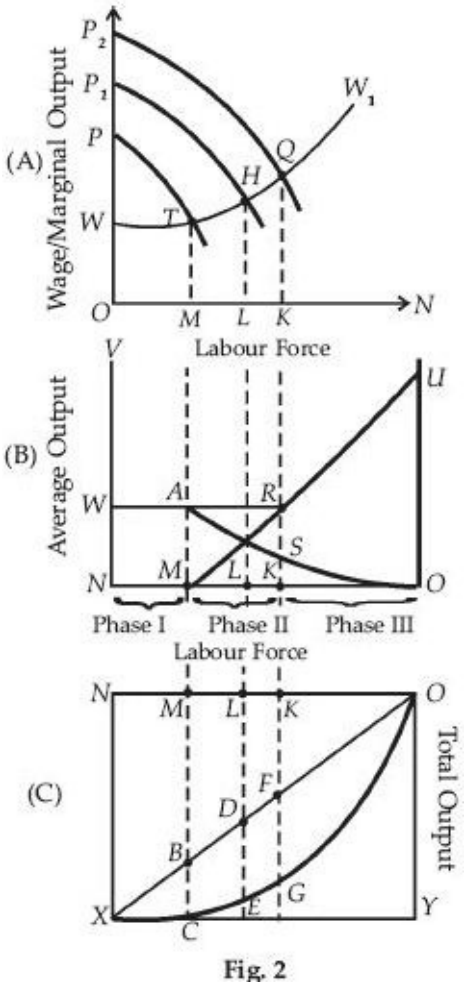

Fig. 2

The allocation process in three phases during the take-off is depicted in Panel (B) of the Fig. 2 where the total labour force is measured from right to left on the horizontal axis *ON* and the average output on the vertical axis *NV.* The curve *NMRU* represents the marginal physical productivity of labour (MPP) in the agricultural sector. *NW* is the institutional wage at which the workers are employed in this sector.

3.It is the inverted *OTP* curve Fig. 1(B)

In Phase I, *NM* workers are disguised unemployed. Their marginal physical productivity is zero, as shown by *NM* portion of the *MPP* curve in Panel (B) or *CX* portion of the *TPP* curve of Panel (C). This redundant labour force *NM* is transferred to the industrial sector shown as *OM* in Panel *(A)* at the same institutional wage *OW* (=*NW*).

In Phase II, the MPP of agricultural workers *MK* is positive in the range *MR* on the MPP curve *NMRU* but is less than the institutional wage *KR(=NW)* they get, as shown in Panel (B). So they are also disguised unemployed to some extent

and are shifted to the industrial sector. But the nominal wage in the industrial sector will not equal the institutional wage in this phase. This is because agricultural output declines with the transfer of labour to the industrial sector. As a result, there is a shortage of agricultural commodities leading to rise in their prices relative to industrial goods. This leads to the worsening of the terms for the industrial sector, thereby requiring a rise in the nominal wage in the industrial sector. The nominal wage rises above the institutional wage *OW to LH* and *KQ.* This is shown by the upward movement of the supply curve of labour from *WT* to *H* and Q, as *ML* and *LK* labour gradually shifts to the industrial sector in Panel *(A)*. The movement on the supply curve of labour *WTW* ţfrom *T* upward is "the Lewis turning point."

When Phase III begins, agricultural workers start producing agricultural output equal to the institutional wage and ultimately more than the institutional wage they get. This marks the end of the take-off and the beginning of the self-sustained growth. This is shown by the rising portion *RU of* the MPP curve in Panel (B) which is higher than the institutional wage *KR(=NW)*. Consequently, *KO* of labour will be shifted from the agricultural sector to the industrial sector at a rising nominal wage above *KQ* in Panel (A) of the figure. This leads to the exhaustion of the surplus labour in the agricultural sector which becomes fully commercialised. According to Fei and Ranis, "The 'exhaustion of the labour surplus' must be interpreted primarily as a market phenomenon rather than as a physical shortage of manpower, it is indicated by an increase in the real wage at the source of supply."

Fei and Ranis point out that as agricultural workers are shifted to the industrial sector, there begins a surplus of agricultural commodities. This leads to the total agricultural surplus (or TAS) in the agricultural sector. The excess portion of total agricultural output over the consumption requirement of the agricultural labour force at the institutional wage is the TAS. The amount of TAS is a function of the number of workers shifted to the industrial sector in each phase of the development process. The TAS is measured in Panel *(C)* of the figure by the vertical distance between the line *OX* and the *TPP* curve *OCX*. In Phase I when *NM* labour is transferred, the TAS is *BC*. In phase II, as *ML* and *LK* workers are shifted to the industrial sector, *DE* and *FG* amounts of TAS arise. "TAS may be viewed as agricultural resources released to the market through the reallocation of agricultural workers. Such resources can be

shiphoned off by means of the investment activities of the landlord class and/or government tax policy and can be utilised in support of the new industrial arrivals."

There is also the average agricultural surplus (or AAS). The AAS is the total agricultural surplus available per head to workers allocated to the industrial sector. It is as if each allocated worker carries his own subsistence bundle along with him. The *AAS* curve is depicted as *WASO* curve in Panel (B) of the figure. In Phase I, the AAS curve coincides with the institutional wage curve *WA.* In Phase II, when *MK* workers are transferred to the industrial sector, the *AAS* begins to fall from *A* to *S* in Panel (B) while *TAS* is still rising from *BC* to *DE* to *FG* in Panel (C).

In Phase III, AAS declines more rapidly from *S* to *O* in Panel (B) and *TAS* also declines as shown by the narrowing of the area from *FG* toward *O* in Panel (C) below Phase III of Panel (B). The decline in both AAS and TAS is due to the rise in MPP of agricultural workers by more than the institutional wage which ultimately leads to the transfer of the remaining surplus labour to the industrial sector.

Fei and Ranis call the boundary between Phase I and II as the "shortage point" when shortages of agricultural goods begin as indicated by the fall of the AAS (the portion *AS* of *WASO* curve) below the minimum institutional wage *(NW)*. And the boundary between phase II and III as the "commercialisation point" which signifies the beginning of equality between MPP and the institutional wage in agriculture. Thus the Lewis turning point coincides with the shortage point of Fei and Ranis, and the increase in the industrial wage is speeded up at the commmercialisation point.

They show that if agricultural productivity is increasing, the shortage point and the commercialisation point coincide. This is because with the increase in agricultural productivity the rise in MPP enables the output to rise to the level of the institutional wage more quickly. It may be viewed as the shifting of MRU curve upward to the left in Fig. 2(B). On the other hand, the AAS increases with the increase in total physical productivity This means that the *ASO* curve in Fig. 2(B) shifts upward to the right. If the rise in productivity is sufficient, the *MRU* and *ASO* curves in Fig. 2(B) will so shift upward that the shortage point *A* and the commercialisation point *R* coincide and Phase II is eliminated. So far as the

industrial sector is concerned, the increase in agricultural productivity has the effect of raising the industrial supply curve after the turning point. This can be viewed as the shifting of the WTW_1 curve downward to the right below point *T* in Fig. 2(A).

According to Fei and Ranis, "The economic significance of the equality between our turning point and the commercialisation point is that, after the turning point, the industrial supply curve of labour finally rises as we enter a world in which the agricultural sector is no longer dominated by non-market institutional forces but assumes the characteristics of a commercialised capitalist system." In other words, the economic significance of the elimination of the second phase is that it enables the economy to move smoothly into self-sustained growth.

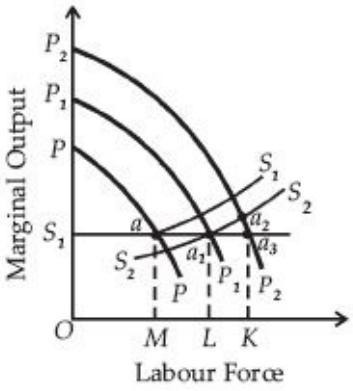

Fig. 3

Balanced Growth. Fei and Ranis have further shown that their model satisfies the conditions of balanced growth during the take-off process. Balanced growth requires simultaneous investment in both the agricultural and industrial sectors of the economy. This is illustrated in Fig. 3 where *PP* is the initial demand curve for labour and S_1S_1 the initial supply curve of labour. They intersect at *a* where *OM* labour force is employed in the industrial sector. At this level of employment, the industrial sector is getting a profit equal to the area S_1Pa. This profit is the total investment fund available to the economy during the take off process. A part of this fund is allocated to the agricultural sector thereby raising agricultural productivity and shifting the supply curve of labour in the industrial sector downward to the right from S_1S_1 to S_2S_2. The remaining part of the investment fund is allocated to the industrial sector, thereby shifting the industrial demand curve upward to the right, from *PP* to P_1P_1. The $S_2S_2$and P_1P_1curves intersect at a_1 lying on the balanced growth path S_1a_3. At $a_1$the industrial sector absorbs *ML* labour force which has been released by the agricultural sector as a result of rise in agricultural productivity following the allocation of investment fund to it. In Fig. 3, *ML* labour force absorbed in the industrial sector exactly equals the labour force *ML* released from the agricultural sector in Fig. 2(B).

Thus as investment funds are continued to be allocated to both sectors through time, the economy will move on the balanced growth path. But there is every likelihood for the actual growth path to deviate from the balanced-growth path from time to time. "Such a deviation, however, will call into play countervailing equilibrating forces which tend to bring it back to the balanced-growth path. The actual path is, in fact, likely to be oscillating around the balanced-growth path." For example, if as a result of overinvestment in the industrial sector, the demand curve for labour shifts to P_2P_2 and intersects the supply curve of labour 8_28_2 at a $_2$, the actual growth path will be above the balanced-growth path. This will lead to shortage of agricultural goods, to deterioration of the terms of trade of the industrial sector and to rise in the wage rate in this sector. This will discourage investment in the industrial sector and encourage investment in the agricultural sector and thereby bring the actual path to the level of the balanced-growth path a_3.

A CRITICAL APPRAISAL

The Fei-Ranis model is an improvement over the Lewis model. The Lewis model ignores the development of agricultural sector and concentrates exclusively on the industrial sector. The Fei-Ranis model shows the interaction between the two sectors in initiating and accelerating development. Moreover, its explanation of the Lewis turning point is more realistic. But the major merit of the theory is that it shows the importance of agricultural products in capital accumulation in underdeveloped countries.

Despite these merits, the model is not free from criticism which are discussed below:

1. Supply of Land not Fixed. Fei and Ranis begin with the assumption that the supply of land is fixed during the development process. In the long run, the amount of land is not fixed, as the statistics of crop acreage in many Asian countries reveal. For instance, the index number of area under crops (base 1961-62) in India rose from 82 in 1950-51 to 107.3 in 1970-71.

2. Institutional Wage not above the MPP. The model is based on the assumption of a constant institutional wage which is above the MPP during phases I and II of the development process. There is no empirical evidence to

support this assumption. In fact, in labour surplus underdeveloped countries, wages paid to the agricultural workers are much below their MPP.

3. Institutional Wage not Constant in the Agricultural Sector. The theory assumes that the institutional wage remains constant in the first two phases even when agricultural productivity increases. This is highly unrealistic because with a general rise in agricultural productivity, farm wages also tend to rise. For instance, the daily real wage rates (at 1966 prices) of agricultural workers for various farm operations in Punjab during the period of the green revolution (1967-72) increased by 41.7 per cent to 55.2 per cent.[4]

4. Closed Model. According Fei and Ranis, the terms of trade move against the industrial sector in the second phase when agricultural output declines and prices of agricultural commodities rise. This analysis is based on the assumption of a closed economy where foreign trade does not exist. But this assumption is unrealistic because underdeveloped countries are not close but open economies which import agricultural commodities when shortages arise.

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4. M.L. Jhingan, "Surpluses Pertaining since the Green Revolution and their contriubution to Industrialisation —A Study of Punjab," *IJAE.*, Conference Number, July-September, 1979.

5. Commercialisation of Agriculture Leads to Inflation. According to the theory, when the agricultural sector enters the third phase, it becomes commercialised. But the economy is not likely to move smoothly into self-sustained growth because inflationary pressures will start. When many workers shift to the industrial sector, the agricultural sector will experience shortage of labour. In the meantime, the institutional wage also equals the MPP of workers and the shortages of agricultural products arise. All these factors will tend to create inflationary pressures within the economy.

6. MPP not Zero. Fei and Ranis observe that "with a fixed amount of land, there will be some size of population which is large enough to render MPP zero." But Schultz does not agree that in labour-surplus economies the MPP is zero. According to him, if it were so, the institutional wage would also be zero. The fact is that every worker receives a minimum wage, may be in kind, if not in cash. Thus it is wrong to say that the MPP is zero in the agricultural sector.

Conclusion. However, these limitations do not undermine the importance of

the Fei-Ranis model for the economic development of labour-surplus countries. It systematically analysis the development process from the take-off to self-sustained growth, through the interaction of the agricultural and industrial sectors of an underdeveloped economy.

CHAPTER

Jorgenson's Neo-Classical Model of a Dual Economy

The JORGENSON MODEL

Prof. D. W. Jorgenson[1] has presented a theory of development of a dual economy. He divides the economy into two sectors—the modern or manufacturing (industrial) sector, and the traditional or agricultural sector. There is asymmetry in the production relations in the two sectors. The agricultural sector is a function of land and labour alone; and the manufacturing sector of capital and labour alone. Population growth depends on the supply of food per capita only. If the food supply is more than sufficient for the population, there exists an agricultural surplus and labour is free from the land for employment in the manufacturing sector. If there is no agricultural surplus, all labour remains on the land. On the other hand, if an agricultural surplus exists, the labour force migrates from the agricultural sector to the manufacturing sector for employment. But the labour force available for employment in the manufacturing sector grows at a rate which is equal to the growth rate of the agricultural surplus. Due to a steady migration of labour from the backward agricultural sector to the modern sector, labour may demand higher wages in the latter sector. Therefore, there may be some wage differential in the two sectors. This differential is proportional to the manufacturing wage rate and is stable in the long run. This differential determines the terms of trade between manufacturing and agricultural sectors, and thereby the rate of investment in the manufacturing sector of a closed economy.

1. D. Jorgenson, The Development of a Dual Economy, *E.J. 71,* 1961 and Surplus Agricultural Labour and the Development of a Dual Economy. *O.E.P.,* 19, 1967.

However, the decline of the economy to its trap level of output can also be

traced with the diminution of the agricultural surplus. As the agricultural surplus begins to diminish, the agricultural labour force grows at a rate which is more rapid than the growth rate of population. The labour force declines absolutely in the manufacturing sector and returns to the agricultural sector. The output in the manufacturing sector drops to zero and capital is decumulated at the rate given by the rate of depreciation. Ultimately, the process of capital accumulation comes to a halt. Food output per capita declines to a stationary level and population growth is reduced from its maximum rate. This is a low level equilibrium trap situation.

Assumptions of the Model

The Jorgenson model is based on the following assumptions:

1. The economy consists of two sectors — the agricultural sector and the manufacturing sector.

2. The output of the agricultural sector is a function of land and labour.

3. All land is fixed in supply.

4. The output of the manufacturing sector is a function of capital and labour.

5. Agricultural activity is subject to the law of diminishing returns to scale.

6. The manufacturing activity is subject to the law of constant returns to scale.

7. Technical changes take place at some constant rate and all changes are neutral.

8. It assumes a closed economy in which trade is in balance for goods of both sectors.

Agricultural Sector. First we start with the agricultural sector characterised by constant returns to scale with all factors variable as given by the Cobb-Douglas production function:

$$Y = e^{\alpha t} L^{\beta} P^{1-\beta} \qquad \ldots(1)$$

where, Y represents agricultural output; $e^{\alpha t}$ is technical change which takes place at a constant rate (α) in the time (t); L is fixed quantity of land available in the economy; β is the share of landlords in the product which takes the form of rent; P is total population in this sector; and 1-β is the share of labour in the product paid.

Since the supply of land *(L)* is fixed, equation (1) can be written as

$$Y = e^{\alpha t} P^{1-\beta} \qquad \text{.....(2)}$$

To obtain agricultural output per man, we divide both sides of the above equation (2) by *P*, and we have,

$$\frac{Y}{P} e^{\alpha t} P^{1-\beta}$$

or $$y = e^{\alpha t} P^{1-\beta} \qquad \left[\because \frac{Y}{P} = y\right]$$

Now differentiating with respect to time,

$$\dot{y} = \alpha e^{\alpha t} P^{-\beta} + e^{\alpha t}(-\beta) P^{-\beta-1} \dot{P}$$

$$= e^{\alpha t} P^{-\beta} \left[\alpha - \frac{\beta}{P} \dot{P}\right. \qquad \left[\because P^{-1} = \frac{1}{P}\right.$$

$$= y \left[\alpha - \beta \frac{\dot{P}}{P}\right. \qquad \left[\because y = e^{\alpha t} P^{-\beta}\right]$$

or $$\frac{\dot{y}}{y} = \alpha - \beta \varepsilon \qquad \text{....(3)} \qquad \left[\because \varepsilon \frac{\dot{P}}{P}\right.$$

where, α is the rate of technical progress, β is the share of landlords in the product and ε is the net reproduction rate of population.

According to Jorgenson, depending on the conditions of production and the net reproduction rate, the agricultural sector is characterised either by a low level equilibrium trap in which output of food per head is constant and population and food supply are growing at the same positive rate (α-βε), or by a steady growth equilibrium in which output per head is rising and population

is growing at its physiological maximum rate. The necessary and sufficient condition for a positive growth of output in the agricultural sector is $\alpha - \beta \varepsilon > 0$.

Its Policy Implications. The policy implications of the above analysis are that a backward agricultural economy can change its system by altering the parameters of its system. If the economy is in a low level equilibrium trap and β remains constant, it can come out of the trap situation by increasing the rate of technical change (α) so that the sign of the expression $\alpha - \beta \varepsilon$ is changed from negative to positive, and there is a steady increase in the output of food per head. Or the reproduction rate of population *(ε) may be reduced by birth control measures. So long as the rate of technical progress (α) is greater than the reproduction rate (ε), the growth of food output per head will take place. If they are equal ($\alpha = \varepsilon$)*, the system will be in low level equilibrium trap.

Agricultural Surplus. It is only when food output per head is constantly rising, an agricultural surplus is generated. Jorgenson explains the agricultural surplus per member of the agricultural labour force as

$$y - y^{+} = s$$

where, y is the agricultural output per man, y^{+} is the level of output of food at which the net reproduction rate of population is the maximum, and s is the agricultural surplus.

If total agricultural output exceeds this rate, part of the labour force may be freed from the land to the manufacturing sector to produce goods with no decrease in the growth rate of the total labour force. If we denote the agricultural population by A and the manufacturing population by M, then the total population will be $P=A+M$. Where $A=P$, the whole labour force is engaged in agricultural production.

According to Jorgenson, in a dual economy, labour may be freed from the land at a rate which is just sufficient to absorb the agricultural surplus. But if the growth of manufacturing is not sufficiently rapid, some of the excess labour force will remain on the land and part or all of the surplus may be consumed in the form of increased leisure by the agricultural workers and there will be virtual destruction of the manufacturing activity. However, this

dual economy model assumes a balance between the expansion of manufacturing labour force and the production of food which is described as

$$\frac{y^{+}}{y} = \frac{A}{P}$$

This relationship holds only when an agricultural surplus exists. In other words, when there is a positive agricultural surplus rather than a shortage of food, and $y > y^{+}$.

Manufacturing Sector. Now we take the conditions of production and capital accumulation in the manufacturing sector. The production function for the manufacturing sector is based on the assumption of constant returns to scale and is in the form:

$$X = f(K, M, t) \qquad \text{.....(4)}$$

where, *X is* the manufacturing output, *K* is the capital stock, *M* is the manufacturing labour force, and *t* is time.

If the relative share of labour in manufacturing output is constant and all technical change is neutral, then the production function becomes

$$X = A(t)\, K^{\sigma} M^{1-\sigma} \qquad \text{...(5)}$$

where, *A(t)* is some function of time and 1—σ is the relative share of labour force *(M).*

If the rate of growth is constant, then

$$\frac{\dot{A}}{A} = \lambda$$

or

$$\dot{A} = \lambda A$$

By solving this as a differential equation, we have

$$A(t) = e^{\lambda t} A(O)$$

Substituting the value of *A(t)* in equation (5), we have

$$X = e^{\lambda t} A\,[O]\; K^{\sigma} M^{1-\sigma} \qquad \ldots(6)$$

Dividing *X* and *K* by *M,* and representing output per man by *x* and *k* respectively, and changing the units of *X* so that *A(O)*—1, the production function becomes

$$x = e^{\lambda t} k^{\sigma}$$

This is a technical progress function which expresses output per man as a function of capital per man.

Rate of Capital Accumulation. Next Jorgenson studies the determination of the rate of capital accumulation. According to him, the first approach is through the fundamental *ex post* identity between the sum of investment and the consumption of manufactured goods, on the one hand, and manufacturing output, on the other. He assumes with Kaldor that industrial workers do not save and property owners do not consume out of their property income. Then, the consumption of manufactured goods, in both the manufacturing and agricultural sectors, is equal to the share of labour in the product of the manufacturing sector. The industrial wage rate is determined by the marginal producitvity condition:

$$\frac{\partial M}{\partial X} = (1-\sigma)x = w$$

where, *x is* output per man, 1—α is the relative share of labour in the total product, and *w* is the industrial wage rate. The necessary condition for the maximisation of profits is that the industrial wage rate should be equal to the marginal product of labour. It is assumed that profits are maximised in the manufacturing sector and not in the agricultural sector. The agricultural workers can be expected to respond to wage differentials between industry and agriculture only if industrial wages are greater than agricultural income. Itis, therefore, assumed that the differential which is necessary to cause movement of agricultural labour into the industrial sector is roughly proportional to the industrial wage rate.

$$wM + \mu\, wA = (1-\sigma)\, X + qY$$

where, *wM* is the industrial wage bill, *μ wA* is total agricultral income expressed in manufactured goods, (1—σ) *X* is total consumption of manufactured goods by workers in both sectors, and *qY* is the value of agricultural output measured in manufactured goods. The variable *q* is the terms of trade between agriculture and industry. It is assumed that all agricultural income, whether in the form of rent or wages, is consumed. So investment in the manufacturing sector is financed entirely out of the incomes of property-holders in that sector.

Jorgenson points out that once the share of labour in industrial output is distributed to workers in the form of food and consumption goods, and agricultural workers have received the proportion of industrial output which must be traded for food, the remainder of industrial output is available for capital accumulation or investment. He defines capital accumulation as investment less depreciation, and depreciation is regarded as a constant fraction of capital stock:

$$\dot{K} = I - \eta K$$
$$I = \dot{K} - \eta K \qquad \ldots(5)$$

where, η is the rate of depreciation, *I* is investment, and *K* is net capital accumulation.

The total industrial output is equal to consumption plus investment:

$$X=(1-\sigma)\,X - I \qquad \ldots(9)$$

where, *X* is the total industrial output, (1–σ*) X is* its consumption and *I* is investment.

This equation implies the following relation between output and capital stock By substituting equation (8) in equation (9), we have

$$X = (1-\sigma)\,X - \dot{K} - \eta K$$
or $$X = X - \sigma X - \dot{K} - \eta K$$
or $$X = \dot{K} - \eta K \qquad \ldots(10)$$

In the above equation (10),σ *X* represents saving, while investment is made up of two components: one, net capital accumulation, $\dot{K}$ and two, replacement investment η*K.*

By using the production function $X = e^{\lambda t} K^{\sigma} M^{1-\sigma}$ to eliminate *X*, the level of output in the manufacturing sector in the above equation (10), we have

$$+ \eta K = \sigma e^{\lambda t} K^{\sigma} M^{1-\sigma}$$

which is the fundamental equation for the development of a dual economy.

CONCLUSION

A backward traditional economy grows when there is a positive and growing agricultural surplus and capital accumulation. Once the economy starts growing, it continues to grow. The actual pattern of growth is determined by two fixed initial conditions: *first*, the size of the total population at the time when sustained growth begins; and *secon*d, the size of the initial capital stock. Of these, only the influence of the initial capital stock dies out quickly. The greater the rate of depreciation and the greater the relative share of labour (1–σ), the more rapidly the effects of the initial capital endowment disappear. Further, there is no critical level of initial capital endowment below which no sustained growth is possible. Even the smallest initial capital stock gives rise to sustained growth. In other words, the combination of a positive and growing agricultural surplus and a small positive initial capital endowment gives rise to take-off into self-sustained capital accumulation and increase in output. For long run equilibrium growth, capital and output grow at the same rate, even when there is neutral technical progress. When there is technical progress, population grows at its maximum rate, and capital and output grow at a more rapid rate, i.e., $\lambda/(1-\sigma) + \varepsilon$, where λ is the rate of technical progress and (1–σ) is the share of labour. The rate $\lambda/(1-\sigma) + \varepsilon$ is like Harrod's natural growth rate *Gn*.

Finally, the condition which is necessary and sufficient for sustained growth of output in both the agricultural and manufacturing sectors is $\alpha - \beta\varepsilon > O$, where α is the rate of technical progress, ε is the maximum rate of population growth and 1-β is the share of labour in the product. Thus the development of a dual economy depends not only on the existence of an agricultural surplus in the agricultural sector but also on technical conditions in the manufacturing sector. The more rapid the rate of technical progress, the higher the saving ratio, and the more rapid the rate of population growth, the more rapid is the pace of

growth in the industrial sector. Ultimately, the industrial sector develops more, dominates in the economy, and becomes more and more like the advanced economic system described by the Harrod-Domar growth theory.

Another feature of Jorgenson's dual economy model which characterises long run equilibrium is the absence of a 'critical minimum effort' necessary for a take-off into self-sustained growth of the Leibenstein type. Whatever the initial capital endowment of the manufacturing sector, sustained growth must continue. In fact, the beginning of growth of manufacturing output is invariably accompanied by a "big push' of activity with an extraordinary high rate of growth of the output.

A CRITICAL APPRAISAL

Jorgenson expounded a theory of development of a dual economy based on the neo-classical production function, and applicable to the historical situation of Japan and countries of South East Asia. His model is superior to the dualistic models of Boeke, Lewis, Rei-Fanis among others. This is because these models deal with 'special situations' or 'unsolved problems' created by concentration on a single output or a single production relation. On the other hand, his model is more realistic because it takes into consideration population, labour force, capital and technical change in discussing the development of a dual economy. However, he admits that his model does not present the universal theory of economic growth and development but a theory which is applicable to a well defined and empirically significant situation.

Its Weaknesses. However, the Jorgenson model has the following weaknesses:

1. Jorgenson's claim that his model is superior to the classical models of a dual economy, as it is based on the empirical evidence of the Japanese economy, cannot be accepted because he compares the short-run predictions of the classical models with the asymptotic results of bis neo-classical model.

2. Jorgenson rules out the possibility of capital accumulation in agriculture and in support cites the case of the Japanese economy and Asian agriculture. As such, he excludes capital from the production function of the agricultural sector. This is unrealistic because a number of empirical studies, such as by Shukla for India, Nakamura for Japan, and Hansen for Egypt have shown that

the use of capital has made rapid increases in labour productivity and farm production.

3. Another weakness of Jorgenson's model is that he assumes the supply of land as fixed in his agricultural production function. But the supply of land even in a backward agricultural economy can be increased over the long run through land reforms and land reclamation, thereby increasing the area under cultivation. This may result in a larger agricultural surplus.

4. Jorgenson's model is weak in that it emphasises the role of only supply factors such as labour, capital and technical change, and neglects the demand factors which also play an important role in the development of a dual economy.

5. Jorgenson also neglects the important role played by the service sector in the development of agricultural and industrial sectors of a dual economic system.

JORGENSON VS. FEI-RANIS

The Fei-Ranis model divides the process of economic development into three stages. But it differs from Jorgenson's model only with regard to the first stage. Jorgenson skips the first stage of the F-R model and assumes from the beginning of his analysis that the transfer of labour from agriculture to industry will actually result in a decline in the total agricultural output unless offset by an increase in productivity. If agricultural technology is assumed constant, the problem of feeding the labour force in the urban sector and the shortage of capital for non-farm jobs can delay the process of economic transformation.

Jorgenson's argument is more forceful than F-R that the process of capital formation (or accumulation) and economic development cannot proceed smoothly without technological change in the agricultural sector. Only when technological changes raise agricultural productivity to a level where agricultural output is sufficient to feed not only those who remain in agricultural but also the migrating workers from agriculture to industry will the necessary condition for economic transformation be satisfied.

It is common to both the Jorgenson model and the Fei-Ranis model that the process of economic transformation initiated by the withdrawal of surplus labour from agriculture can be disrupted by an alteration in the domestic terms of trade against industry and in favour of agriculture. As John Mellor points out, a change in the domestic terms of trade towards agriculture is likely to have three different effects which may delay or interrupt the process of economic development. *Firs*t, if savings in the agricultural sector are lower than in the non-farm sector, a transfer of resources from the latter to the former because of a change in the domestic terms of trade between the two sectors would slow down the rate of capital fomation. However, it is posible that the rise in agricultural prices, as compared with industrial prices, would encourage the entrepreneurial class to become interested in the modernisation of agriculture, which would lead to large agricultural output and surpluses. *Second*, a relative rise in domestic agricultural prices will no doubt adversely affect the exports of primary products which constitute the bulk of exports of the developing countries. If this happens, it will reduce the country's net foreign exchange earnings and have adverse repercussions on the development of the economy as a whole. *Third*, higher food prices will discourage the migration of farm workers to the urban sector. Higher food prices will also raise the level of normal wages in industry. This will put a downward pressure on profit. Low profit and high wages will retard the process of economic transformation.

CHAPTER

Harris-Todaro Model of Migration and Unemployment

The Harris-Todaro Model

The Harris-Todaro (H-T) model[1] is based on the experiences of tropical Africa facing the problems of rural-urban migration and urban unemployment. The labour migration is due to rural-urban differences in average expected wages. The minimum urban wage is substantially higher than the rural wage. If more employment opportunities are created in the urban sector at the minimum wage, the expected wage shall tend to rise and rural-urban migration shall be induced leading to growing levels of urban unemployment. To remove urban unemployment, Harris and Todaro suggest a subsidised minimum wage through a lumpsum tax.

ASSUMPTIONS OF THE MODEL

The Harris-Todaro model is based on the following assumptions:

1. There are two sectors in the economy; the rural or agricultural sector (A) and the urban or manufacturing sector (M).

2. The rural sector produces X_A units of agricultural goods and the urban sector produces X_M units of manufactured goods. Each sector produces only one unit.

1. J.R. Harris and M.P. Todaro, "Migration, Unemployment and Development: A Two-Sector Analysis," *A.E.R.* , March, 1970.

3.The model operates in the short run.

4. Capital is available in fixed quantities ($\overline{K}$) in the two sectors.

5. There are N workers in economy with N_A and N_M numbers employed in the rural and urban sectors respectively.

6. The number of urban jobs available (N_M) is exogenously fixed. In the rural sector some work is always available. Therefore, the total urban labour force comprises $N–N_A$ alongwith an available supply of rural migrants. In other words, the total urban labour force equals $N–N_A$ with $(N–N_A)–N_M$ unemployed.

7. The urban wage is fixed at W_M and the rural wage at W_A , $W_M > W_A$.

8. The rural wage equals the rural marginal product of labour and the urban wage is exogenously determined.

9. Rural-urban migration continues so long as the expected urban real income is more than the real agricultural income.

10. The expected urban real income is equal to the proportion of urban labour force actually employed multiplied by the fixed minimum urban wage.

11. There is perfect competition among producers in both the sectors.

12. The price of the agricultural goods is determined directly by the relative quantity of the two goods produced in both the sectors.

THE MODEL

Given the above assumptions, Harris and Todaro explain their model mathematically.

Output in the rural sector is supposed to be a function of labour so that the production function for agricultural good is

$$X_A = f(N_A, \overline{L}, \overline{K}_A) \qquad f' > 0; f'' < 0 \qquad \ldots(1)$$

where, X_A , is the output of agricultural goods, N_A is the rural labour units

employed to produce this output, $\bar{L}$ is the fixed given land, and K_A is the fixed quantity of available capital in the rural sector.*f'* is the derivative of *f* with respect to N_A .

Similarly, output in the urban sector is supposed to be a function of labour so that the production function for manufactured good is

$$X_M = f(N_M, \bar{K}_M) \qquad f' > 0; f'' < 0 \qquad \ldots(2)$$

where, X_M is the output of manufactured goods, N_M is the urban labour units employed to produce this output, and $\bar{K}_M$ is the fixed quantity of available capital in the urban *sector f'* is the derivative of *f* with respect to N_M .

The total labour available in the economy is *N.* Therefore,

$$N_A + N_M \leq N \qquad N_A ; N_M \geq 0$$

The price determination equation in the economy is

$$P = p\left(\frac{X_M}{X_A}\right) \qquad p' > 0 \qquad \ldots.(3)$$

where, *P* is the price of agricultural goods in terms of the price of manufactured goods which is a function *(p)* of the relative output of agricultural and manufactured goods.

The agricultural wage equals the value of marginal product (MP) of labour expressed in terms of the manufactured goods,

$$w_A = f'_A(N_A) = P(f'_M) \qquad \ldots.(4)$$

In the urban sector, the producers are wage-takers and they aim at profit-maximisation which means that the urban market wage,

$$w_M = f'M(N_M)$$

However, in this economy, the urban real minimum wage $(\overline{W}_M)$is at a lower level due to institutional or political factors so that

$$w_M = f' \geq \overline{w}_M \qquad \text{.....(5)}$$

This equation expresses that wage in the urban sector is equal to the MP of labour because of the price-taking behaviour of producers. This assumption is called the *wage-rigidity axiom.*

Assuming wage to be flexible, if wages are above $\overline{w}_{M}$, there will be an excess supply of labour in the urban sector and competition among producers will drive w_M to the level of $\overline{w}_M$. Thus the profit maximisation condition becomes

$$\overline{w}_M = f'_M(N_M)$$

The urban expected wage which leads to the migration of workers from the rural to the urban sector is given by

$$w_u^e = \overline{w}_M \bullet \frac{N_M}{N_U}, \quad \frac{N_M}{N_U} \leq 1 \qquad \text{...(6)}$$

where, the expected real wage (w^e_u) in the urban sector is equal to the urban real minimum wage (w_m) adjusted for the proportion of the total urban labour force (N_U) actually employed. When $N_M / N_U = 1$, there is full employment in the urban sector and the expected real wage equals the real minimum wage, i.e. $w_u^e = \overline{w}_M$.

The total labour endowment $(\overline{N})$ in the economy is

$$\overline{N} = \overline{N}_A + \overline{N}_U = N_A + N_U \qquad \text{...(7)}$$

This equation shows that there is a labour constraint in the economy in the form of workers actually employed in the rural sector (N_A) plus the total urban labour force (N_M) with equals the initial endowment of rural labour (N_A) *plus* permanent urban labour $(\overline{N}_U)$which, in turn, equals the total labour endowment $(\overline{N})$.

The equilibrium condition is given by the equity equation

$$w_A = w_u^e \qquad \text{...(8)}$$

This is based on the hypothesis that migration from the rural to the urban sector is a positive function of urban-rural wage differential. This can be written as

$$\dot{N}_U = f(\overline{w}_M \bullet \frac{N_M}{N_U} Pf') \qquad f' > 0; f(0) = 0 \qquad \ldots(9)$$

where, $\dot{N}_U$ is the time derivative.

This implies that migration from the rural to the urban sector will cease when the expected wage differential is zero, i.e. $w_A = w_u^e$.

This completes the description of an H-T economy. But the above condition does not ensure equilibrium in the entire economy. This requires satisfying equations from (1) to (8). The H-T model contains eight equations and eight unknowns: X_A , X_M , N_A , N_M , w **a** , w^e_u , N $\boldsymbol{U}$ and P. Given the production functions of the rural and urban sectors and the fixed minimum urban wage $w_A = w_u^e$. it is possible to solve for sectoral employment, and the equilibrium unemployment in the urban sector, and consequently the equilibrium expected wage, the relative output level and the terms of trade of the two sectors.

In the H-T model, migration is a disequilibrium phenomenon. Equilibrium is sub-optimal one which is characterised by unemployment. In equilibrium

$$\overline{w}_M \bullet \frac{N_M}{N_U} = Pf'$$

and rural-urban migration ceases.

The H-T model is explained in Fig. 1 where the full employment equilibrium in the economy is represented by the line *RM*. There exists a unique equilibrium on the line $\phi = 0$. Point *F* is the only full employment equilibrium point at which N_A number of workers are employed in the rural sector and N_M in the urban sector. All-points on the line $\phi = 0$ lying above and to the east of *F* are not feasible while points to the left of *F* are associated with a minimum wage higher than the full employment wage. Suppose a minimum wage is set above the full employment level somewhere in the area to the west of *F*. Competition among producers will tend the economy to settle at, say, the

minimum wage point W at which N'_A workers are employed in the rural sector and N'_M in the urban sector. Thus $N_U - N'_M$ workers are unemployed in the urban sector. This minimum wage w gives the minimum loss of unemployment and output in the two sectors and represents *a sub-optimal* situation for the economy. According to Harris and Todaro, this is the rational utility-maximising choice for rural migrants at the minimum urban wage level.

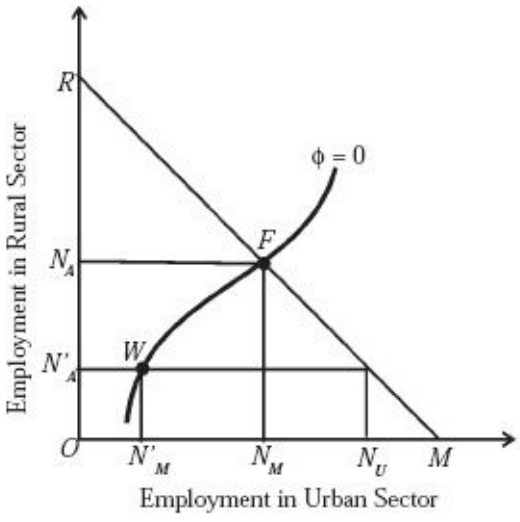

Fig. 1

The above analysis is based on the assumption that the urban minimum wage is fixed in terms of manufactured goods. According to Harris and Todaro, if the urban minimum wage is fixed in terms of agricultural goods, equilibrium is only achievable with unemployment. In this case, the actual minimum wage setting is usually done with reference to some general cost of living index and food is the largest single item in the budget of most urban workers. The equilibrium point can be reached through a simultaneous raising of the price of agricultural good in terms of the manufactured goods, i.e., $P\,(f'_M)$, and the lowering of the expected real wage in the urban sector, i.e., $w^e_{M'}$ As relative agricultural output falls, P (price) will rise. This will lead to a fall in the output of the urban sector because producers shall produce upto the point where the urban market wage w_m equals the urban real minimum wage (f'_M). Thus, according to the H-T model, if the minimum wage is fixed in terms of the agricultural goods, it also gives rise to an equilibrium characterised by unemployment and loss of output of both goods. In terms of Figure 1, such an equilibrium point will be to the west of the corresponding points on the line $\phi = 0$. Thus the principal conclusion remains unaffected even when the minimum wage is fixed in terms of the agricultural goods.

POLICY IMPLICATIONS OF THE H-T MODEL

Harris and Todaro have drawn a few important policy implications of their model. According to them, the payment of minimum wage to the additional

industrial worker will induce more rural-urban migration. To solve the problem of an institutional determined wage that is higher than the equilibrium level, labour should be employed according to a shadow wage and/or at a payroll subsidy wage. Since the opportunity cost (i.e. shadow wage) of an agricultural worker is lower than the marginal product of an industrial worker, the implementation of shadow wage criterion will have important effects on the level of agricultural output and on urban unemployment.

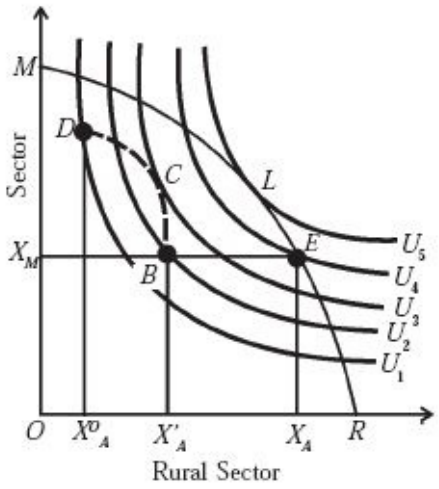

Fig. 2

This is explained in terms of Fig. 2 where *MR* is the production possibility curve of the manufacturing (urban) and rural sectors. Given the minimum wage in the urban sector, the initial equilibrium is at point *B* where OX_M output is produced in the urban sector. The rural-urban migration is not possible to the right of point B due to the expected wage differential. Point E on the production possibility curve is the wage differential point at which OX_M output is produced in the urban sector and OX_A output in the rural sector. But, given the minimum urban wage at point *B,* migration shall reduce agricultural output to OX'_A . According to Harris and Todaro, the shadow wage theory suggests an appropriate wage subsidy to the urban sector so that the economy may move to point *L* on the production possibility curve *MR* where the social indifference curve U_5 is tangent. This is an optimum point being on the higher curve U_5 than point *B* on the curve U_2 . When the shadow wage is implemented in the urban sector, the production of output in this sector will rise. But the creation of an additional job at the minimum wage with subsidy shall induce some additional rural-urban migration thereby leading to a further decline in agricultural output. Thus the movement from *B* can only be in the north-west direction. The dotted curve *BCD* shows the locus of all such employment-output points. But D is the only point at which labour is fully employed with agricultural output being the minimum, OX^0_A. At this point, the expected wage in the urban sector is equal to the minimum urban wage as there is no urban unemployment, and the minimum wage in the rural sector equals the urban minimum wage. Hence rural-urban migration will cease. But point *D* is inside

the production possibility curve *MR* and at a lower level of social welfare curve U_1 . Therefore, this is not an optimal point.

According to Harris and Todaro, "Thus, implementing a shadow wage criterion to the point that urban unemployment is eliminated will not generally be a desirable policy." Instead, the shadow wage policy suggests an appropriate wage subsidy to the urban sector so that the economy may move to point *L* on the production possibility curve *MR* where the social welfare curve U_5 is tangent. But such a point is unattainable. However, the wage subsidy level brings the economy to point *C* where the U_3 curve is tangent to curve *BCD*. This point *C* is preferred to point *B*, as it is on the higher curve U_3 than U_1 .

Harris and Todaro derive the following policy implications from the above analysis:

1. The opportunity cost of labour in the two sectors differs. The creation of an additional job in the urban sector reduces agricultural output through induced migration. On the other hand, additional employment can be generated in the agricultural sector without reducing output in the manufacturing sector.

2. Substituting the minimum wage in the urban sector does not provide optimal employment and output in the urban sector. It reduces unemployment and output in the agricultural sector.

3. The payment of subsidised urban minimum wage to additional workers shall increase total consumption thereby reducing resources available for investment in the economy.

4. Harris and Todaro favour costless lumpsum taxes in order to finance wage subsidy. But this will reduce the amount of job creation in the industrial sector.

ITS CRITICAL APPRAISAL

The Harris-Todaro model has been widely discussed, criticised, empirically tested and modified by Todaro[2], Bhagwati and Srinivasan,[3] Stiglitz,[4] Mazumdar,[5] Basu[6] and many others. We give below a few weaknesses of the

model based on the above studies.

1. The H-T model does not specify alternate policy prescriptions such as giving a wage subsidy to the urban sector and at the same time restricting the migration of those rural workers who are not able to find jobs in the urban sector. Bhagwati and Srinivasan have suggested a uniform wage subsidy to both rural and urban sectors for the economy to attain the optimum level of employment and output.

2. Harris and Todaro suggest non-distortionary lumpsum tax to finance subsidy. But a lumpsum tax is seldom non-distortionary.

3. The H-T model does not take into consideration the generation of savings as a source of financing subsidy. Though savings are low in LDCs, yet they are an important source of non-distortionary finance to subsidise wages.

4. This model does not incorporate the costs of rural-urban migration or the relatively higher costs of urban living which the migrants have to incur in the urban sector.

5. This model fails to take account of the existence of urban 'informal' or unorganised sector. It moves on the supposition that in the urban sector workers either find jobs in the 'formal' or organised industrial sector or they remain unemployed. A series of empirical studies in Asia and Latin America have revealed that the majority of rural migrants find employment in the urban informal sector as petty traders, street hawkers, carpenters, masons, tailors and other trades persons, cooks, taxi drivers, etc. at wages much below the minimum wage in the urban formal sector.

Despite these weaknesses, the H-T model is more realistic than other dual economy models because it tries to tackle the problem of rural-urban migration that actually exists in LDCs. For instance, the Lewis model assumes that there is no unemployment in the urban sector and when rural-urban migration takes place, the number of new jobs created in the urban sector exactly equals the number of migrants. This is highly unrealistic.

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2. M.P. Todaro, *Internal Migration in Developing Countries,* 1976.

3. T.N. Bhagwati and T.N. Srinivasan, ‘On Reanalysing the Harris-Todaro Model: Policy Rankings in the case of sector-specific sticky wages, *A.E.R.* June, 1974.

4. J.E. Stiglitz, ‘Alternative Theories of Wage Determination and Unemployment in LDCs; The labour Turnover Model,’ *Q.J.E.*, 88, 1974.

5. D. Mazumdar,’ The Rural-Urban Wage Gap, Migration and the Shadow Wage,’ *O.E.P.*. Nov., 1976.

6. K. Basu, ‘Optimal Policies in Dual Economics,’ *Q.J.E.*, 95, 1980.

CHAPTER

Leibenstein's Critical Minimum Effort Thesis

LEIBENSTEIN'S THEOR[1]

Harvey Leibenstein has developed the thesis that underdeveloped countries are characterized by the vicious circle of poverty that keeps them around a low per capita income equilibrium state. The way out of this impasse is a certain "critical minimum effort" which would raise the per capita income to a level at which sustained development could be maintained. In order to achieve the transition from the state of backwardness to the more developed state where we can expect steady secular growth, it is a necessity, though not always sufficient condition that at some point or during some period, the economy should receive a stimulus to growth that is greater than a certain critical minimum size.

According to Leibenstein, every economy is subject to "shocks" and "stimulants". A shock has the impact of reducing per capita income initially; while a stimulant tends to increase it. Certain countries are underdeveloped because the magnitude of the stimulants has been small and that of shocks large therein. It is only when the income-raising factors are stimulated much beyond the income-depressing factors that the critical minimum is reached and the economy would be on the path to development.

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1. Harvey Leibenstein, *Economic Backwardness and Economic Growth—Studies in the Theory of Economic Development*, 1957.

Growth Agents. The rationale of the critical minimum effort thesis rests on the existence of certain favourable economic conditions so that the income-increasing forces expand at a rate higher than the income-depressing forces. In the development process such conditions are created by the expansion of the

"growth agents". They are the quantum of capacities residing in the members of the population to carry out growth contributing activities. The typical growth agents are the entrepreneur, the investor, the saver, and the innovator. The growth-contributing activities result in the creation of entrepreneurship, the increase in the stock of knowledge, the expansion of the productive skills of the people and the increase in the rate of saving and investment.

Incentives. According to Leibenstein, ''whether or not the growth agents expand will depend on the anticipated outcome of such activities, the actual result and on the incentives for further expansion or contraction generated by the interaction of the anticipation, the activities and the results." The incentives are of two types:

(i) the zero-sum incentives which do not raise national income but have only a distributive effort;

(ii) the *'positive-sum,* incentives that lead to expansion of national income. It is apparent that only the positive-sum type of activities lead to economic development.

But conditions in underdeveloped countries are such that entrepreneurs are engaged in zero-sum activities. They are the *non-trading* activities for securing a greater monopolistic position, political power and social prestige; the *trading* activities leading to a greater monopolistic position that do not add to aggregate resources; the *speculative* activities which do not utilize savings but do waste scarce entrepreneurial resources; and *finally* , such "activities that do use up net savings, but the investments involved are in enterprises of such nature that their social value is either zero, or their social value is very much lower than their private value. Thus, the zero-sum activities are not real income creating activities but simple transfers of liquidity from some holders to others. On the other side, the positive-sum activities which are essential for economic development have a limited scope in stagnant underdeveloped economies. Even if some entrepreneurs undertake real investment projects in anticipation of profits, their positive-sum activities will degenerate and be directed towards zero-sum activities in the absence of net growth in the economy. It is, therefore, necessary that the minimum effort should be sufficiently large to create an environment congenial to the persistence of positive-sum incentives.

But in underdeveloped economies there are certain influences averse to change that tend to depress per capita incomes. They are:

(*i*) "the zero-sum entrepreneurial activities directed towards the maintenance of existing economic privileges through the inhibition and curtailment of potentially expanding economic opportunities;

(*ii*) the conservative activities of both organized and unorganized labour directed against change;

(iii) the resistance to new knowledge and ideas, and the simultaneous attraction of classical' knowledge and old ideas;

(*iv*) increase in essentially non-productive conspicuous public or private consumption expenditures that use resources that could otherwise be used for capital accumulation; and

(v) population growth and the consequent labour force growth that has the effect, other things being equal, of diluting the amount of capital available per worker," and

(*vi*) a high capital-output ratio.

To overcome these influences which keep the economy in a state of economic backwardness, a sufficiently large critical minimum effort is required to sustain a rapid rate of economic growth which should stimulate the positive-sum incentives and create forces for counteracting zero-sum activities. As a result of the critical minimum effort, the per capita income would rise and tend to increase the level of saving and investment, which in turn, would lead to :

(a) an expansion of the growth agents;

(b) an increase in their contribution to per unit of capital as the capital-output ratio declines;

(*c*) a decrease in the effectiveness of factors inhibiting growth;

(d) the creation of social and environmental conditions that promote social and economic mobility;

(e) increased specialization and expansion of secondary and teritiary sectors; and

(*f*)"the development of an atmosphere that leads to changes is more conducive to economic and social changes, and especially an environment that leads to eventual fertility decline and an eventual decline in the rate of population growth."

Leibenstein's criticial minimum efforts thesis is explained in Fig. 1 where the 45° line measures induced increases and decreases in per capita income which are equal on any point on this line. The curve $x_t x_t$ represents the *per capita income-raising forces* and the curve $z_t z_t$ *the per capita income-depressing forces. E* is the equilibrium point where the two forces are in balance. *If the stimulants raise per capita income from the equilibrium level Oe to Om,* the income-raising forces, generated will raise the per capita income level by *na.* But at this level, the income-depressing forces *,fb* generated by z_t are greater than the income-raising forces generated by x_t . These will, therefore, generate the downard path *abcd,* until it reaches the equilibrium position*E.* It is only when the investment programme raises the per capita income to *Ok* level that the path of sustained growth starts. The income-raising forces generated at *Ok* will raise the income level to *sG* which will, in turn, generate the path of endless expansion of per capita income, as shown by the arrows rising above G. Raising per capita income to *Ok* level and beyond point G is the critical minimum effort case. It should be noted that Leibenstein regards the critical*minimum* efforts as "a *minimum minimorum* of all possible efforts that would lead to sustained real income growth" involving "an optimum time pattern of expenditure or effort."

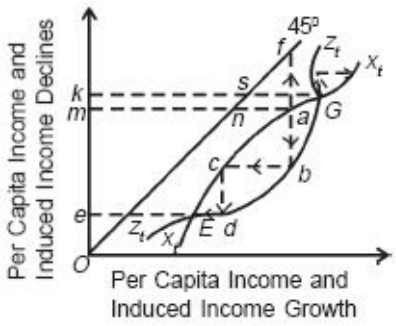

Fig. 1

For sustained development, it is imperative that the initial investment effort must be above a certain minimum level so as to generate a sufficiently large per capita income level in order to overcome autonomous or induced income-depressing forces. But the critical minimum effort need not be made all at once. It would be more effective, if it is broken up into a series of smaller efforts of which the applications to the economy are optimally timed. This is

illustrated in Fig. 2 where the line *ee* represents the low per capita income level and *mm* the critical minimum per capita income level. The gap between the two is divided into Area I and Area II. The Area III above mm is of self-sustained growth. If *Oa* is the per capita income to start with, the initial injection of investment would raise per capita income to *Ob* level. Then at time *t* the second injection of investment would raise per capita income by *cd* so that the critical minimum level *mm* is reached. If investment is not optimally timed, the per capita income would follow the *cy* path of the curve *bcy* toward the low equilibrium level *ee* .

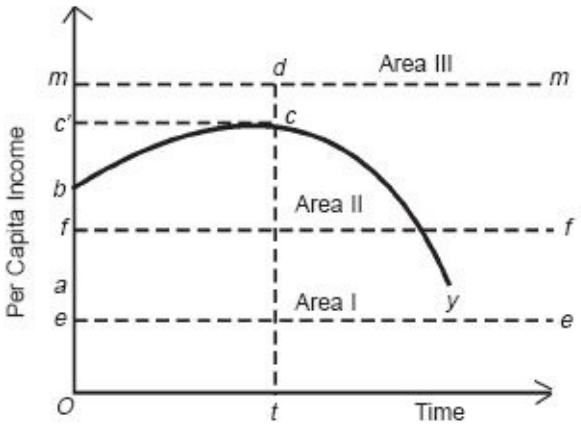

Fig. 2

Population Growth a Function of Per Capita Income. Leibenstein's thesis is, however, based on the empirical evidence that the rate of population growth is a function of the level of per capita income. It is closely related to the different stages of economic development. To start with, at the subsistence equilibrium level of income, fertility and mortality rates are the maximum consistent with *survival* rate of population. If the per capita income is raised above the subsistence equilibrium position, the mortality rate falls without any drop in the fertility rate. The result is an increase in the growth rate of population, Thus, an increase in per capita income tends to raise the growth rate of population. It is only upto a point. Beyond that the increase in per capita income lowers the fertility rate and as development gains. momentum, the rate of population growth declines. The Leibenstein argument is based on Dumont's "Social-capillarity Thesis," which states that with the increase in per capita income, the desire to have more children to supplement perental income declines. Increased specialization following rising income levels and the consequent social and economic mobility make it a difficult and costly affair to rear a large family. Therefore, the growth rate of population becomes constant and then starts declining gradually as the economy advances towards the path of sustained development, as has happened in the case of Japan and Western countries. There is, according to Leibenstein, a biologically determined maximum growth rate of population between 3 and 4 per cent. In order to overcome this population hump, there should be a larger increase in per capita

income. This is discussed with the help of Fig. 3 where the rate of population growth or national income growth is measured along the horizontal axis and level of per capita income on the vertical axis.

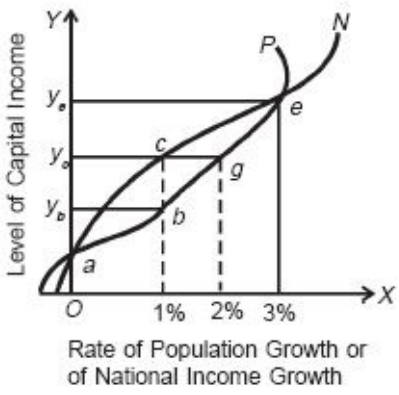

Fig. 3

The curve *N* measures the level of per capita income which generates a level of national income growth equal to the growth rate of population. The curve *P* indicates the rate of population growth at each level of per capita income. Starting from point *a* which represents the subsistence equilibrium point where there is absence of population and income growth, if the per capita income is raised to *Oy* $_{b}$,the population growth rate is 1 per cent while the income growth rate is less than 1 per cent. At the *Oy* $_{c}$ level of per capita income, the rate of population growth is higher than the rate of national income growth, *i.e.*, $y_c g > y_c c$, the former is 2 per cent while the latter is 1 per cent. Therefore, the per capita income level should be so raised as to increase the national income by more than the rate of population growth. This is only possible after *Oy* $_{c}$ level of per capita income whence the rate of population growth starts declining. Point *e* is the 3 per cent maximum biologically determined growth rate of population assumed by Leibenstein. *Oy* $_{e}$ is thus the critical minimum per capita income level which can sustain itself and generate the process of sustained economic development.

Leibenstein's Projections. Leibenstein has also estimated the size of the critical minimum effort in the case of an underdeveloped economy with a starting population of one million. His calculations with regard to fertility and mortality rates are based on life expectancy and *confirm* with those of underdeveloped countries in actuality. He makes several projections based on different assumptions. But we take only projection 4b which appears to apply to those underdeveloped countries which hope to check the growth rate of population as the development process gains momentum and is in keeping with the critical minimum thesis of Leibenstein. With the annual rate of population growth at 2.03 per cent, the capital-output ratio 3:1, the required rate of investment is 13.2 per cent for the first five-year period. In the *25th-30th* years

the population growth rate is the maximum, 2.42 per cent, which requires an investment of 14.5 per cent. Then the population starts declining, and in the *50th-55th* years it is 1.49, thus requiring an investment of 13.08 per cent. The required annual rates of national income growth during these periods is 4.40, 4.84, and 4.36 respectively.

A CRITICAL APPRAISAL

In the preface to his book, Leibenstein writes that his "aim has been explanation and understanding—not *prescription."* But like Rostow's 'take-off stage,' his "critical minimum effort thesis" has caught the imagination of economists and planners in underdeveloped countries and is regarded as a prescription to economic backwardness. The Leibenstein thesis is more realistic than Rosenstein-Rodan's "big push" theory. Giving a big push to the programme of industrialization all at once is impracticable in underdeveloped countries, whereas the critical minimum effort can be properly timed and broken up into a series of smaller efforts to put the economy on the path of sustained development. This theory is also consistent with the idea of democratic planning to which the majority of underdeveloped countries are wedded.

Its Defects . But it has its shortcomings:

1. Population Growth Rate Related to Death Rate. The theory is based on the assumption that the rate of growth of population is an increasing function of the level of per capita income up to a point, but beyond that it is a decreasing function of the latter. But the first process is related to the decline in the mortality rate due to advancements in medical science, and improvement in public health measures in underdeveloped countries, and not to an increase in the level of per capita income. In India, there has been a decline in crude death rate from 24 per thousand in 1960 to 13 in 1982, not due to a rise in the per capita income which is almost stationary but as a result of the above mentioned factors.

2. Decline in Birth Rate not due to Increase in Per Capita Income. Similarly, the decline in the birth rate cannot be attributed to increase in the per capita income at the critical minimum level which surpasses the growth rate of population, as is supposed by Leibenstein. His conclusions are based on the experience of advanced Western countries and Japan. But in underdeveloped

countries the problem of declining birth rate is mostly socio-cultural in nature. What is required is change in 'the attitude, understanding, education, social institutions and even certain intellectual perceptions.' Rise in per capita income alone cannot perform the trick. There is no guarantee that with the decline in the birth rate, population would start decreasing as per capita income increases in underdeveloped countries.

3. Ignores State Efforts to Reduce Birth Rate. Leibenstein ignores the state action in bringing down the fertility rate. As the experience of Japan has shown, no underdeveloped country can afford to wait for per capita income to rise above the critical minimum level so that the birth rate may start declining automatically. In such a situation, she may reach the stage of the population explosion thereby creating more problems than she can solve by rise in the per capita income.

4. Higher than 3 per cent Growth Rate does not Lead to the Take-off. Suppose a country has succeeded in crossing the population barrier of 3 per cent by increasing the growth rate of income above this. According to Leibenstein, when an economy has reached *Ok* level of per capita income in Fig. 1 or *ye* in Fig. 3, it enters the path of endless expansion. Myint questions the correctness of this contention. For it is possible to find cases where abortive '**take-offs** ' take place "in which a country may for a time succeed in raising its saving and investment ratio above 10 per cent to 12 per cent and raising the rate of growth in its total income above 3 per cent level, but subsequently relapses into a slower rate of growth and stagnation."

5. Neglects Time Element. The theory fails to take into account the time element which is required for sustained efforts during which fundamental changes in the institutional and productive structure should be taking place for ensuring a successful take-off. To quote Myint, "We may therefore question how far this type of analysis, originally designed to illustrate the gear shifts in short-run economic activity of fully developed engine of growth in the advanced countries, is useful for the study of the problem of the long-term economic development of the underdeveloped countries which is concerned with the construction of the engine of growth itself."

6. Complex Relation between Per Capita Income and Growth Rate. Again, according to Prof. Myint, the functional relationship between the level of per

capita income and the rate of growth in total income is more complex and not so simple, as has been shown by Leibenstein.

Firstly , the relation of per capita income with the rate of saving and investment depends on the distributional pattern of income and the effectiveness of financial institutions in mobilizing savings.

Secondly , the relation between investment and the resultant output is not determined by a constant capital-output ratio, as is assumed by Leibensten but depends on the extent to which 'the productive organization of the country can be improved and how far land-saving innovations can be adopted to overcome the tendency to diminishing returns on additional investment' even after the growth rate of population has reached the 3 per cent level.

7. Applicable to Closed Economy. The Leibenstein theory does not explicitly explain the influence of foreign capital and other external forces on the levels of income, saving and investment in underdeveloped countries.

CHAPTER

Nelson's Low-Level Equilibrium Trap

NELSON'S THEORY

R. R. Nelson[1] developed the theory of Low-level Equilibrium Trap for underdeveloped countries. Like Leibenstein's Critical Minimum Effort Thesis, Nelson's theory is also based on the Malthusian hypothesis that with the increase in per capita income of a country above the 'minimum subsistence level,' population tends to increase. Initially, population grows rapidly with an increase in per capita income. But when the growth rate of population reaches "an upper physical limit," it starts declining with further increase in per capita income.

According to Nelson, "The malady of underdeveloped economies can be diagnosed as a stable equilibrium level of per capita income at or close to subsistence requirements." At a stable equilibrium level of per capita income, the rate of saving and consequently the rate of net investment are at a low level. Efforts made to raise the rate of savings and investment through an increase in the rate of growth of total national income are accompanied by a high rate of population growth which pushes back the per capita income to its stable equilibrium level. Thus underdeveloped economies are caught in a *low-level equilibrium trap.*

Nelson mentions four social and technological conditions which are conducive to trapping. They are:

(i) A high correlation between the level of per capita income and the rate of population growth.

(ii) A low propensity to direct additional per capita income to increasing per

capita investment.

(iii) Scarcity of uncultivable arable land.

(iv) Inefficient methods of production.

He also points towards two other factors, cultural inertia and economic inertia. It is cultural inertia that leads to economic inertia, and vice versa.

A study of the economic development of underdeveloped countries **reveals** that most of them are caught in the low-level equilibrium trap due to presence of the above noted conditions.

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1. R.R. Nelson, "A Theory of the Low-level Equilibrium Trap," *AER*, December, 1956.

SETS OF RELATIONS

Nelson uses *three* sets of relationships to show the trapping of an economy at a low level of income.

First, income is a function of the capital stock, the level of technology, and the size of the population.

Second, net investment consists of capital created out of savings in the form of addition to the stock of tools and equipment in the industrial sector *plus* addition of new land to the amount of land under cultivation.

Third, "with low per capita incomes, short-run changes in the rate of population growth are caused by changes in the death rate, and changes in the death rate are caused by changes in the level of per capita income. Yet once per capita income reaches a level well above subsistence requirements, further increase in per capita income have a negligible effect on the death rate."

Given these sets of relationships, the Nelson thesis is explained in Fig. 1 Panels (A), (B), (C). In Panel (A), *y/p* relates to the level of per capita income which is measured on the horizontal axis, and *dp/p* is the percentage rate of growth of population measured on the vertical axis. The point *S'* on the horizontal axis where the growth curve of population *(dp/p)* equals the level of per capita

income, is the minimum subsistence level of per capita income. At this level, population is stationary. But to the left of S', population is decreasing. If we move above *S'*, along the growth curve of population, the growth rate of population increases up to the "upper physical limit" *U,* with increase in the per capita income above the minimum subsistence level. For some time, the population will grow at this level with rise in per capita income and then it starts declining from point M.

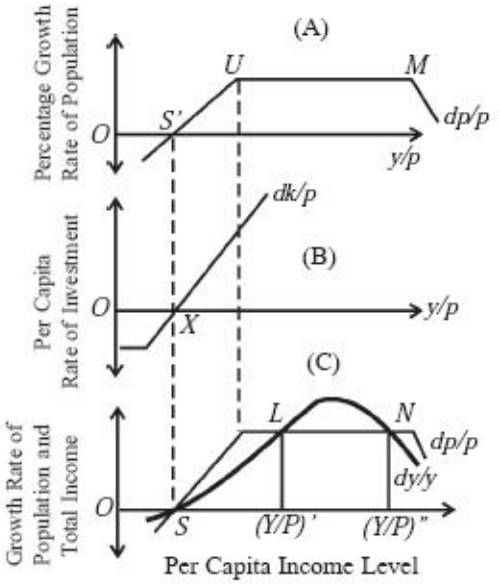

Fig. 1

In Panel (B), *dk/p* is the per capita rate of investment out of savings measured on the vertical axis. The curve *(dk/p)* is the growth curve of investment which relates the per capita rate of investment to different levels of per capita income. This curve intersects the horizontal axis at point *X* which is the level of zero saving. To the left of this point, there is *negative* investment. On the other hand, if we move above point *X* along the growth curve of investment, the per capita rate of investment will rise even beyond the upper physical limit of growth rate of population as denoted by point *U* in Panel *(A).*

In Panel (C), as usual, the horizontal axis measures the level of per capita income. On the vertical axis are measured the rate of population growth and the rate of growth in total income, is the growth curve of income, and is the growth curve of population at the various levels of per capita income. The point *S* is so drawn that it equals the zero saving level of income *X* and the minimum subsistence level of per capita income *S'* so that *S=X=S'*. *S* is the point of the *low-level equilibrium trap,* of the zero growth rate where the growth rate of income *(dy/y)* equals the growth rate of population *(dp/p)* on the horizontal axis. For any increase in per capita income beyond S, the growth rate of population is higher than the growth rate of income, so that the economy is pushed back to *S,* the point of stable equilibrium. Thus, the economy is caught in the low-level equilibrium trap. "This low-level equilibrium trap will be stronger the more quickly the rate of population growth responds to a given rise in per capita income and the more slowly the

rate of growth in total income responds to an increase in investment." To get out of this "trap" the economy requires "a discontinuous jump" beyond the per capita income level *(y/p)'* so as to reach the new point of unstable equilibrium L. Beyond this point, income grows at a higher rate than the growth rate of population which is stable at the upper physical limit. Thus the rise in per capita income is cumulative beyond level till the economy reaches level, where the growth rate of income equals the growth rate of population at a new stable equilibrium point *N.* Again, beyond point *N,* further government action is required to raise the growth rate of income above the growth rate of population.

FACTORS THAT AVOID TRAP

Nelson points towards a number of factors to escape the low-level equilibrium trap.

First, there should be a favourable socio-political environment in the country.

Second, the social structure should be changed by laying greater emphasis on thrift and entrepreneurship. Greater incentives should be provided to produce more, and incentives should also be provided to limit the size of the family.

Third, measures should be adopted to change the distribution of income, at the same time enabling accumulation of wealth by investors.

Fourth, there should be an all-pervading government investment programme.

Fifth, income and capital should be increased by obtaining funds from abroad.

Sixth , improved production techniques should be used to utilise existing resources more fully so that income is increased from given inputs.

To escape the low-level equilibrium trap in underdeveloped countries requires the simultaneous adoption of all these measures so that the growth rate of income is increased more than the growth rate of population. Once this is a achieved above a certain minimum per capita income level, sustained growth will take place without further government action until a high level of per capita income is reached.[2]

2. For criticism of the theory, refer to Leibenstein’s thesis, except point 4.

CHAPTER

The “Big Push” Theory

ROSENSTEIN-RODAN’S THESIS

The theory of the “big push” is associated with the name of Professor Paul N. Rosenstein-Rodan.[1] The thesis is that a “big push” or a large comprehensive programme is needed in the form of a high minimum amount of investment to overcome the obstacles to development in an underdeveloped economy and to launch it on the path to progress. To stress his argument, he quotes an analogy from an MIT Study : “There is a minimum level of resources that must be devoted to... a development programme if it is to have any chance of success. Launching a country into self-sustaining growth is little like an airplane off the ground. There is a critical ground speed which must be passed before the craft can become airborne...”[2] The theory states that proceeding “bit by bit” will not launch the economy successfully on the development path, rather a minimum amount of investment is a necessary condition for this. It necessitates the obtaining of external economies that arise from the simultaneous establishment of technically interdependent industries. Thus indivisibilities and external economies flowing from a minimum quantum of investment are a prerequisite for launching economic development successfully.

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1. Notes on the Theory of ‘Big Push’, *in Economic Development of Latin America, Ch.III* , (ed.) H.S. Ellis and W.W. Wallich, 1961.

2. *The Objectives of US Economic Assistance Programmes,* 1957.

Rosenstein-Rodan distinguishes between *three* different kinds of indivisibilites and external economies. *One*, indivisibilities in the production function, especially the indivisibility of the supply of social overhead capital; *two*, indivisibility of demand; and *three*, indivisibility in the supply of savings. Let us analyse the role of these indivisibilities in bringing economic development.

1. INDIVISIBILITIES IN THE PRODUCTION FUNCTION

According to Rosenstein-Rodan, indivisibilities of inputs, outputs or processes lead to increasing returns. He regards social overhead capital as the most important instance of indivisibility and hence of external economies on the supply side. The services of social overhead capital comprising basic industries like power, transport, and communications are indirectly productive and have a long gestation period. They cannot be imported. Their installations require a "sizeable initial lump" of investment. So excess capacity is likely to remain in them for some time. They also possess "an irreducible minimum industry *mix* of different public utilities, so that an underdeveloped country have to invest between 30-40 per cent of its total investment in these channels."

Thus, social overhead capital is characterised by four indivisibilities. *First*, it is irreversible in time and, therefore, must precede other directly productive investments. *Second*, it has a minimum durability, thus making it very lumpy. *Third*, it has a long gestation period. *Last*, it has an irreducible minimum industry mix of different kinds of public utilities. These indivisibilities of supply of social overhead capital are one of the principal obstacles to development in underdeveloped countries. Therefore, a high initial investment in social overhead capital is necessary to pave the way for quick-yielding directly productive investments.

2. INDIVISIBILITY OF DEMAND

The indivisibility or complementarity of demand requires simultaneous setting up of interdependent industries in underdeveloped countries. This is because individual investment projects have high risks because low incomes limit the demand for their products. To illustrate, Rosenstein-Rodan takes first a closed economy where a hundred disguised unemployed workers are employed in a shoe factory whose wages constitute an additional income. If these workers spend all their income on shoes they manufacture, the shoe market will have a regular demand and thus succeed. But the fact is that they would not like to spend all their additional income on shoes, human wants being diverse. Nor will the people outside the factory buy additional shoes when they are poor. Thus, the new factory will be abandoned for want of an adequate market. To vary the example, suppose ten thousand unemployed workers are engaged in

one hundred factories (instead of hundred workers in one factory) who produce a variety of consumer goods and spend their wages on buying them. The new producers would be each others' customers and thus create market for their goods. The complementarity of demand reduces the risk of finding a market and increases the incentive to invest. In other words, it is the indivisibility of demand which necessitates a high minimum quantum of investment in interdependent industries to enlarge the size of the market.

Rosenstein's example of the shoe factory is explained in Fig.1. The curves *ATC* and *MC* represent the costs of a plant which is a little smaller than the optimum-size plant. D_1 and MR_1 are the demand and marginal revenue curves of the shoe factory when investment is made only in it. It produces OQ_1 (10,000) shoes and sells at OP_1 price which does not cover the *ATC*. So the factory is incurring $CABP_1$ losses. But when simultaneous investment is made in a number of different industries, the market for shoes expands. The demand for shoes rises to D_4 (four times) so that the quantity of shoes becomes *OQ* (40,000). Now the shoe factory earns profits equal to P_4RST. Similarly, other industries earn profits.

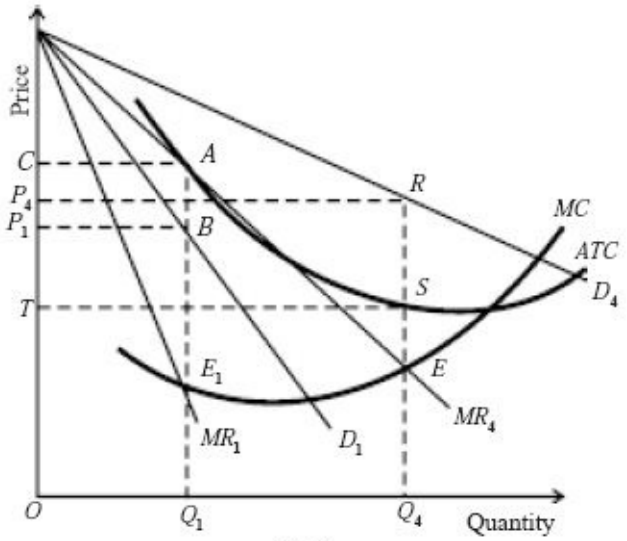

Fig. 1

3. INDIVISIBILITY IN THE SUPPLY OF SAVINGS

A high income elasticity of saving is the third indivisibility in Rosenstein's theory. A high minimum size of investment requires a high volume of savings. This is not easy to achieve in underdeveloped countries because of low incomes. To overcome this, it is essential that when incomes increase due to an increase in investment, the marginal rate of saving should be very much higher than the average rate of saving.

Given these three indivisibilities and the external economies to which they give

rise, a “big push” or a minimum quantum of investment is required to overcome the obstacles to development in underdeveloped countries. “There may be finally a phenomenon of indivisibility in the vigour and drive required for a successful development policy,” writes Rodan. But proceeding bit by bit in an isolated and small way does not lead to a sufficient impact on growth. A climate for development is only created when investment of a minimum speed or size is made within an underdeveloped economy.

A CRITICAL APPRAISAL

Rosenstein Rodan regards his theory of development superior to the traditional static equilibrium theory because it appears to contradict the latter’s motto that nature does make jumps. His theory is based on more realistic assumptions of indivisibilities and nonappropriabilities in the production functions. It examines the path towards equilibrium and not merely the conditions at a point of equilibrium. It is thus primarily a theory of investment concerned with imperfect markets in underdeveloped countries. It is a high minimum quantum of investment rather than price mechanism in such imperfect markets that takes an underdeveloped economy towards an optimum position.

The big push theory is, however, not free from certain defects.

1. Negligible Economies from Investment in Export and Import Substitutes. The main justification for a big push in investment on social overhead capital is the realization of extensive external economies. But as pointed out by Viner,[3] underdeveloped economies realize greater economies from world trade independently of home investment. Rodan has recognised this fact, but keeps silent over another reality that in the newly developing countries investment for export and for marginal import substitutes occupies a large chunk of total investment. The external economies argument for a big push does not hold because external economies are negligible in the above types of investments.

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3. “Stability and Progress: The Poorer Countries Problem,” in *Stability and Progress in the World Economy* , (ed.) D. Hague. 1958.

2. Negligible Economies even from Cost-Reducing Investments. Even in the

production of local consumer goods and most public utilities, potential external economies can be realized in a limited way. Investments in the case of fairly inelastic demand are cost-reducing rather than output-expanding. Since external economies accrue from the output-expansion in the initial industry, they are negligible in the case of cost-reducing investment.

3. Neglects Investment in the Agricultural Sector. One of the principal defects of the big push theory is that it emphasizes the importance of a high level of investment in capital goods and consumer goods industries and social overhead capital, except agricultural and other primary industries. In agriculture-oriented underdeveloped countries a big push of large investments in irrigation, transportation facilities, land reforms, and in improving agricultural practices through better tools, implements, fertilisers etc. are as important as investment in other industries. The neglect of the agricultural sector in such economies will retard rather than accelerate their development.

4. Generates Inflationary Pressures. Even the launching of a high minimum amount of investment on social overheads is highly expensive. Moreover, overhead capital has a high capital-output ratio and a very long gestation period. This makes the task of developing *UDCs* more difficult and longer. This is because such countries do not possess enough financial resources to provide social overhead capital required for the big push. The period during which social overhead capital is being formed will also be one of inflationary pressures because of the shortage of consumer goods. These inflationary pressures, in turn, would prolong the process of building social overhead capital, thus making it highly difficult for an *UDC* to achieve rapid economic development.

5. Low Investment Leads to Large Increase in Output. John Adler's statistical analysis of the economic development of the world reveals that "a relatively low level of investment pays off well in the form of additional output."[4] This conclusion is based on his study of low capital-output ratios in India, Pakistan and in many other Asian and Latin American countries. Thus, there appears to be little conclusive proof that a big push of investment is a prerequisite for the economic development of underdeveloped countries

6. Administrative and Institutional Difficulties. Further, the big push theory

is based upon a burst of state-engineered investment. Rosenstein himself points out that in the presence of imperfectly developed markets in underdeveloped countries, the price mechanism is a very poor signalling system. But the dependence on state investment itself poses a number of problems. The administrative and institutional machinery in such economies is weak and inefficient. Difficulties are bound to arise not only in drawing up the plans for various projects but also in their execution. Lack of statistical information, technical know-how, trained personnel and coordination between the various departments are some of the complex problems which are not easy of solution. Moreover, the majority of underdeveloped countries have a mixed economy, where the private and public sectors are mostly competitive rather than complementary. This leads to mutual rivalry and suspicion which are inimical to a balanced growth of the economy.

7. Not an Historical Fact. Last but not the least, Rodan's thesis is a sort of prescription for launching underdeveloped countries on the path to progress rapidly in the present. It is not an historical explanation of how development takes place. Historically, the presence or absence of a big push has not been a distinguishing feature of growth anywhere, according to Professor Hagen.[5]

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4. "World Economic Growth—Retrospect and Prospect," *RES*, August 1956.

5. E.E. Hagen, *On the Theory of Social Change*, 1962.

CHAPTER

The Doctrine of Balanced Growth

MEANING OF BALANCED GROWTH

The doctrine of balanced growth has several authors who interpret it in their own way. To some it means investing in a laggard sector or industry so as to bring it abreast of others. To others, it implies that investment takes place simultaneously in all sectors or industries at once. Still to others, it means balanced development of manufacturing industries and agriculture. [1]

Balanced growth, therefore, requires balance between different consumer goods industries, and between consumer goods and capital goods industries. It also implies balance between industry and agriculture, and between the domestic and export sector. Further, it entails balance between social and economic overheads and directly productive investments, and between vertical and horizontal external economies. In fine, the theory of balanced growth states that there should be simultaneous and harmonious development of different sectors of the economy so that all sectors grow in unison.

For this, balance is required between the demand and supply sides. The supply side lays emphasis on the simultaneous development of all inter-related sectors which help in increasing the supply of goods. It includes the simultaneous and harmonious development of intermediate goods, raw materials, power, agriculture, irrigation, transport, etc., and all industries producing consumer goods. On the other hand, the demand side relates to the provision for larger employment opportunities and increasing incomes so that the demand for goods and services may rise on the part of the people. The demand side is related to supplementary industries, consumer goods industries, especially agriculture and manufacturing industries. When with the simultaneous setting up of all types of industries, large number of people are employed, they create demand for each other's goods. In this way, all goods will be sold out.

The doctrine of balanced growth has been advocated by Rosenstein-Rodan, Ragnar Nurkse, and Arthur Lewis. Let us examine the concept in detail with reference to Rodan's and Nurkse's formulations.

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1. See. C.P. Kindleberger, *op. cit.,* Ch 9 for different interpretations.

EXPLANATION OF THE THEORY

Rosenstein-Rodan was the first economist who propounded the theory of balanced growth without using these words in his 1943 article. [2] He argued that the whole of the industry to be created in eastern and south-eastern Europe should be treated and planned like one huge firm or trust. His main contention is that "often SMP (Social Marginal Product) of an investment is different from its PMP (Private Marginal Product) and that when a group of industries is planned together in accordance with their SMPs, the rate of growth of the economy is greater than it would have been otherwise". This is because an individual entrepreneur is interested only in the PMP of investment and is not likely to have an accurate assessment of its SMP. In support of his argument, Rosenstein Rodan gives a number of examples where the SMP of an investment is greater than its PMP. It is complementarity of different industries which leads to the most profitable investment from the standpoint of the society. He gives the example of the shoe factory. Suppose a large shoe factory is started in a region where 20,000 unemployed workers are employed. If these workers spent all their wages on shoes, a market for shoes would be created. But the trouble is that the workers will not spend all their wages on shoes. If instead, a whole series of industries were started which produce the consumption goods on which workers would spend all their incomes, all the industries would expand via the multiplier process. The planned creation of such a complementary system of industries would reduce the risk of not being able to sell their products and would lead to a large scale planned industrialisation. This very idea has been developed and elaborated by Ragnar Nurkse in his thesis.

According to Nurkse, [3] vicious circles of poverty are at work in underdeveloped countries which retard economic development. If, however, they are broken, economic development will follow. The vicious circles

operate both on the supply side and the demand side.

On the supply side , there is the small capacity to save resulting from low real income. The low real income is due to low productivity which in turn is due to deficiency of capital. The deficiency of capital is the result of low capacity to save. *On the demand side* , inducement to invest is low because of low demand which is due to low level of real income of the people. The inducement to invest is, therefore, limited by the size of the market which in turn depends upon productivity because 'the capacity to buy is in fact the capacity to produce.' And productivity depends on the amount of capital used in production. But for an individual entrepreneur, the use of capital is inhibited by the small size of the market which in turn is limited by low productivity. Thus the vicious circle is complete.

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2. Problems of Industrialisation of Eastern and South-Eastern Europe, in *op. cit.* (ed.) Aggarwal and Singh.

3. *Problems of Capital Formation in Underdeveloped Countries* , Ch. 1.

How to Break these Circles? Individual investment decisions cannot solve the problem. Nurkse cites Rosenstein-Rodan's famous example of the shoe factory to substantiate his argument. Suppose, a shoe industry is set up. If in the rest of the economy nothing is done to increase productivity and purchasing power, the market for the additional shoe output is likely to be deficient. People engaged in the industry will not like to spend all their income on shoes, human wants being diverse. Nor will the people outside the new industry buy a pair of shoes every year when they do not have enough to meet their bare necessities. Thus, the new industry is likely to fail for want of the adequate market.

How Can the Market be Enlarged? The size of the market can be enlarged by monetary expansion, by salesmanship and advertising, by abolishing trade restrictions and by expanding the economic infrastructure. It can also be widened either by a reduction in prices (money incomes remaining constant), or by an increase in money incomes while keeping prices constant. This implies increase in productive efficiency and in real income. But in underdeveloped countries market is not large enough to permit production on a scale that may lead to reduction in costs. Moreover, inelastic consumer demand, technical discontinuities and lack of enterprise keep down the demand for capital.

Therefore, the only way out of this impasse, according to Nurkse, is "more or less synchronized application of capital to a wide range of different industries. Here is an escape from the deadlock, here the result is an overall enlargement of the market. People working with more and better tools in a number of complementary projects become each others' customers. Most industries catering for mass consumption are complementary in the sense that they provide a market for, and thus support each other. The case for 'balanced growth' rests on the need for a 'balanced diet'."

Nurkse takes the cue for the notion of balanced growth from Say's Law and cites Mill's formulation of it: "Every increase of production, if distributed without miscalculation among all kinds of produce in the proportion which private interest would dictate, creates or rather constitutes, its own demand." But a substantial use of capital by an individual entrepreneur in any particular industry may be unprofitable due to the small size of the market. On the contrary, a synchronized use of capital to a wide range of projects in different industries may raise the general level of economic efficiency and enlarge the size of the market. "A frontal attack of this sort–a wave of capital investments in a number of different industries"—has been called by Nurkse, balanced growth.

The way to do this is by a simultaneous wave of new plants composed in such a way that full advantage is taken of complementaries and external economies on the supply side and of the complementaritities of markets on the demand side. Investment in a wide range of industries leads to vertical and horizontal integration of industries, a better division of labour, a common source of raw materials and technical skill, an expansion of the size of the market and better utilization of social and economic overhead capital. Investment in productive equipment and in human capital should be simultaneous, for investment in the former would be useless unless people are educated and healthy to operate it. Nurkse pleads that social and economic overhead facilities should be created ahead of demand to stimulate and support the various sectors of the economy. Private enterprise in an underdeveloped country is incapable of taking advantage of these external economies because of its incapacity to start a wave of capital investments on a wide range of projects. But Nurkse believes that private enterprise can achieve the desired effect under the stimulus of certain incentives. [4] He pleads that ordinary price incentives may bring about balanced

growth in a small degree. However, a wave of new applications of capital over a wide range of different industries can be promoted by the monetary effects of the initial investment and other effects.

The doctrine of balanced growth requires a balance between different sectors of the economy during the process of economic growth. There should be proper balance between investment in agriculture and industry. Agriculture and industry are complementary. An increase in industrial output requires an expansion of agricultural output. If employment increases in the industrial sectors, it will lead to an increase in the demand for foodstuffs. Supplies of food must, therefore, be raised. Similarly supplies of raw materials should also rise with the expansion of the industrial sector. [5] It is imperative that the agricultural sector must also develop along with the industrial sector otherwise inflation will set in.

A balance is also required between the domestic sector and the foreign sector. "Export revenue is an important source for financing development; imports rise as production and employment expand; and domestic trade itself requires increasing imports of necessary materials and equipment. To pay for these rising imports, and to allow exports to finance development as much as possible, the country cannot expand its domestic trade at the expense of its foreign trade. The domestic sector must grow in balance with the foreign sector." [6] Nurkse observes, "Balanced growth is a good foundation for international trade, as well as a way of filling the vacuum at the periphery,". He underlines the importance of improvement in transport facilities and advocates reduction in transport costs, abolition of tariff barriers and creation of custom unions to enlarge the market in the economic and geographic sense. In this way, developing countries would become each others' customers, increase their per capita consumption of agricultural and manufactured goods with the increase in their income elasticity of demand. Nurkse does not advocate autarky. With the increase in domestic production, the domestic as well as the foreign market is likely to expand. But even if foreign trade shrinks due to restrictions imposed by other countries, the best way is to expand its output for domestic consumption, thereby increasing employment and income in the economy.

To sum up in the words of Lewis, "In development programmes all sectors of

the economy should grow simultaneously, so as to keep a proper balance between industry and agriculture and between production for home consumption and production for export... the logic of this proposition is as unassailable as its simplicity." [7]

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4. In his first Istanbul Lecture (1958), Nurkse said, "According to some writers the balanced growth argument implies that the market mechanism is eliminated and that investments must be effected according to a coordinated plan. This opinion...seems to me dubious. As a means of creating inducements to invest, balanced growth can be said to be relevant primarily to a private enterprise system. State investment can and often does go ahead without any market incentives. Planning authorities can apply capital, if they have any, in whatever they may choose...It is private investment that is attracted by markets and that needs the inducement of growing markets. It is here that the element of mutual support is so useful and, for rapid growth, indispensable" (*Equilibrium and Gowth in the World Economy).* This is not a correct view, for the price mechanism alone is not capable of producing the simultaneous and mutually supporting wave of investments required by balanced growth. It is only deliberate planning and coordination whether private or governmental that can do the trick.

5. Nurkse's entire argument relates to final consumer goods. So far as intermediate products are concerned, he favoured vertical imbalance in his second Istanbul Lecture (1961). Following Hirschman, he said that it is SOC investment that provides the necessary inducements leading to DPA investment.

6. Meier and Baldwin, *op. cit.* , p. 348.

7. W.A. Lewis, *op.cit.* , p. 283.

CRITICISMS OF THE DOCTRINE OF BALANCED GROWTH

The doctrine of balanced growth has been severely criticised by Hirschman, Singer, Kurihara and others on the following grounds:

1. Rise in Costs. Simultaneous establishment of a number of industries is likely to raise money and real costs of production and so make them economically unprofitable to operate in the absence of sufficient capital equipment, skills, cheap power, finance and other necessary raw materials.

2. No Attention to Reducing Costs. Kindleberger observes that instead of starting with new industries, Nurkse's theory does not consider the possibility of cost reduction in existing industries.

3. Other Problems. Granted that it is within the competence of an underdeveloped country to establish new industries, a number of other problems are likely to arise. When the new industries are established, the

demand for the products of the existing firms will decrease and make them unprofitable. At the same time the demand for factors of production will rise which is likely to raise the prices of factors of production in all industries. As J. Marcus Fleming has said, "Whereas the balanced growth doctrine assumes that the relationship between industries is for the most part complementary, the limitation of factor supply ensures that the relationship is for the most part competitive." [8]

4. Fails as a Theory of Development. According to Hirschman [9] the doctrine of balanced growth fails as a theory of development. Development implies the process of change from one type of economy into another more advanced type. But the doctrine of balanced growth would involve the superimposition of an entirely new self-contained modern industrial sector upon the stagnant and equally self-contained traditional sector. Hirschman opines, "This is not growth, it is not even the grafting of something new on to something old; it is a perfectly dualistic pattern of development."

5. Beyond the Capabilities of Underdeveloped Countries. Again, according to Hirschman, the doctrine "combines a defeatist attitude towards the capabilities of underdeveloped economies with completely unrealistic expectations about their creative abilities." On the one hand, officials in underdeveloped countries lament that the necessary skills and other resources for development are lacking in the economy. On the other hand, the protagonists of the balanced growth doctrine assume that persons lacking in skills and entrepreneurial ability become omniscient overnight and are in a position to start a chain of new industries. The whole doctrine thus appears to be a contradiction in itself. It seems strange that what cannot be done piecemeal, can be done in a big way and is considered to be within the physical and intellectual competence of an underdeveloped country. It is as if a builder, not in a position to construct the ground floor, were advised to build the next two floors instead. As Dr Singer has stated, "The advantages of multiple development may make interesting reading for economists but they are gloorny news indeed for the underdeveloped countries. The initial resources for simultaneous developments on many fronts are generally lacking." [10] If a country possesses enough skills and resources, she would not be underdeveloped in the first instance.

6. Disproportionality in Factors. Another problem in underdeveloped countries is the disproportionality in the factors of production. In some countries, labour is in abundance but capital and entrepreneurial skill are scarce. While in others, labour and capital are scarce but other resources are in abundance. This is a great hindrance to the practical application of the concept of balanced growth.

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8. J.M. Fleming, "External Economies and Balanced Growth," in Aggrawal and Singh, (ed.) *op. cit.* , p. 279.

9. A.O. Hirschman, *The Strategy of Economic Development,* p.52.

10. H.W. Singer, *Economic Progress in Underdeveloped Countries* , pp. 7-8.

7. Shortage of Resources. The doctrine fails to solve the problem of shortage of resources. It is based on Say's Law that supply creates its own demand. But supply of goods refers to the demand for factors, especially for capital which does not create its own supply. When investments are being made simultaneously in a number of new industries, the demand for factors would become competitive. But the supply of factors is inelastic in underdeveloped countries. Thus the main argument of the theory breaks down. Nurkse, however, assumes that resources are available for net investment and a given labour force is being equipped with an increasing stock of capital. But the problem of allocation of the increasing stock of capital still remains. In such a situation, writes Dr Singer, "perhaps guerilla tactics are more suitable for the circumstances of underdeveloped countries than a frontal attack."

8. Wrong Assumption of Increasing Returns. The doctrine of balanced growth pre-supposes the need for balanced investment to provide a growing demand, and the existence of increasing returns. But these two forces pull in opposite directions. If returns increase considerably, an underdeveloped country would not like to invest in a railway line and a roadway between the same points, and it will have to choose, for instance, between an oil refinery and a steel mill. If simultaneous investments are made in all related fields, the appearance of bottlenecks, raw materials, prices, factor shortages, etc., will lead to decreasing returns. Thus decreasing and not increasing returns favour balanced growth.

9. Capital Lumpiness not Essential for Development. Although capital

'lumpiness' of many social and economic overheads is often given as a reason for investing larger sums of money immediately, yet the experience of many developed countries suggests that many services can be provided initially at low investment costs. For example, there are other ways of generating electricity than by damming a big river, diesel-generating sets or thermal plants can be installed. If capital is extremely scarce, a low investment-low cost technique with a quick fruition-lag is more economical. As Dr Singer says, "Think Big" is sound advice to underdeveloped countries but 'Act Big' is unwise counsel if it spurs them to do more than their resources permit." [11]

10. Balanced Growth not Essential for Induced Investment. According to Kurihara, "Balanced growth is not, as Nurkse supposes, to be desired to induce private investment but to be desired for its own sake, as far as an underdeveloped country is concerned. Nurkse's complaints about an underdeveloped economy's restricted markets and low real income tending to inhibit the private inducement to invest would be unnecessary if autonomous public investment of a capacity increasing as well as income generating nature was allowed to play a greater role".

11. Does not Consider Planning. The Nurkesian doctrine of balanced growth is primarily related to private enterprise economy where the need for planning does not arise. In fact, simultaneous investment in all sectors requires planning, direction and coordination by the government. As aptly pointed out by Myrdal, "Nurkse did not explain how his limited desideratum of balanced growth of different industries.... should be fitted into the type of comprehensive planning that is the declared policy in all South Asian countries and that has a strong rationale in their actual situation." [12]

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11. Professor J.K. Galbraith has stressed the same point in *Economic Development in Perspective* (p. 25). He says, "Not long ago, in a neighbouring Asian country where there is much unemployment and scarcity of capital, I saw expensive automatic gates imported from abroad, being installed at the railroad crossing. These are a necessary development in those countries where no one is any longer available for the effective life of *a railway gateman* . But not here...and considerable money would have been saved and *utilized elsewhere* ." Italics mine.

12. Concept of Balanced Growth Applicable to Developed Countries. Further, the balanced growth doctrine is in fact the application of Keynesian underemployment situation to an underdeveloped economy. According to the

Keynesian theory, simultaneous multiple development during the upswing of the trade cycle can lead to a balanced recovery of economic activity "for the industries, machines, managers, and workers as well as consumption habits, are all there, only waiting to resume their temporarily suspended functions and roles." But in an underdeveloped economy, this is not so whether the state lends a helping hand or not. [13] Because in such economics there is no temporary suspension of economic activity. Economic activity is static. Capital, skills, factor supplies and economic infrastructure are woefully lacking. It is, therefore, wrong to apply a theory applicable to a developed economy on an underdeveloped economy.

13. Scarcities and Bottlenecks Encourage Growth. According to Paul Streeten, historically it was not balanced growth but scarcities and bottlenecks that provided the stimulus to the inventions that revolutionized England's and the world's economic system, and that inventions in turn created new scarcities and bottlenecks. Had the world depended on balanced development, it would have reduced or even eliminated the incentives for discoveries, or at any rate for their application. Thus it is on unbalanced growth that the history of technological progress rests.

Conclusion. We may conclude with Dr Singer that "the doctrine of balanced growth is premature rather than wrong in the sense that it is applicable to a subsequent stage of sustained growth rather than to the breaking of a deadlock." [14]

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12. G. Myrdal, *Asian Drama*, 1968.

13. A.O. Hirschman, *op. cit.*, p. 54.

14. Hans W. Singer, *International DevelopmentGrowth and Change*, 1964.

CHAPTER

The Theory of Unbalanced Growth

INTRODUCTION

The theory of unbalanced growth is the opposite of the doctrine of balanced growth. According to this concept, investment should be made in selected sectors rather than simultaneously in all sectors of the economy. No underdeveloped country possesses capital and other resources in such quantities as to invest simultaneously in all sectors. Therefore, investment should be made in a few selected sectors or industries for their rapid development, and the economies accruing from them can be utilized for the development of other sectors. Thus the economy gradually moves from the path of unbalanced growth to that of balanced growth. Economists like Singer, Kindleberger, Streeten, etc. have expressed their views in favour of the unbalanced growth doctrine which are in fact criticisms of the theory of balanced growth. It is, however, Hirschman who has propounded the doctrine of unbalanced growth in a systematic manner. [1]

HIRSCHMAN'S STRATEGY

The concept of unbalanced growth has been popularized by Hirschman. [2] It is his contention that deliberate unbalancing the economy according to a pre-designed strategy is the best way to achieve economic growth in an underdeveloped country. According to Hirschman, investments in strategically selected industries or sectors of the economy will lead to new investment opporunities and so pave the way to further economic development. He maintains that "development has of course proceeded in this way, with growth being communicated from the leading sectors of the economy to the followers, from one industry to another, from one firm to another." He regards development as a "chain of disequilibria" that must keep alive rather than eliminate the disequilibria, of which profits and losses are symptoms in a

competitive economy. If the economy is to be kept moving ahead, the task of development policy is to maintain tensions, disproportions and disequilibria. This "seesaw advance" is induced by one disequilibria that in turn leads to a new disequilibrium and so on *ad infinitum.*

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1. Rostow also favours unbalanced growth and explains in terms of the leading sectors.

According to Hirschman, when new projects are started they appropriate external economies created by previous projects and create new external economies that can be exploited by subsequent ones. There are some projects that appropriate more external economies that they create which he calls *convergent series* of investments. Hirschman also calls them induced investments for they are net beneficiaries of external economies. There are other projects too that create more external economies than they appropriate which he characterizes as *divergent series* of investments. From the point of view of the economy, the latter may have a greater social desirability than private profitability, whereas induced investments may be less desirable from the social viewpoint. In practice, development policy should aim at (*i*) the *prevention* of convergent series of investments which appropriate more external economies than they create; and (*ii*) the *promotion* of divergent series in which more economies are created than are appropriated. Development can only take place by unbalancing the economy. This is possible by investing either in social overhead capital (SOC) services or in directly productive activities (DPA). The former create external economies while the latter appropriate external economies.

Unbalancing the Economy with SOC. Social overhead capital has been defined as "comprising those basic services without which primary, secondary and tertiary productive activities cannot function." In SOC are included investments on education, public health, communications, transportation and conventional public utilities like light, water, power, irrigation and drainage schemes, etc.

A large investment in SOC will encourage private investment later in DPA. For example, cheaper supply of electric power may encourage the establishment of small industries. SOC investments indirectly subsidise agriculture, industry or commerce by cheapening various inputs which they use for reducing their

costs. Unless SOC investments provide cheap or improved services, private investments in DPA will not be encouraged. Thus the SOC approach to economic development is to unbalance the economy so that subsequently investments in DPA are stimulated. As Hirschman puts it, "Investment in SOC is advocated not because of its direct effect on final output, but because it permits and in fact invites DPA to come in.... Some SOC investment is required as a prerequisite of DPA investment."

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2. A.O. Hirchman, *op.cit.,* Chapters 4-7.

Unbalancing the Economy with DPA. An imbalance can also be created via DPA. A government might directly or indirectly invest in DPA instead of investing in SOC. If DPA investment is undertaken first, the shortage of SOC facilities is likely to raise production costs substantially. In course of time, political pressures might stimulate investment in SOC also. Investment sequences are generated by profit expectations and political pressures. Profit expectations generate the sequence from SOC to DPA and political pressures from DPA to SOC.

The Path to Development. Hirschman calls the first sequence (from SOC to DPA) "development via excess capacity of SOC" and the second sequence (from DPA to SOC) "development via shortage of SOC." As to which sequence should be followed first for economic development, Hirschman prefers that sequence which is "vigorously self-propelling." This is explained in Fig. 1.

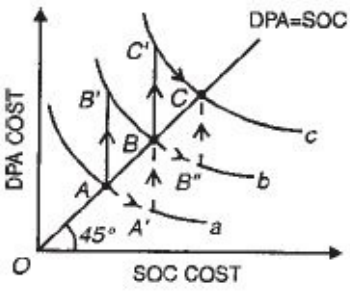

Fig. 1

DPA investments are measured along the vertical axis. The curves *a, b*, and *c* are isoquants showing various quantities of DPA and SOC which will give the same gross national product at any point. As we move to a higher curve, it represents a higher gross national product. The curves are so drawn that the 45° line through the origin connects the optimal points on the different curves. This line shows the balanced growth of DPA to SOC.

Hirschman makes two *assumptions: firstly,* that SOC and DPA cannot be expanded simultaneously, and *secondly,* that sequence of expansion should be adopted

which maximizes induced decision making.

If the path to development is followed via *excess capacity* of SOC, the economy will follow the dotted line *AA'BB"C.* When the economy increases SOC from *A* to *A'* on the same isoquant *a,* the induced DPA increases from *A* to *B'* until balance is restored at *B* where the whole economy is on a higher isoquant *b.* The higher gross national product thus achieved induces government to increase SOC further to *B"* from *B*, DPA also follows suit from *B* to point C via C' on more higher insoquant *c*.

If the other path to development via *shortage* of SOC is followed, the economy moves along the thick line *AB'BC'C.* When DPA increases to *B'* from *A,* SOC has to move to *A'* and then to *B.* When DPA is increased further to C' from *B,* balance requires SOC to increase to C via *B".*

It is to be noted that development path via excess SOC capacity is more continuous and smooth than the second path. It is in a way what Hirschuman calls self-propelling. The other path via SOC shortage capacity is not so, because if there is a belated adjustment of SOC, as it is likely to be due to the absence of political pressures in the beginning, the DPA cost of producing a given output rises. According to Hirschman, "Development via SOC shortage is an instance of the disorderly, compulsive sequence while via excess SOC capacity is essentially permissive."

Linkages. Having studied the virtues of specific imbalance, the problem is one of finding the kind of imbalance that is likely to be most effective. Any investment may have both forward linkage and backward linkage effects. Forward linkage effects encourage investment in *subsequent* stages of production, and backward linkage effects in *earlier* stages of production. Development should aim at discovering projects with the largest total linkage. Such projects vary from time to time and country to country, and can be found only by empirical studies of their input-output tables. Hirschman says, "The industry with the highest combined linkage score is iron and steel. Perhaps the underdeveloped countries are not so foolish and so exclusively prestige-motivated in attributing prime importance to this industry." But he opines further that "the industrial development clearly cannot be started everywhere with an iron and steel industry just because the industry maximizes linkage." The reason being the lack of interdependence and linkage in underdeveloped

countries. For example, agriculture, including primary production, and mining are weak in both backward and forward linkage effects. The primary production activities mostly of the enclave type leading to exports have little development effects on the economy in adding either to employment or to gross national product in an underdeveloped country.

Last Industries First. Hirschman, therefore, advocates the setting up of "last stage industries first.'" In making industrial products, a developing country need not undertake all the stages of production simultaneously. It can begin with the manufacture of durable consumer goods at the final stages of production. It can import many converting, assembling and mixing plants for final touches to almost finished products. In this way, the country can turn out finished consumer goods that it was previously importing, and then move on to the higher stages of production—to intermediate goods and machines through backward linkage effects. Backward linkage effects are important not only from secondary back to primary production, but also from tertiary back to both secondary and primary production. Backward linkage effects are the combined result of several last stage industries in a country. A backward linkage effect is produced by increases in demand. Therefore, when the demand for import-replacing commodities increases, it justifies some domestic last stage production. In other words, in the making of some products, when demand reaches a certain threshold, it is advantageous to manufacture the product at home. So long as the threshold is being reached, it pays to import the product. When the threshold is reached, Hirschman suggests subsidies or protection to import-replacing industries. But it is not desirable to give infant industry protection till the industry has been fully established. Hirschman calls last stage industries as import enclave industries. They are different for export enclave industries. The latter produce only for exports and are primarily related to staple products and minerals in LDCs. According to Hirschman, LDCs do not give due importance to the part played by exports in their economic development. They often treat exports like a step child. Their exports do not expand and fail to produce forward linkage effects within the economy. Hirschman, therefore, suggests export promotion which is the only practical way of achieving industrialisation via import substitution.

Hirschman sums up his Strategy of Economic Development in these words, "Economic development typically follows a path of uneven growth; that

balance is restored as a result of pressures, incentives, and compulsions; that the efficient path towards economic development is apt to be somewhat disorderly and that it will be strewn with bottlenecks and shortages of skills, facilities, services, and products; that industrial development will proceed largely through backward linkage, i.e., will work its way from the 'last touches' to intermediate and basic industry."

A CRITICAL APPRAISAL

The doctrine of unbalanced growth, as propounded by Hirschman, is a heroic attempt at pointing out the way to accelerate economic development for underdeveloped countries. It is realistic and takes into account almost all aspects of development planning. The various incentives, obstacles and resistances to development are studied in their proper perspective. The discussion of forward and backward linkage effects together with last stage production is highly useful. Hirschman's stress on export promotion and import sustitution further introduces a touch of realism. He is neither in favour of overall state planning of the Russian type nor does he leave everything on to the shoulders of private enterprise. Unless the *SOC* path of economic development is followed by the state, it will not encourage private investment in DPA, because private enterprise in an underdeveloped country is unable to create the necessary economic surplus required for development, to carry it further and even to sustain losses. He, therefore, appears to be in favour of a mixed economy.

ITS LIMITATIONS

The doctrine of unbalanced growth is, however, not free from certain limitations.

1. Inadequate Attention to the Composition, Direction and Timing of Unbalanced Growth. Paul Streeten criticising Hirschman's theory of unbalanced growth asks, "The crucial question is not whether to create imbalance, but *what* is the *optimum* degree of imbalance, *where* to imbalance and *how much* in order to accelerate growth; which are the 'growing points,' where should the spearhead be thrust, on which slope snowballs grow into avalanches." He thus points out that inadequate attention has been paid to the

composition, direction and timing of unbalanced growth.

2. Neglects Resistances. Streeten further points out that "the theory concentrates on stimuli to expansion and tends to neglect or minimize *resistances* caused by unbalanced growth." For instance, Hirschman neglects resistances in attitudes created by an imbalance. When development is the outcome of deliberate unbalancing the economy, the business attitudes change due to shortages and tensions, and there is lot of opposition and hostility. Hirschman neglects this type of reaction on the part of the existing institutions in underdeveloped countries.

3. Beyond the Capabilities of Underdeveloped Countries. Hirchman's development strategy is beyond the capabilities of UDCs because investment creates imbalances thereby creating pressures and tensions in the growth process which are overcome by the inducement mechanism. But pressures and tensions are bound to be serious in underdeveloped countries thereby hampering the process of development.

4. Lack of Basic Facilities. There may be lots of difficulties in procuring technical personnel, 'raw materials, and basic facilities like power and transport and even in finding out an adequate domestic and foreign market for the products.

5. Lack of Factor Mobility. Moreover, inducement mechanism is practicable where there is internal flexibility of resources. But in undedeveloped countries it is difficult and impossible to shift resources from one sector to another.

6. Emergence of Inflationary Pressures. One of the serious limitations of the unbalanced growth doctrine is the development of inflationary pressures within the economy. When large doses of investment are being injected into the economy at certain strategic points, income will rise which may tend to increase the demand for consumer goods relative to their supply. Shortages arise due to strains, pressures and tensions. Such a situation leads to inflationary rise in the price level. It becomes difficult to control prices in underdeveloped countries, as the governments are incapable of wielding monetary and fiscal measures effectively.

7. Linkage Effects not Based on Data. Hirschman's analysis of the linkage

effects suffers from the fact that it is not based on data pertaining to an underdeveloped country where social overhead facilities are not fully developed for a generation or so.

8. Too much Emphasis on Investment Decisions. Hirschman's development strategy is largely related to maximising investment decisions. No doubt decision making is a crucial factor in economic development, yet underdeveloped countries need not only investment decisions but also administrative, managerial and policy decisions. Thus Hirschman lays too much emphasis on investment decisions as compared to other important decisions essential for development.

Conclusion. Despite these weaknesses the technique of unbalanced growth has come to be recognised as a novel technique for the development of underdeveloped countries. Russia was the first country to adopt it and has been successful in accelerating its rate of economic growth within a short-period of time. India also followed suit by adopting this technique with the Second Five-Year Plan. Whereas Russia could succeed by creating large surpluses in the heavy industries sector and by keeping down the consumption levels, in India such an extreme policy is impracticable. Here investments in heavy industries are being kept up at a high level in the five-year plans and at the same time every effort is being made to step up production of consumer goods. But nothing is done to keep the consumption levels low in order to generate large economic surplus. The continuous rise in the price level however tends to keep the *real* consumption standards low. Unless the government controls the inflationary pressures, planning with unbalanced growth will fail to achieve the goal of self-sustaining growth.

BALANCED Vs . UNBALANCED GROWTH

Having examined critically the doctrines of balanced and unbalanced growth, we attempt an overview of these strategies of economic development.

DIFFERENCES

The case for balanced growth rests on the fact that vicious circles of poverty are at work in underdeveloped countries which are responsible for the small

size of the local market for their goods. The solution lies in a balanced pattern of investment in a number of mutually supporting different industries so that the size of the market is enlarged.

Its critics argue that an underdeveloped country does not possess sufficient resources in men, materials and money for simultaneous investments in a number of complementary industries. Another serious weakness of this doctrine is that it emphasises the complementarity of markets for final goods, primarily consumer goods as an inducement to invest and leaves out intermediate goods markets.

Proponents of unbalanced growth strategy favour investments in selected sectors rather than simultaneously in all sectors of the economy. Investments in selected sectors lead to new investment opportunities. This is possible by deliberately unbalancing the economy. The aim is to keep alive rather than eliminate the disequilibria by maintaining tensions, disproportions and disequilibria.

The strategy of unbalanced growth aims at removing scarcities in underdeveloped countries by induced investment decision-making. Critics point out that in such countries decision-making itself is scarce along with other resources. Moreover, creating imbalances within the economy by making investments in strategic sectors in the face of acute shortage of resources leads to inflationary pressures and balance of payments difficulties in underdeveloped countries.

Despite these differences in approaches, the doctrines of balanced and unbalanced growth have two common problems: *one* , relating to the role of the state, and *two* , the role of supply limitations and supply inelasticities.

Nurkse believes that balanced growth is relevant primarily to a private enterprise system. “It is private investment that is attracted by markets and that needs the inducement of growing markets. It is here that the element of mutual support is so useful and, for rapid growth, indispensable.” But critics point out that private enterprise alone is incapable of taking investment decisions in underdeveloped countries. Therefore, balanced growth presupposes planning.

On the other hand, in Hirschman’s unbalanced growth strategy, the state plays

an important role in encouraging SOC investments thereby creating disequilibria. If development starts via investment in DPA, political pressures force the state to undertake investments in SOC. Thus unbalanced growth also requires state planning.

Since both balanced growth and unbalanced growth involve lumpy investments in complementary activities, they require state planning. In order to get investment decisions implemented and to benefit from complementarities, coordination between the private and public sectors is essential in an underdeveloped country, whether it adopts the strategy of balanced growth or unbalanced growth.

The other problem concerning the two strategies is the role of supply limitations and supply inelasticities. Nurkse's theory of balanced growth is mainly related to the lack of demand, and neglects the role of supply limitations. This is not a correct view because underdeveloped countries woefully lack in the supply of capital, skills, economic infrastructure and other resources which are inelastic in supply. But the demand for final goods can be created by import restrictions and export promotion without recourse to the strategy of balanced growth.

The unbalanced growth doctrine also neglects the role of supply limitations and supply inelasticities. Though it emphasises the scarcity of decision making, yet it ignores the scarcity of physical, human and financial resources in an underdeveloped country.

Thus both strategies err in neglecting supply limitations and base their arguments on the developed countries which have high elasticity of supply of resources.

SIMILARITIES

This distinction between balanced and unbalanced growth techniques leads to certain points of similarities between the two. *First* , both believe in the existence of a private enterprise system based on market mechanism under which they operate. At the same time, they imply the operation of state planning. *Second* , both ignore the role of supply limitations and supply inelasticities. *Lastly* , both the doctrines assume interdependence, but of

different degrees. In balanced growth, the development of one sector is dependent on the development of other sectors. On the other hand, under unbalanced growth, the economy gradually moves on the path of economic development via tensions, disproportions and disequilibria, and ultimately reaches balanced growth. Thus both the strategies involve interdependence among different sectors of the economy, but the interdependence is of different degrees.

CONCLUSION

The controversy between balanced and unbalanced growth has been stretched too far and has become almost barren. Keeping in view the scarcity of resources in a developing country, the best course is to adopt the strategy of unbalanced growth. Under this strategy, SOC should be developed first which will encourage subsequent investments in DPA when the economy will ultimately move on the path to balanced growth. The experience of many developing countries like India reveals that unless such SOCs as power, irrigation, manpower, transport, etc. are developed first, the development of agriculture, industry and commerce is retarded. The rapid development of Russia has of course proceeded in this way with growth being communicated from the leading to the followers. But developing countries wedded to democracy should try to control the twin evils of inflation and adverse balance of payments while pursuing this strategy of development.

CHAPTER

Dualistic Theories

SOCIAL DUALISM

J.H Boeke,[1] a Dutch economist, has been one of the pioneers who developed a distinctive theory applicable only to underdeveloped countries. His theory of "social dualism" is a general theory of economic and social development of underdeveloped economies based primarily on his studies of the Indonesian economy.

Meaning. Dr. Boeke maintains that there are three characteristics of a society in the economic sense. They are the social spirit, the organizational forms and the technique dominating it. Their interdependence and interrelation are called the social system or social style. A society is homogeneous where only one social system prevails. But a society may have two or more social systems simultaneously. It is then a dual or plural society. Boeke reserves the term "dual society" for "societies showing a distinct cleavage of two synchronic and full grown social styles which in the normal, historical evolution of homogeneous societies are separated from each other by transitional forms, as, for instance, precapitalism and high capitalism by early capitalism."[2] Such a dual society is characterized by the existence of an advanced imported western system and an indigenous precapitalist agricultural system.

1. J.H., Boeke,*Economics and Economic Policy of Dual Societies*, 1953: 'Three Forms of Disintegration in Dual Societies,' *Indonesia*. April 1954; and 'Western Influence on the Growth of Eastern Population.' *Economics Internationale*, May 1954.

2. *Ibid.*, p. 43.

The former is under western influence and supervision, which uses advanced techniques and where the average standard of living is high. The latter is native with low levels of technique economic and social welfare. Boeke calls it

"social dualism" and defines it as "the clashing of an imported social system with an indigenous social system of another style. Most frequently the imported social system is high capitalism. But it may be socialism or communism just as well, or a blending of them."[3]

Characteristics of Dualistic Society. Boeke gives the economic theory of a dualistic society "to describe and to explain the economic interactions of two clashing social systems," which he terms 'dualistic economies' or 'eastern economics.' He bases his theory largely on the Indonesian experience.

There are certain characteristics of the *eastern sector* of a dualistic economy which distinguishes it from a western society. The needs of an eastern society are limited. People are satisfied when their immediate needs are met. "When the price of coconut is high the chances are that less of the commodities will be offered for sale; when wages are raised the manager of the estate risks that less of the work will be done; if three acres are enough to supply the needs of the household a cultivator will not till six; when rubber prices fall the owner of a grove may decide to tap more intensively, whereas high prices may mean that he leaves a larger or smaller portion of tapable trees untapped.[4] This is because people are influenced more by social rather than economic needs. Goods are evaluated according to their prestige value rather than value-in-use. It is, therefore, not surprising that eastern economies are characterized by backward-sloping supply curves of effort and risk-taking.

Native industry has practically no organization, is without capital, technically helpless and ignorant of the market. People indulge more in speculative activities rather than in regular profit-giving enterprises. They do not believe in capital investments attended by risks. They lack initiative and organizational skill characteristic of the western sector of a dual society. They are fatalists and hesitate to use modern technology. Labour is "unorganized, passive, silent, casual" and unskilled. People are reluctant to leave the village community. Migration within the country and immigration take place through state intervention. Urban development takes place at the cost of rural life. Export is the main objective of foreign trade in eastern society as distinct from a western society where it is the only means which makes imports possible.

Inapplicability of Western Economic Theory. These distinctive features of an

eastern society make western economic theory totally inapplicable to underdeveloped economies. According to Boeke, western economic theory is meant to explain capitalistic society, whereas the eastern society is pre-capitalistic. The former is based on unlimited wants, a money economy, and different types of cooperative organisations. Moreover, it is wrong to apply the marginal productivity theory of distribution to explain the allocation of resources or the distribution of income in an underdeveloped economy because of the immobility of resources in such a society. Boeke, therefore, warns that "we shall do well not to try to transplant the tender, delicate hot-house plants of western theory to tropical soil, where an early death awaits them."[5] Thus it is not possible to apply the same policy for the whole economy because what is beneficial for one society may be harmful for the other.

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3. *Ibid.*, p. 144.

4. *Ibid*., p. 40

5. *Ibid*., p. 143

Since eastern economies are dualistic in character, any effort to develop their pre-capitalistic agriculture along western lines will prove not only abortive but may also cause retrogression. Change in the mental attitudes of farmers is essential for the introduction of modern agricultural techniques, otherwise increase in wealth following them will result in further growth of population. If, however, western technology fails the result will be increased indebtedness. Therefore, their existing agricultural system should not be disturbed, for it could hardly be improved upon.

In the industrial field, the eastern producer cannot adapt himself to his western counterpart "technologically, economically or socially." If the former tries to imitate the latter, he will suffer in doing so. In support of his argument, Boeke cites the Indonesian case where the adoption of western technology to industrialize the Indonesian economy has moved the goal of self-sufficiency farther and ruined its small industry.

Boeke refers to five kinds of unemployment in underdeveloped countries: seasonal, casual, unemployment of regular workers, unemployment of the white collared, and unemployment of Eurasians. He believes that "it is not

within the power of the government to remove them as it would entail a financial burden far beyond the government's means."

In underdeveloped countries, limited wants and limited purchasing power hamper all economic development. Increase in food supply or industrial goods will bring a glut of commodities in the markets with the consequent fall in prices and to depression. This does not mean that Boeke is averse to all industrialization and agricultural improvements. Rather, he is in favour of a slow process of industrializaion and agricultural development on a small scale, adapted to the dualistic structure of eastern society. The urge for development should come from the people themselves. New leaders must emerge who should work towards the goal of economic development with faith, charity and patience.[6]

A Critical Appraisal

Boeke's theory of dualistic development has been severely criticised by Prof. Benjamin Higgins[7] on the following grounds:

1. Wants not Limited. Boeke's contention that people in underdeveloped economies have limited wants or backward-sloping supply curves of effort and risk-taking is not borne out by the experience of Indonesia itself. Both the marginal propensity to consume and to import are high there. People do not have limited needs, rather there is a great demand for both domestic and imported semi-luxuries. To restrict their demand the Indonesian Government have to impose import restrictions. This is not peculiar to Indonesia alone. Even the Indian authorities have adopted rigorous import and exchange controls to restrict the illegal inflow of semi-luxuries. A good harvest in India results in a spate of orders for radios, transistors, bicycles, watches, etc.

2. Casual Labour not Unorganised. Boeke's characterization of the eastern casual worker as unorganized, passive, and silent is "inconsistent with the growing strength of organised labour in Indonesia, India and elsewhere." Casual labour may not be fully organised in agriculture but in tea, coffee, and rubber plantations, the trade union movement is the strongest in such economies.

6. Boeke, *Western Influence on the Growth of Eastern Population*, pp. 366-69.

7. B. Higgins, "The Dualistic Theory of Underdeveloped Areas," *Economic Development and Cultural Change*, January, 1956.

3. Eastern Labour not Immobile. It is not possible to accept Boeker's view that people in eastern economies are reluctant to leave their village communities. In fact, city life, with all its attractions like cinemas, shops, cafes, and sports events, has always led to migrations from rural areas. Congestion, unemployment and inadequate basic amenities found in larger towns are in turn the consequence of the latter. Further, income incentives also lead to the movement of labour from one plantation to the other and even of casual workers from factories to rural areas during the harvesting season. Higgins opines that "I see no evidence that Oriental labour is '*intrinsically*' more immobile than western labour."

4. Not Peculiar to Underdeveloped Economies. Boeke ascribes his dualistic theory *only* to eastern economies though he himself admits that social dualism also exists in underdeveloped economies of Africa and Latin America. But it is not peculiar to underdeveloped areas only. It exists in Italy, Canada and even in the United States. Rather every economy "can be divided into distinct regions, with different degrees of technological advance."

5. Applicable to Western Societies. Many of the specific characteristics of the eastern society described by Boeke, seem to Higgins to be attributable to western societies as well. Whenever chronic inflation exists or threatens western economies, people prefer speculative profit to long-term investments. "Western economists," according to Higgins, "have recently developed a whole field of analysis relating to 'liquidity preference' and 'safety-preference' to take account of the reluctance of investors the world over to accent risk or illiquidity, and their strong preference for keeping their capital in safe and liquid form."

Further, Boeke's contention that people in eastern economies buy goods for *prestige-value* attached to them rather than for use value is equally true in the case of western economies. Were it not so, the term "conspicuous consumption" would not have been coined by Veblen for the American society.

Even the *backward-sloping supply curve* of effort is not peculiar to eastern

economies but was experienced by Australia during the post-war period and in the United States in the 1950's. Prof. Higgins contends that "this backward-sloping supply curve... appears in any society which stagnates (or slows down) long enough to weaken the "demonstration effect," provided by people moving from one standard of living to another, as a result of their own extra effort, directed specifically towards earning additional income."

6. Not a Theory but Description. Dr. Boeke fails to provide a distinctive economic and social theory for underdeveloped economies. His dualistic theory is merely a description of eastern society in which he tries to demonstrate the peculiar features of an eastern society that must not be developed on western lines. Boeke's contention that western economic theory is inapplicable to eastern societies is based on the neo-classical theory which has limited applicability even in the western world.

7. Tools of Western Economic Theory Used in Eastern Societies. Some of the tools of western economic theory underlying monetary and fiscal policies and those aimed at removing balance of payments disequilibrium are applicable to eastern societies with slight variations. Prof. **Higgins** believes that the solution to the problem of underdevelopment can be found 'by applying familiar tools of economic and social analysis, within a model defined by appropriate institutional assumptions.'

8. Does not Provide Solution to the Problem of Unemployment. Boeke's dualism centres more on socio-cultural aspects rather than on economic. He regards unemployment of various types as "beyond the reach of government help," and makes no mention of underemployment which is a dominant feature of densely populated underdeveloped economies. This is a big lacuna in Boeke's dualistic theory.

Conclusion. In fact, the important problem in dualistic economies is one of providing adequate employment opportunities to the existing and perspective underemployed labour force. This has led to the development of the theory of technological dualism by Higgins which "looks to resource endowments and differences in the production functions in the two sectors as the basis of a 'technological dualism' which in turn has resulted in an inadequate number of openings for productive employment." This is a more realistic dualistic theory than Boeke's, for it analysis the effects of a dualistic society on the pattern of

development.

TECHNOLOGICAL DUALISM

As an alternative to Boeke's social dualism, Prof. Higgins[8] has developed the theory of technological dualism. Technological dualism implies the use of different production functions in the advanced sector and the traditional sector of an underdeveloped economy. The existence of such dualism has accentuated the problem of structural or technological unemployment in the industrial sector and disguised unemployment in the rural sector. Higgin's theory of technological dualism incorporates the *factor proportions problem*[9] as discussed by R.S. Eckaus and is related to limited productive employment opportunities found in the two sectors of an under developed economy because of market imperfections, different factor endowments and production functions.

In fact underdeveloped countries are characterized by *structural disequilibrium at the factor level*. "Disequilibrium at the factor level may arise either because a single factor, receives different returns in different uses or because price relationships among factors are out of line with factor availabilities." Such disequilibrium leads to unemployment or underemployment in two ways in underdeveloped countries, according to Dr. Eckaus.

One, imperfections in or malfunctioning of the price system.

Two, limitations in the existing technology or the structure of demand leading to surplus labour in densely populated backward countries. Thus*technological* unemployment in an underdeveloped country may refer to surplus labour arising from malallocation of resources, the structure of demand and technological restraints.

Higgins builds his theory around two goods, two factors of production and two sectors with their factor endowments and production functions. Of the two sectors, the industrial sector is engaged in plantations, mines, oil fields, refineries, or large scale industry. It is capital-intensive and is characterized by fixed technical coefficients. In other words, there is no technical substitutability of factors which are combined in fixed proportions. The rural sector is

engaged in producing foodstuffs and handicrafts or very small industries. It has variable technical coefficients of production so that it can produce the same output with a wide range of techniques and alternative combinations of labour and capital (including improved land).

The production function in the industrial sector is represented in Fig. 1. Units of labour are measured on the horizontal axis, and units of capital on the vertical axis.

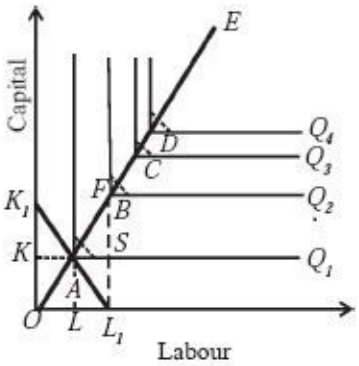

Fig. 1

The curve Q_1 is an isoquant representing combination of *OK* of capital and *OL* of labour producing a certain level of output. The curves Q_2, Q_3 and Q_4 represent higher levels of output which are only possible by increasing the units of capital and labour in the same proportions. Thus points *A, B, C* and *D* show fixed combinations of capital and labour used to produce different levels of output Q_1, O_2, O_3, and Q_4. The line *OE* joining these points is the expansion path of the industrial sector and its slope represents constant proportions of the two factors. The line K_1L_1 shows that the production process is capital-intensive, more capital is required to produce a given output relatively to labour. To produce Q_1 output, *OK* units of capital and *OL* units of labour are used. If however, the actual factor endowment is at *S* instead of at A, it means that more labour units *(*OL_1*)* are available to produce the same Q_1 output, the units of available capital remaining the same *(OK).* Since there are fixed technical coefficients, the excess labour supply will not affect production techniques at all, LL_1 units of labour will remain unemployed. It is only when capital stock increases to *SF* that it is possible to absorb this excess labour supply in this sector, otherwise it will have to seek employment in the rural sector.

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8. B. Higgins, *Economic Development*, pp. 325-33.

9. R..S. Eckaus, "*The Factor Proportions Problem in Underdeveloped Areas*," in Aggarwal and Singh (ed.),*op. cit.*

In reality, however, technical coefficients are not so rigidly fixed. Rather, they are somewhat flexible. The dotted curvature of the isoquants indicates the possibilities of some flexibility in factor proportions. It shows very small changes in factor endownments for which entrepreneurs would not like to make drastic changes in techniques of production. Thus they would prefer to have fixed technical coefficients.

The production function for the rural sector is shown in Fig. 2. The isoquant curves Q_1, Q_2, Q_3 and Q_4 show variable coefficients of production. In order to produce more output, more labour is employed in relation to capital (improved land). Ultimately good land becomes scarce and all available land is cultivated by highly labour-intensive techniques at point *E* where the maximum output level Q_n is reached. Given the different production functions in the two sectors, Professor. Higgins analysis the process whereby technological dualism has tended to increase unemployment and disguised unemployment in the dual economies. Of the two sectors, the industrial sector develops and expands with the aid of foreign capital. Thus industrialization leads to the growth of population much in excess of the rate of capital accumulation in the industrial sector. Since this sector uses capital-intensive techniques and fixed technical coefficients, it is not in a position to create employment opportunities at the same rate at which population grows. Rather industrialization may even bring, 'a relative decline in the proportion of total employment in that sector.' Thus the surplus labour has no other alternative except to seek employment in the rural sector.

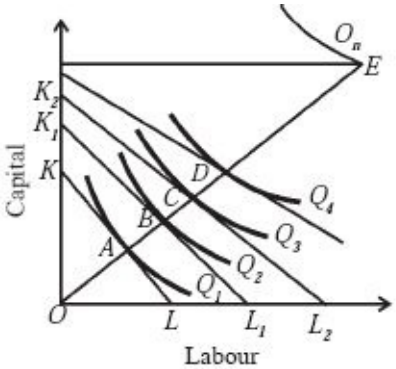

Fig. 2

Before the start of the expansion process, the rural sector has neither an abundance nor scarcity of factors of production. In the beginning, it may be possible to absorb the additional labour force by bringing more land under cultivation. This leads to the optimal combination of labour and capital (improved land) as output increases. Eventually, good land becomes scarce. The ratio of labour to capital available in that sector rises steadily and since technical coefficients are available, techniques become increasingly variable in this sector. For example, in many Asian countries, irrigated rice cultivation has been substituted for shifting dry rice cultivation. Ultimately, all available land

is cultivated by highly labour-intensive techniques and the marginal productivity of labour declines to zero or even below zero. Thus with continuing growth of population, disguised unemployment begins to appear. Under these circumstances, farmers have no incentive either to invest more capital or to introduce labour-saving technique. Besides, there is no available techniques to increase the output per man, and no incentive on the part of labour to raise production by themselves. As a result, techniques of production, man-hour productivity and socio-economic welfare remain at a low level in the rural sector.[10]

In the long run, technological progress does not help in removing disguised unemployment. Rather, it tends to augment it. Prof., Higgins contends that during the last two centuries little or technological progress has occurred in the rural sector while there has been rapid technological progress in the industrial sector. This has tended to increase the number of the disguised unemployed. The situation is further aggravated by keeping wage rates artificially high by trade union activities or by government policy. For, high industrial wage rates relative to productivity provide an incentive to entrepreneurs for introducing labour-saving techniques and thereby diminish still further the capacity of the industrial sector to absorb surplus labour. Accordingly, these factors perpetuate the tendency towards technological dualism in underdeveloped countries.[11]

A CRITICAL APPRAISAL

Prof. Higgins tries to present an historical evolution of the modern and traditional sectors leading to a steady rise in underemployment in the latter sector. Technological dualism appears to be superior to Boeke's social dualism. It is realistic for it takes into account how disguised unemployment gradually arises in the rural sector of the dualistic societies.

Its Defects— But the theory is not without limitations.

1. Coefficients not Fixed in Industrial Sector. Whereas production has taken place with variable technical coefficient in the rural sector, it is doubtful that production in the industrial sector has been actually carried on with fixed coefficients. It is improper to assume fixed technical coefficients in the

industrial sector without any empirical verification.

2. Factor Prices do not Depend upon Factor Endowments. This theory indicates why factor endowments and different production functions have led to rise of disguised unemployment in the rural sector. This is vitally connected with the pattern of factor prices. But factor prices do not solely depend on factor, endowments.

3. Neglects Institutional Factors. Moreover, there are many institutional and psychological factors that also influence factor proportions which have been neglected by Higgins.

4. Neglects the Use of Labour Absorbing Techniques. Further, Higgins' contention that highly capital-intensive processes are imported for use in the industrial sector altogether neglects the use of other techniques that are labour absorbing. All imported techniques are not labour-saving. For instance, the Japanese agricultural development cannot be attributed to the use of capital-intensive techniques. Rather, it was due to the application of better seeds, improved methods of cultivation, increasing use of fertilizers, etc.

5. Size and Nature of Disguised Unemployment not clarified. Higgins does not clarify the nature of disguised unemployment in the rural sector and excess labour supply in the industrial sector. Nor does he refer to the actual extent of the disguised unemployed resulting from technological dualism.

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10. B. Higgins, *op. cit.*, p. 329.

11. Ibid., p. 330.

FINANCIAL DUALISM

Prof. Myint[12] has developed the theory of financial dualism. Financial dualism refers to the co-existence of different interest rates between the organised and unorganised money markets in the LDCs. The rate of interest in the unorganised money market in the traditional sector is much higher than the rate in the organised money market in the modern sector.

The unorganised money market consists of the non-institutional lenders, such

as the village money-lenders, landlords, shopkeepers, traders or the combination of some of them. They charge very high interest rates on loans. The main reason is that there is a real shortage of savings in the traditional sector as substantial amount of savings is hoarded in gold and jewellery. Even though risks and costs of lending money to a large number of small borrowers are very high, yet there are other contributory factors arising from imperfections in this unorganised money market. The village shopkeepers, landlords, money-lenders and traders occupy strategic positions in the village economy and create monopoly powers over the peasants. These arise because of personal and informal dealings with borrowers, flexibility in loan transactions, and blending of money-lending with other types of activities such as selling of goods. "The high rates of interest which the peasants have to pay are not only formal interest charges but also an considerable part concealed charges obtained through manipulating the prices of the commodities which the peasants buy or sell. Concealed charges may take the form of very high prices for goods on credit terms at the local shop or the obligation to repay the landlord the loans advanced with a specified amount of the crop at harvest."

On the other hand, in the organised money market of the LDCs, the interest rates are low and credit facilities are abundant. The organised money market consists of the commercial banks and other financial ' institutions which lend short-term credit at low interest rates to the modern business sector consisting of the big foreign-owned enterprises in the export industries, the government and the large-scale modern manufacturing enterprises. Myint points towards two differences between the old financial dualism which existed in the open economy of the colonial period and the new financial dualism which now exists in the closed economy of the LDCs following domestic industrialisation policies.

First, under the colonial system, the currency system was automatic and ensured free convertibility at fixed exchange rates. Consequently, there was no shortage of foreign exchange and no balance of payments problem. But the present LDCs are faced with chronic domestic inflation and balance of payments difficulties. As a result, small business units such as peasants, small traders, handicraft producers, etc. in the traditional sector have to face not only high interest rates but also inaccessibility to foreign exchange and imports.

Second, under the colonial system, the organised money market of the LDCs

consisted of the branches of western commercial banks which were linked with the international financial market. The modern sector in the colonial system consisting of the mines, plantations and foreign trading enterprises could borrow at low interest rates both from the commercial banks and from the world capital markets. But the present LDCs have attained monetary independence with the establishment of their own central banks. They have introduced foreign exchange controls and have restricted profit remittances and transfer of funds by foreign commercial banks. As a result, the organised money market of the LDCs has been separated from the world capital market. Coupled with this, they have been following cheap money policy. This has led to the paradoxical situation in which the central banks in the capital-scarce LDCs are maintaining low interest rates than those prevailing in the capital-rich developed countries thereby overvaluing their exchange rates. They fear that devaluation will lead to repeated devaluation of their currencies and to inflationary pressures.

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12. H. Myint, *Economic Theory and the Underdeveloped Countries,* 1971 and *The Economics of the Developing Countries,* 5/e, 1980.

Further, the LDCs are faced with inflationary pressures, declining foreign exchange reserves and balance of payments pressures. Thus there is a chronic excess demand for foreign exchange at the overvalued exchange rates. To overcome this, they have concentrated on foreign exchange and import control and on monetary and fiscal measures and direct controls.

This had led to aggravation of the economic dualism between the traditional sector and the modern industrial sector. These fiscal and monetary policies have tended to favour the modern industrial sector as against the traditional sector. The cheap money policy by maintaining an artificially low interest rates has made credit available to large indiistrial concerns at favourable terms. The low interest rates have discouraged the flow of capital funds from abroad and savings from within the country, but have created an excess demand for loans. Thus the bulk of domestic savings at low interest rates have flowed to the modern industrial sector. This has reduced the supply of capital to the traditional small industries and the agricultural sector which have to get it at higher interest rates.

Further, the imposition of controls on foreign exchange and imports to correct the adverse balance of payments have benefitted the modern industrial sector as against the traditional sector. The modern sector is usually allocated the major portion of the available foreign exchange and the manufacturing industries are encouraged to adopt highly capital-intensive methods of production because the imported capital goods are obtained cheaply at the overvalued exchange rates. Thus there is a strong incentive to substitute cheaper imported capital goods for domestic labour.

The agricultural and small-scale sectors suffer from foreign exchange and import controls on two counts: *first*, they get imported consumer goods at high prices, and *second*, they fail to obtain the foreign exchange and import permits easily because of red-tapism and corruption prevailing in the LDCs.

The traditional sector also suffers because the government expenditure on public services favours the urban centres as against the rival areas. Public services like transport, communications and electric power are available more readily and at favourable terms to the modern industrial sector than to the traditional sector.

The governments in some of the LDCs have tried to improve credit facilities in the traditional sector by establishing agricultural banks and cooperative credit societies and by passing usuary laws. But these tend to take the form of supplying a limited percentage of subsidised loans through the cooperative societies to some highly favoured 'model villages'. These seemingly impressive 'show pieces' however have no effect on lowering the high rates of interest which prevail in the rest of the traditional sector."

All this has led to malallocation of resources between the modern and the traditional sectors and to obstruction of the development of an integrated domestic capital market in the LDCs. With the multiplicity of government controls, the free market for credit has developed into the black market. Domestic inflation alongwith overvalued exchange rates have led to speculative flight of capital abroad. In countries which have tried to stop this, the capital funds have been channelised into the purchase of gold, jewellery, real estate and into speculative activities. This is because of the cheap money policy which offers low interest rates to the holders of funds for investment purposes. This stands in the way of the growth of an effective capital market.

Government controls over the scarce supply of capital have also retarded the growth of financial intermediaries in the LDCs. These controls favour the large manufacturing units and banks. They discriminate against the small borrowers and the money-lenders who provide credit to the small borrowers. The government believes that capital funds invested only in durable capital goods and modern machinery are productive, while those invested in financing agriculture and trading activities are unproductive.

According to Myint, the efforts made to control the activities of the money-lenders and to provide cheap and easy credit in the traditional sector through commercial banks and cooperative credit societies have failed due to

(*a*) the high overhead costs and salaries of the officials of the commercial banks in rural areas;

(b) the red-tapism in dealing with small borrowers according to the rigid rules of credit worthiness;

(c) the lack of coordination between the head office and branches; and

(d) the supply of limited amounts of subsidised loans through cooperative credit societies to some favoured parts of the rural sector.

Further, credit discrimination against trading activities also stands in the way of the development of an integrated capital market in the LDCs. Due to the non-availability of sufficient capital funds and high costs of holding stocks, the traders have to hold a much lower level of stocks of commodities and circulating capital. As a result, the wholesale and retail prices are widened. Prof. Myint suggests two types of policies to reduce financial dualism in the LDCs.

First, such countries should raise the official interest rates in their organised credit markets high enough to reflect their existing shortage of capital funds. This would encourage the growth of an integrated domestic capital market which can effectively attract savings from within the country and from abroad. It would also help to equate the available supply of savings to the demand for loans including the demand for funds by the money-lenders to be re-lent to the unorganised credit market.

Second, to create a more integrated domestic capital market, free access on equal terms to capital funds should be provided both to the modern and traditional sectors. This would also reduce the malallocation of resources between the two sectors. The interest rates in the traditional sector should be reduced by providing unlimited access to credit funds on equal terms both to the cooperatives and the money-lenders so that they can compete to lower the interest rates for the small borrowers.

CHAPTER

The Dependency Theory of Underdevelopment

INTRODUCTION

The dependency theory states that the dependence of less developed countries (LDCs) on developed countries (DCs) is the main cause for the underdevelopment of the former. This theory of underdevelopment originated in the writings of a few Latin American economists whose translations began to appear in English in the mid-1960s and early 1970s. The prominent among them are Frank, Sunkel, Furtardo, Santos, Emmanuel and Amin.[1] The explanations of *dependencia* given by the various writers differ in degree only. Each tries to pinpoint and specify certain factors which have been responsible for the underdevelopment of LDCs by DCs. So "there is a plurality of dependency views; different meanings are accorded the concept of *dependence*, and different analyses are offered to explain underdevelopment as a result of the interplay between internal and external structures." As there are varieties of dependency theory, we shall briefly discuss the views of the main writers in the form of certain characteristics.

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1. A.G. Frank,*Capitalism and Underdevelopment in Latin America*, 1976, *Dependent, Accumulation and*

Underdevelopment, 1979; O. Sunkel, "National Development Policy and External Dependence in Latin America", *Journal of Development Studies*, Oct. 1969; C. Furtardo,*Development and Underdevelopment*, 1964; Dos Santos, T., "The Structure of Dependence,*A.E.R.*, May 1970; A Emmanuel,*Unequal Exchange*, 1972; Samir Amin, "Underdevelopment and Dependency",*Journal of Modern African Studies* (10), 1972;*Accumulation on a World Scale*, 1975;*Unequal Development*, 1976.

MEANING OF DEPENDENCY

According to the dependency economists, the whole world is divided between two sets of countries: DCs (developed countries) and LDCs (less developed countries). The former are in the*centre* (Western Europe, Britain and the United States) and the latter are in the*periphery*(backward countries of Asia, Africa and Latin America). Frank calls the DCs as*metropolis* and LDCs as*satellite* countries. Others call the former as*dominant* and the latter as*dependent* countries. There are unequal centre periphery relationships whereby LDCs are dependent on DCs in trade, investment, technology, etc. This dependence results in underdevelopment of the periphery because the centre is dominated by the powerful capitalist countries that exploit the former for their benefit.

There is only one specific definition of dependency to be found in the literature on*dependencia.* This is by Dos Santos. According to him, dependency is "a situation in which the economy of certain countries is conditioned by the development and expansion of another economy to which the former is subjected." A dependent relationship between two or more economies is one "when some countries (the dominant ones) can expand and be self-sustaining, while other countries (the dependent ones) can do this only as reflection of that expansion, which can have either a positive or a negative effect on their immediate development."

But there is no unanimity among economists about the meaning of*dependencia* because of differences among them about the relative role of various features of dependence which have caused underdevelopment of LDCs. Sanjay Lall[2] points out in this context : "One sometimes gets the impression on reading the literature that 'dependence' is defined in a circular manner: LDCs are poor because they are dependent, and any characteristics that they display signify dependence." Thus, according to Lall, "in the usage of the*dependencia* school, 'dependence' is meant to describe certain characteristics (economic as well as

social and political) of the economy*as a whole* and is intended to*trace certain processes which are causally* linked to its*underdevelopment* and which are*expected to adversely affect its development in the future*."

THE DEPENDENCY THEORY

Dependency economists belong to different schools of thought and are classified as Marxists, neo-Marxists and structuralists. Todaro classifies them under the Neo-colonial Dependence Model, the False-Paradigm Model and the Dualistic-Development Thesis.[3] But Todaro's categorisation of dependency streams of thought does not include all that is contained in the writings of dependency theorists. Bath and James identity four unifying elements in the views of dependency economists : "(1) Identification of underdevelopment with the expansion of industrial capitalist countries; (2) the view that development and underdevelopment are parts of a unified system; (3) the view that underdevelopment is a persistent natural condition, not a temporary, precapitalist stage; and (4) agreement that dependence affects internal politics, society and culture." Economists have, therefore, tried to explain a single dependency theory, which contains the main views of all the dependency economists in the form of features or characteristics. As such, the dependency theory is explained below in terms of the following characteristics:

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2. Sanjaya Lall, "Is 'Dependence' a Useful Concept in Analysing Underdevelopment?",*World Development*, Vol. 3, 1975.

3. M.P. Todaro,*Economic Development*, 5/e, 1994.

1. DEPENDENCY : A HISTORICAL INTERNATIONAL PROCESS

Dependency theorists like Frank, Santos, Sunkel, Amin and Furtardo hold that the present economic and socio-political conditions prevailing in the periphery are the result of a historical international process. According to Dos Santos, development emerged as global historical phenomenon as a consequence of the formation, expansion and consolidation of the capitalist system, known as dependent capitalism. Both the DCs (developed countries) and LDCs (less developed countries) are integral parts of the capitalist system. But the global

system is such that the development of the centre occurs at the expense of underdevelopment of the periphery. Meier, therefore, characterises underdevelopment of the periphery as the "Siamese twin" of development at the centre. According to Frank, it is the world capitalist system which produced underdevelopment in the past and generated underdevelopment in the present. This has led to what Frank calls "*the development of underdevelopment.*" Frank traces the process of development of underdevelopment at three levels.

At the*First* level, many countries in the periphery have been incorporated into the world economy since the early days of colonialism. At the*second* level, such peripheral countries have become capitalist economies through incorporation into the world economy. At the*third* level, the incorporation of the peripheral countries in the world economy has led to "metropolis-satellite chain" in which the surplus generated at each level in the periphery is successively drawn off the centre. As a result, the periphery is impoverished and the centre is enriched. According to Sanjay Lall, "The development of underdevelopment may be viewed as leading to*immiseration* i.e. the growing poverty of the mass of the population in the periphery."

According to Amin, capitalist relations are introduced in the periphery by the centre. It leads to*dependent development* which is an inappropriate pattern of development imposed upon the periphery by the centre. In such a system, the peripheral economies are without any internal dynamism of their own and are dominated by absentee capitalists of the periphery. "The peripheral country is a mere appendage of the central economy. The development of the centre causes underdevelopment of the periphery and its dependence on the centre."

Todaro calls this the*neo-classical dependencemodel* which "attributes the existence and continuance of third world underdevelopment primarily to the historical evolution of a highly unequal international capitalist system of rich country-poor country relationships."

2. FOREIGN CAPITAL

The peripheral LDCs are heavily dependent on the centre for foreign capital. Foreign capital leads to "external orientation" of LDCs by exporting primary commodities, importing manufactures and making them dependent for industrialisation of their economies. According to Sunkel, it is the stagnation

of agriculture, high concentration of primary commodities for exports, high foreign exchange content of industrialisation and growing fiscal deficit in the peripheral countries which necessitate foreign financing for them. In Sunkel's words: "It is this aspect.... which finally sums up the situation of dependence; this is the crucial point in the mechanism of dependence." The foreign investors exploit LDCs by insisting on the choice of projects, making decisions on pricing, supply of equipments, knowhow and personnel. etc. In fact, they impose a development pattern that is not compatible with local needs. Further, the dependence on foreign capital leads to a much higher outflow in the form of declared profits, royalties, transfer pricing, payment of principal and interest to foreign investors of the centre. Debt service and repayments drain third world wealth. According to Amin, foreign aid stunts agriculture, encourages trade and investment dependencies and reinforces the dominance of exploitative elites of LDCs. Thus foreign investment and aid signify dependence and as a means of exploitation of the periphery by the centre.

3. TECHNOLOGICAL DEPENDENCE

The peripheral countries use excessively capital-intensive technologies imported from the developed countries of the centre. These technologies are inappropriate to the production and consumption needs of LDCs and are sold by multinational corporations (MNCs) of developed countries. The technological dependence of LDCs on DCs arises because of the urgency of importing technologies as they cannot innovate them. They lack information about the availability of appropriate technologies which leads to exploitation of LDCs due to their weak bargaining power. MNCs lead to economic and political distortions in LDCs.

Some of the economic distortions created by MNCs are transfer of technologies to LDCs by restricting their right to use or change or transfer according to their discretion or requirements. This leads to their total technological dependence on MNCs. Capital-intensive technologies have limited labour absorption capacity and thus add to unemployment in LDCs. They create social tensions by worsening the distribution of income. There are large wage differentials between workers employed in the branches of MNCs and those engaged in local firms in LDCs. Such wage differentials increase income inequalities and create social tensions which retard the development of

LDCs.

Both Frank and Santos explain technological development perpetrated my MNCs. The centre has spread its monopoly to the peripheral countries through technological transfer. For this, LDCs have to borrow from the centre. This leads to the repatriation of profits, royalties etc. by MNCs to the centre. This worsens BOP of LDCs. They resort to devaluation and increase in money supply thereby leading to inflation with its resultant adverse effects on the economy. Thus the peripheral countries are caught in a web of dependence structure.

MNCs also create political distortions in the peripheral countries by influencing their internal politics by bribing legislators not only directly but also indirectly. They offer high posts in their local branches to the friends and relatives of the local politicians, bureaucrats and economic oligarchies. They influence laws, politics and foreign policy of LDCs. They also subvert domestic fiscal and monetary policies of host countries.

4. TRADE AND UNEQUAL EXCHANGE

Dependency economists contend that DCs at the centre exploit LDCs of the periphery by forcing them to specialise in the export of primary products with inelastic demand with respect to both price and income. So LDCs "continue to face stagnant export earnings often coupled with disruptive short-term fluctuations in prices." This has created shortage of foreign exchange and BOP deficit in LDCs.

Santos gives two reasons for BOP deficit :

(*a*) DCs keep the prices of their exports to LDCs very high and that of their imports from LDCs very low.

(*b*) Foreign capital from DCs controls major sectors of LDCs with the result that there are large outflows of profit, interest and principal.

Further, trade between the centre (DCs) and the periphery (LDCs) is characterised by*unequal exchange*. Dependency economists attach different meanings to unequal exchange. Neo-Marxists mean by it deterioration in the

terms of trade of peripheral countries. The reason is that “in the centre the incomes of entrepreneurs and productive factors increase more than productivity, whereas in the periphery the increase in income is less than that in productivity.” This is because monopolistic elements in product and factor markets of the centre have allowed them to keep rising factor incomes, whereas the gains in productivity have been distributed in price reductions in the periphery. According to Sutcliffe, unequal exchange means that “exporters in industrialised countries possess more monopoly power than the exporters of underdeveloped countries” thereby leading to unfavourable terms of trade for the latter.

To Emmanuel, it is the differences in techniques of production and differences in wages which lead to unequal exchange in trade between DCs and LDCs. Since wages are low in LDCs, the cost of production of the commodity is also low and so is its price. On the other hand, wages being high in DCs, the cost of production of the commodity is high and so is its price. Thus the commodity of an LDC being cheaper than that of a DC, there is unequal exchange in trade between the two. This is because an LDC exports more of its commodity in order to get a given quantity of imports from a DC.

According to Amin, unequal exchange between the periphery and the centre is due to differences in wages between the two. The wages are higher in the centre due to higher productivity and lower in the periphery due to lower productivity. Since real wages are lower in the periphery (LDCs), the rate of surplus value is higher there. The absentee capitalists of the centre that dominate the periphery’s exporting sector find it profitable to produce and export commodities because of higher rate of surplus value in the periphery. To Amin, dependency is necessary to generate surplus value in the periphery even though it leads to unequal exchange.

5. DUALISM

The notion of dualism is explicit in the views of the dependency theorists. Internationally, the countries are divided into DCs and LDCs (or metropolitan and satellites or centre and periphery). There is also domestic dualism with the coexistence of an advanced imported capitalist system and an indigenous pre-capitalist backward system. The interrelationships between the two systems are

such that the developed region pushes down the underdeveloped region with the result that there is*development of underdevelopment*.

Dualism at the*international plane* leads to the dominance of the centre and dependence of the periphery in the following ways : (*a*) by encouraging the flow of foreign investment and capital-intensive techniques into LDCs through MNCs; (*b*) by controlling scarce raw materials and natural resources in LDCs; (*c*) by encouraging exports of primary products of LDCs and manipulating their prices to DCs own advantage; (*d*) by adopting trade and aid policies against the interests of LDCs and increasing their dependence on DCs; (*e*) by encouraging consumerism through widespread advertisement and exporting; (*f*) by encouraging the elite and rich to study for professional courses in DCs and luring the skilled and professional people to migrate in DCs by offering them high salaries, thus leading to brain drain from LDCs; and (*g*) by perpetuating international dependence of LDCs by "often uninformed, biased, and ethnocentric international expert advisers" from international agencies located in DCs that render "faulty and inappropriate advice" to LDCs. Further, by training university intellectuals, future high-level government economists and other civil servants in developed-country institutions where they are taught "unhealthy alien concept" and "inappropriate theoretical models." Todaro calls this the*False-Paradigm Model* of international dependence.

Within the dependent LDCs, domestic dualism occurs. According to Cardoso, this dualism is due to "an internal structural fragmentation connecting the most advanced parts of their economies to the international capitalist system. Separate although subordinated to these advanced sectors, the backward economic and social sectors of the dependent countries then play the role of internal colonies." Sunkel calls it "internal polarisation". Domestic dualism is characterised by the existence of a modern, capitalist and relatively developed sector producing primary products for export with relatively advance technology on the one side; and isolated, subsistence-based, feudal, or precapitalist and more underdeveloped sector comprising the vast majority of the population on the other side. The modern sector has been importantly affected by intimate economic relations with the centre. Petroleum, mining, plantation and manufacturing industries are controlled and run by MNCs. They exploit the backward, marginal and dependent groups in LDCs. They derive high incomes from their links with the parent MNCs. The consumption patterns

in the advanced urban centres and in foreign-directed enclaves are based on those of DCs. Local elites and some workers in high-income groups are integrated socially and culturally with that of DCs. This reflects social and cultural dependence, besides economic dependence, of LDCs on DCs.

Frank calls this dual society thesis as a*false hypothesis*. According to him, historically the two different sectors of LDCs have been linked closely to the world capitalist system over the past centuries. Capitalism influences the entire economy of an LDC by making its backward regions "internal colonial satellites" of international capitalism and its domestic allies in LDC. It is, therefore, not a fact that the backward rural sector is underdeveloped because it has not been touched and influenced by the capitalist system. In reality, "the capitalist system over the past centuries has effectively and entirely penetrated even the apparently most isolated sectors of the underdeveloped world," according to Frank. Thus underdevelopment is not due to the existence of precapitalist institutions and capital shortage in isolated regions but the result of the very same historical process which generated the development of capitalism itself. Despite the participation of satellite countries in world trade and division of labour, capitalism has led to their underdevelopment.

POLICY IMPLICATIONS OF DEPENDENCY THEORY

Dependency economists have given divergent views to overcome dependency and underdevelopment of peripheral countries.

To overcome dependency, they suggest internal*structural and institutional changes*. Sunkel, in particular, advocates structural changes in all sectors of the economy. Increase in agricultural production through agrarian reforms is necessary to supply farm products at lower prices to other sectors. This will create substantial export surplus when cheap agricultural goods are exported. This will reduce foreign dependence. He suggests diversification and increase in exports, and import substitution. To increase productivity, reduce costs and utilise existing capacity adequately, he advocates industrial concentration of large specialised production units. To reduce dependence on DCs, Sunkel favours mutual cooperation among peripheral countries in the fields of trade, aid, technical assistance and production agreements. Similarly, Santos suggests a qualitative change in the internal production structures and external relations

of LDCs.

All dependency economists lay emphasis on the development of capitalism in the peripheral countries as the main cause for their underdevelopment. So the remedy to overcome underdevelopment is to*adopt a socialist system* in such countries or to*delink or snap ties* with the world capitalist system, according to Frank and Amin. Santos also*favours a popular revolutionary government*.

Other dependency economists advocate*mutual cooperation* among LDCs in the form of regional economic cooperation and international commodity agreements.

Amin, in particular, suggests a*new development strategy* for peripheral countries based on the following : (*a*) a self-reliant development strategy based on one's own resources; (*b*) collective integration of LDCs; and (*c*) the demand for a New International Economic Order based on the transfer of technologies to LDCs, the control of natural resources by LDCs, higher prices for raw materials of LDCs, and access to the markets of DCs for the manufactures of LDCs.

CRITICAL APPRAISAL

The dependency theory focuses on the centre-periphery relationship whereby dependence of the periphery on the centre has resulted in the*development of underdevelopment* of the periphery. It has good explanatory value in explaining the historical causes of their underdevelopment based on the world capitalist system. It highlights how internal socio-economic and political structures of LDCs are influenced by external forces of domination by DCs and perpetuate their underdevelopment.

However, the main views of different dependency economists have been criticised on the following grounds:

1. Not a Complete Theory. There are varieties of dependency theory with a plurality of different views which explain the underdevelopment of the peripheral countries. Thus it is not a coherent, systematic, and complete theory.

2. Does not Explain Development and Underdevelopment. A common

feature of all the dependency economists is that they hold the domination of external forces generated by the centre as the main cause of the underdevelopment of the peripheral countries. But it fails to explain fully how the same external forces generated by capitalism can lead to development of DCs and underdevelopment of LDCs.

3. Ignores Production Relations. Dependency economists explain underdevelopment in terms of exchange or trade relations between the centre and the periphery. But they ignore the problems of forces of production and relations of production in LDCs. Thus their explanation of underdevelopment is one-sided and incomplete.

4. Surplus Product not Explained Fully. According to this theory, it is the exchange of surplus product of LDCs and its appropriation by DCs which causes both development and underdevelopment of the periphery. But it does not throw light on how it is produced and appropriated.

5. Ignores Role of Internal Class Structure. The theory is weak in that it ignores the existence and role of different classes in the production and appropriation of economic surplus. Thus it neglects the role of internal class structure in explaining underdevelopment of LDCs.

6. MNCs Helpful to LDCs. Some dependency economists argue that foreign investment and MNCs exploit LDCs by way of profit remittances, royalties, etc. But this view ignores their contribution to the development of LDCs when they reinvest their profits in increasing production for domestic market and export. Earnings from export help in correcting their BOP deficit.

7. Capitalism not always Harmful. Critics point out that the spread of capitalism in LDCs has led to development rather than underdevelopment of many LDCs. For instance, China was underdeveloped due to political factors, internal disorder, etc. rather than the spread of capitalism. On the other hand, Shanghai, Manchuria and Hong Kong developed due to capitalist penetration. Cuba and East European countries remained underdeveloped due to their political relations with the Soviet Union.

8. Unequal Exchange not the Cause of Underdevelopment. The argument that unequal exchange between DCs and LDCs leads to underdevelopment of

the latter is also weak. Wage differentials as the basis of unequal exchange is not peculiar to trade relations between only DCs and LDCs. They are also found between many DCs which may lead to unequal exchange but not to their underdevelopment.

9. Characteristics of Dependence not Clear. According to Sanjay Lall, characteristics of dependence are not clear. He argues that the characteristics of dependence to be found in LDCs are also to be found in non-dependent economies. They are characteristics of capitalist development in general, not of dependent economies alone. For instance, the dominance of foreign capital does not provide a criterion of dependence because Canada and Belgium are more dependent on it than India or Pakistan, yet they are not in the category of dependent countries.

10. Neglects Market Forces. Griffin and Gurley have criticised the dependency theory for its failure to explain the relationship between the centre and the periphery in terms of the market forces.[4]

11. Weak Empiricially. The dependency theory is weak empirically even through Frank and other dependency economists have tried to base their analyses on the experiences of Latin American countries. But they have not provided data to test the theory. In fact, the theory cannot be tested because it deals with generalities which are often vague.

12. Dependence not Defined Clearly. Sanjay Lall has criticised the dependency economists for not defining the word dependence clearly. According to him, dependence is defined in a circular manner: LDCs are poor because they are dependent and any characteristics that they display signify dependence. In such tautologous definitions, dependency economists are trying to pick off some salient features of modern capitalism as it affects and puts them in a distinct category of dependence. Sanjay Lall concludes that "the concept of dependence as applied to LDCs is impossible to define and cannot be related to a continuance of underdevelopment".

13. Does not Satisfy Two Criteria. Sanjay Lall further opines that a concept of dependence to be useful as a theory must satisfy two criteria : (*i*) It must lay down certain characteristics of dependent economies not found in non-dependent economies; and (*ii*) these characteristic affect adversely the course

and pattern of development of such economies. If crucial features of dependence are found in both dependent and non-dependent economies, the first criterion is not satisfied and the theory is defective. If particular features of dependence are not related causally to underdevelopment, the second criterion is not satisfied and we are faced with the catalogue of socio-economic indicators of underdevelopment rather than with a theory of underdevelopment. Thus the dependency theory fails to satisfy the two criteria laid down by Lall and thus fails as a theory.

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4. K. Griffin and J. Gurley, "Radical Analyses of Imperialism, The Third World and the Trasition to Socialism: A Survey Article,"*Journal of Economic Literature*, Sep. 1985.

EMMANUEL'S THEORY OF UNEQUAL EXCHANGE

Emmanuel in his book*Unequal Exchange: A Study in the Imperialism of Trade* (1970) has propounded the theory of unequal exchange in international trade between the centre (DCs) and the periphery (LDCs) which has led to the exploitation of the latter by the former.

Emmanuel's theory is based on Marx's theory of prices of production for the determination of international process and technological changes in production. He believes that the main reason for economic inequality between DCs and LDCs is the differences in techniques of production and differences in wages which lead to unequal exchange in trade. The product of an hour's labour in a DC is exchanged for the product of more labour hours of an LDC. This unequal exchange brings gain to DC and loss to LDC.

Its Assumptions. Emmanuel's theory is based on the following assumptions :

1. There are two countries: a developed country*A*, and*B* an LDC.

2. There are two different goods*X* and*Y* which are exchanged.

3. Capital is mobile internationally.

4. Labour is not mobile between countries.

5. Prices are high in DC and lower in LDC.

6. Rates of profit are equal in the two countries.

7. Wages are higher in DC and lower in LDC.

8. Wages are given independent of prices.

9. Goods are freely traded.

10. Transport costs are zero.

11. There is a predetermined pattern of international specialisation so that each country specialises in a particular commodity.

Explanation of the Theory. Given these assumptions, Emmanuel believes that LDCs have failed to take advantage of the technological changes for their development. On the others hand, DCs have raised the organic composition of capital through labour-saving technologies. This has led to unequal exchange in trade between them. But the main reason for unequal exchange is the difference between the wage rates of the centre (DCs) and the periphery (LCDs). According to Emmanuel, "Inequality of wages, as such, all other things being equal, is alone the cause of the inequality of exchange."

Unequal exchange occurs when two unequal countries produce two different commodities so that they are not in direct competition with each other. Since wages are low in LDC, the cost of production of the commodity is also low and so is its price. On the other hand, wages being high in DC, the cost of production of the commodity is high and so is its price. Thus the commodity of LDC being cheaper and that of DC being dearer, there is unequal exchange in trade between the two.The reason is that the former country (LDC) exports more of its commodity in order to get a given quantity of imports from the latter country (DC).

Let us illustrate the theory in terms of a numerical example. There are two countries*A* and *B*, country *A* producing good*X* and *B* producing good *Y.* Suppose the wage rate in the developed country A doubles so that it buys 4 units of its each commodity while the wage rate in the less developed country *B* buys 2 units of each. The rate of profit being the same in both the countries, the prices in the two countries are based on a percentage of profit on unit labour

costs (1 +*r*). Thus given the rate of profit, the price equations in the two countries are:

$$P_{Ax} = (1 + r)\,(4P_x + 4P_y)$$

$$P_{By} = (1 + r)\,(2P_x + 2P_y)$$

where P_A and P_B are the two countries, P_x is the price of good *X* and P_y is the price of good *Y*. The relative prices of the countries are $P_{AX} = 2P_{By}$. The less developed low-wage country *B* exports 2 units of the export good *Y* in order to buy 1 unit of its import good *X* from country *A*. Its terms of trade have worsened by 50 per cent. Thus there is unequal exchange whereby the developed country *A* gains at the expense of the less developed country *B*.

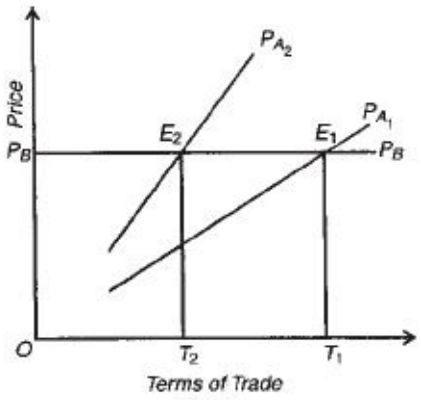

FIG. 1

The theory of unequal exchange is explained in Figure 1 where prices in the two countries are taken on the vertical axis and the terms of trade on the horizontal axis. The price of commodity *Y* in less developed country *B* is taken as $P_B = 1$ which is shown as the horizontal line P_BP_B. The price of commodity *X* in country *A* is shown by the curve P_{A1} so that the equilibrium terms of trade is given by OT_1. An increase in wages and costs leads to the rise in price in country *A* which shifts its price curve to the left as P_{A2}. As a result, the terms of trade of country *B* are reduced to OT_2. Unequal exchange is measured as the difference between the actual terms of trade, OT_1, and the changed terms of trade, OT_2. Thus the terms of trade of country *B* have worsened by T_1T_2.

Its Criticisms. Emmanuel's theory of unequal exchange has been severely criticised by economists on the following grounds :

1. The theory assumes that unequal exchange is the result of wage differences between DCs and LDCs. But it does not explain many factors that

affect wage differences between the two types of countries.

2. Even if it is accepted that wage differences lead to unequal exchange, there can be unequal exchange between DCs because differences in wages are also found among them. So the theory breaks down as it is equally applicable on DCs and not on LDCs alone.

3. If wage differences are in money wages and they are due to differences in labour productivity, the terms of trade of LDCs may not be very bad. If differences in money wages equal differences in productivity in LDCs and DCs, there would be no differences in costs and prices per unit of output. It is only when real wages do not rise as fast as productivity in LDCs as compared to DCs that the terms of trade of LDCs become unfavourable.

4. The theory assumes that the rate of profit is equal in LDCs and DCs. This is an unrealistic assumption because the rate of profit in DCs is always higher because of the capitalist mode of production. Since there is unequal exchange, according to this theory, the rate of profit is bound to increase with the exploitation of LDCs.

5. According to this theory, unequal exchange in trade leads to the exploitation of LDCs by DCs. Economists do not agree with this view of Emmanuel, because unequal exchange has not prevented the growth of LDCs.

6. The theory assumes that capital is mobile within countries. If this is true, then wage differences will be eliminated with the movement of capital from the developed to the less developed country. Thus the theory breaks down.

CHAPTER

The Limits to Growth Model

INTRODUCTION

Since the times of Malthus, Ricardo and Mill, economists like Galbraith, Mishan, Carson, Boulding, Commoner, etc. have voiced their concern about the harmful effects of economic growth on environment. They are of the view that growth has produced pollution and wasteful consumption of trivia that contribute nothing to human happiness. According to them, the objectives of economic growth are to be reviewed because it has negatively affected the quality of life, pollution of the environment, waste of natural resources and its failure to solve socio-economic problems.

In 1968, a group of about seventy five persons belonging to different strata of society from around the world founded the Club of Rome. It believed that the possibilities of continuous growth have been exhausted and timely action is essential in order to avert a planetary collapse. It chose its initial theme "The Predicament of Manking" in June 1970. It commissioned the research by four MIT scientists led by Donald Meadows which was published by the Club of Rome as **The Limits to Growth**[1] in 1972. The second report entitled **Beyond the Limits**[2] was published in 1992 which gave fresh evidences as to how mankind has crossed beyond the limits.

1. D.A. Meadows, D.L. Meadows, J. Randers and W.W. Beherns,*The Limits to Growth* : A Report for the Club of Rome's Project on the Predicament of Mankind, 1972.

THE MODEL

It was Jay Forrester of MIT who in his book **World Dynamics** published in 1971 devised a model that investigates the interplay of such highly aggregated variables as world population, industrial world production, food supply, pollution and natural resources still remaining in the world. Using the "system dynamics" methodology of Forrester, the authors of the Limits to Growth constructed an elaborate computer model of the world. They presented a large and new type of model designed to predict the future development of five global inter-related variables: population, food production, industrial production, non-renewable resources and pollution.

The model is based on the thesis that "the continued growth leads to infinite quantities that just do not fit into a finite world". This basic idea has been elaborated in a highly complicated model which cannot be easily described in equation form. This is because the many relations between the five variables are not rectilinear. The multipliers in question depend on the level of the variables. Among the various relationships, there are "feedback loops" that register the effects of changes in one variable such as food production growth is positively related to food production. But food production is negatively related to pollution, and pollution, in turn, is positively related to industrial output. The model also uses past data on such factors as growth rates of population, industrial output and agricultural production, and the estimates of rates of technological progress. These factors would lead to the use of new resources, raise agricultural productivity and control pollution.

PREDICTIONS OF THE MODEL

The predictions (or conclusions) of the Limits to Growth (LTG) Model are based on its basic thesis that "the continued growth leads to infinite quantities that just do not fit into a finite world". This basic thesis can be analysed as under :

1. The future world population level, food production and industrial

production will first grow exponentially, become increasingly unmanageable and then collapse during the 21st century.

2. The collapse follows because the world economy will reach its physical limits in terms of non-renewable resources, agricultural land and the earth's capacity to absorb excessive pollution which are finite.

3. Eleven vital minerals such as copper, gold, lead, mercury, natural gas, oil, silver, tin and zinc are being exhausted. If, in addition, industrial production continues to increase, that too will give rise to catastrophic results.

4. If the present growth trends in world population, industrialisation, pollution levels, food problem and resource depletion continue unchanged, the limits to growth on this planet will be reached within the next one hundred years. The most probable results will be a rather sudden and incontrollable decline in both population and industrial capacity sometime before the year 2010.

5. Since technological progress cannot expand physical resources infinitely, it would be prudent to put limits on our future growth rather than await the doomsday within the coming 50 or 100 years.

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2. D.A. Meadow, D.L. Meadows and J. Randers, *Beyond the Limits:* Global Collapse or a Sustainable Future, 1992.

6. This catastrophe can be averted by controlling the growth rate of output and population, reducing the pollution levels, and thus achieving *a global equilirium with zero growth.*

Thus the Limits to Growth report developed an interactive simulation model that produced a variety of scenarios which were especially useful for defining what was to be prevented. It stressed that pollution, high population growth rate, and shortage of food and resources make the future prospects of the world bleak which will lead to catastrophic results. Since the resources are finite and are likely to be depleted within 50 or 100 years, people should change their attitude towards the use of resources, their reproduction and pollution levels so as to save the world from collapse.

ITS GRAPHIC EXPLANATION

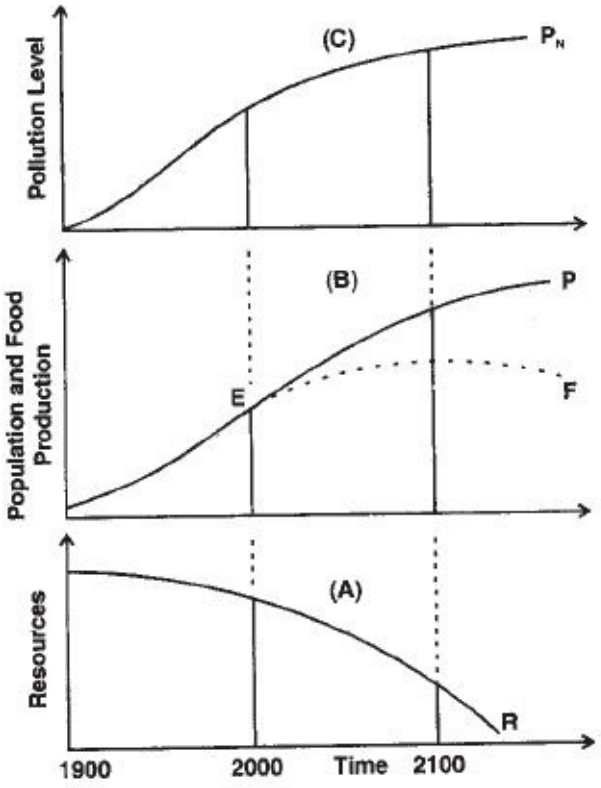

Fig. 1

The Limits to Growth Model is explained in Figure 1 (A), (B) and (C). Time in years is taken on the horizontal axis beginning from the year 1900 to 2100. In Panel (A), resources are measured along the vertical axis and are represented by the downward sloping R curve. Since such resources as oil, natural gas, copper, lead, etc. are fixed, they are being continuously depleted over time from the year 1900 and beyond 2100.

In Panel (B), the growth of population and food supply are measured on the vertical axis and are represented by the P and F curves respectively. They are shown to increase upto point E at the same rate from 1900 to 2100 year. But beyond the year 2000, the population curve P continues to rise, while the food production curve F rises at a diminishing rate and then starts declining by 2100.

In Panel (C), the curve P_N shows the pollution level which continues to rise beyond the year 2010 and if not checked in time, will lead to catastrophic results in the world.

ITS CRITICISMS

The Limits to Growth was an alarming report predicting the collapse of the world economy in the 21 st century. It sold ten million copies in over thirty languages and had considerable impact on economic and political thinking and provided an impetus to antigrowth sentiment.

In fact, the world community was divided into two groups : the resource

pessimists and the resource optimists. The former accepted the predictions of the report and the latter criticised them on the following grounds:

1. Static Reserve Index. The model has been criticised for assuming that the non-renewable resources are scarce and are likely to the exhausted by the year 2100. This perspective is based on the use of the static reserve index (ie. reserve to use ratio) which is the ratio of current reserves to current consumption. The current reserves represent known resources that are economically extractable. The index expresses the number of years until the resources are depleted, given that there will be no additions to the known resources and also the future annual use of the reserves remain at the current level.

But the static reserve index is flawed because it neglects technological development in recyclying and reuse of resources and the possibility of substituting scarce materials for abundant resources. Further, with the discoveries of new deposits of oil, gas, etc., the size of reserves may increase overtime despite their continuing extraction.

2. Technological Development. This model neglects technological developments in resource extraction, use and substitution. In fact, the size of reserves of non-renewable resources has been increasing due to rapid technological development which makes the extraction of sub-economic stocks of resources less expensive. Moreover, scarcity of resources has led to technological developments in new resources such as atomic energy, bio-gas, etc. for industrial and human use. According to Giddens, it is the world of endless change and endless expansion which the LTG report overlooks.

3. Food Production. The model assumes the availability of limited land and consequent decline in food production. According to H. Kahn, whenever certain limits are reached, new technologies are introduced with the passage of time. These technologies effectively either remove the limit or as time passes a subsequent technology can remove the limit. Kahn sees production rising with the invention of new technologies as in the case of the Green Revolution in developing countries which has increased food production and solved their food problem.

4. Population Growth. The model predicted that the world population

growing at an exponential rate would be 7 billion in 2000. If the mortality rate continues to decline without lowering the fertility rate, it will be 14.4 billion in 2030. But the world population has not grown exponentially. It was 6 billion in 2000, as against 7 billion predicted in the model. Highly populated countries like China and India have slowed down their population growth rates by adopting birth control measures. Moreover, empirical studies have shown that economic growth accompanied by rising incomes lowers the fertility rate.

5. Pollution. The model assumes that the level of pollution is increasing exponentially in the world due to growth in agricultural and industrial activities. Consequently, the degradation of environment will adversely affect the quality and existence of human life, and flora and fauna.

No doubt, pollution of the environment is a serious problem, yet both developed and developing countries are trying to bring down pollution levels by using cleaner technologies. So there is no need for pessimism that pollution will bring the doomsday nearer. However, pollution can be reduced by a judicious choice of economic and environmental policies and environmental investments. This is only possible through economic growth rather than by zero economic growth, as the model emphasises.

6. Price System. The LTG model neglects the price system and the dynamics of the market system. The model predicts that unlimited economic growth will lead to the depletion of non-renewable resources. But resource optimist econimists do not agree with this view. According to them, as the scarcity of resources increases, their prices will rise which will, in turn, affect non-renewable resources in different ways : (i) with the rise in their prices, their direct consumption may be reduced ; (ii) the use of high-priced resources in production will fall by substituting techniques that are less intensive in their use ; (iii) high prices of non-renewable resources will encourage the search for new sources such as atomic energy for power generation; (iv) their high prices will provide incentives for the development of substitutes for these resources through new technologies such as bio-gas for power. Thus the efficiency of the market mechanism seems to be one reason why the most gloomy predictions for the depletion of non-renewable resources have failed.

7. Zero Economic Growth. The LTG report suggests a zero rate of economic growth in order to stop the rise in the pollution level. Critics point out that if a

positive rate of growth will lead to doom, a zero grwoth rate will do the same but on a smaller time table. Instead, they argue that economic growth, especially in developing countries, will provide more resources that can be used to reduce pollution by supplying potable water, sanitation facilities, providing better housing facilities and reducing congestion in urban areas. Moreover, economic growth is the only hope for developing countries to bring people out of the vicious circle of poverty and raise their standard of living. Thus the very idea of a zero rate of economic growth is fanciful.

ITS IMPLICATIONS

The following are the implications of the LTG model:

1. The Limits to Growth report highlights the dangers posed by the relentless pursuit of material wealth by the developed countries. It warns readers about the consequences of unconstrained growth by the industrialised countries, depletion of non-renewable resources, deterioration of environment and of population explosion. The report calls forth policy makers, NGOs and the people in general to protect environment, save non-renewal resources and control population.

2. Another important policy prescription of the LTG model is that the governments should voluntarily adopt a zero growth policy. Such a policy would require world redistribution of income and wealth. For zero economic growth, the redistribution of income and wealth both within and between countries would be on a very large scale. It can only be possible by force which would lead to upheavals between the rich and the poor. Moreover, the model fails to explain how redistribution of income and wealth can be effected with zero growth rate.

CONCLUSION

Despite its criticisms, the LTG report is a landmark in pointing out to the world community about the macro effects of economic growth on environment, unlimited exploitation of non-renewable resources and population growth. It lays stress on policies for use and conservation of resources and preservation of environment so as to ensure a better world in the future. The report was a

harbinger of the World Commission on Environment and Development which brought out its seminal report entitled **Our Common Future on Sustainable Development**, the Earth summit at Rio de Janeiro and international protocols at Montreal and Kyoto.

CHAPTER

Myrdal's Theory of Circular Causation

INTRODUCTION

Prof. Gunnar Myrdal maintains that economic development results in a circular causation process whereby the rich are awarded more favours and the efforts of those who lag behind are thwarted. The *backwash effects* predominate and the*spread effects* are dampened. This tends cumulatively to accentuate international inequalities and also leads to regional inequalities within the underdeveloped countries.

In underdeveloped countries*a circular and cumulative process*, also known as the 'vicious circle of poverty,' operates downwards and being unregulated causes increasing inequalities. Myrdal believes that 'our inherited theoretical approach' is inadequate to solve the problem of economic inequalities. "The theory of international trade and, indeed, economic theory generally were never worked out to serve the purpose of explaining the reality of economic underdevelopment and development."[1] The reason is that the traditional economic theory is based on the unrealistic assumption of *stable equilibrium.*Prof. Myrdal believes that it is wrong to apply the notion of stable

equilibrium for constructing a theory to explain the changes in a social system. If, however, we persist in applying the stable equilibrium analysis, then "a change will regularly call forth a reaction in the system in the form of changes which on the whole go in the opposite direction to the first change."[2] "The idea I want to expound in this book," writes Myrdal, "is that, on the contrary, in the normal case there is no such tendency towards automatic self-stabilisation in the social system. The system is not by itself moving towards any sort of balance between forces, but is constantly on the move away from such a situation. In the normal case a change does not call forth countervailing changes but, instead, supporting changes, which move the system in the same direction as the first change but much further. Because of such circular causation a social process tends to become cumulative and often to gather speed at an accelerating rate."[3]

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1. G. Myrdal, *Economic Theory and Underdeveloped Regions*, 1957.

2. *Ibid., p.* 13.

3. *Ibid.*

Another unrealistic assumption which is closely related to the stable equilibrium approach is the *economic factors.* The classical economic theory had its principal shortcoming in disregarding the non-economic factors which "are among the main vehicles for the circular causation in the cumulative processes of economic change." It was due to these two unrealistic assumptions that the traditional theory failed to state the dynamic problems of economic underdevelopment and development.

THE MYRDAL THESIS

Prof. Myrdal builds his theory of economic underdevelopment and development around the idea of regional inequalities on *the national and international* planes. To explain it, he uses the notions of "backwash" and "spread" effects. He defines*backwash effects* as "all relevant adverse changes ... of economic expansion in a locality . . . caused outside that locality. I include under this label the effects *via* migration, capital movements and trade as well as the total cumulated effects resulting from the process of circular causation between all the factors, "non-economic" as well as "economic." The *spread*

effects refer to certain centrifugal "spread effects" of expansionary momentum from the centres of economic expansion to other regions." The main cause of regional inequalities, according to Myrdal, has been the *strong* backwash effects and the *weak* spread effects in underdeveloped countries. We first analyse below the principal forces responsible for this phenomenon at the national level and then at the international level.

(A) REGIONAL INEQUALITIES

The genesis of regional inequalities within a country has a non-economic basis. It is associated with the capitalist system which is guided by the profit motive. The profit motive results in the development of those regions where the expectations of profits are high while other regions remain underdeveloped. Prof. Myrdal attributes this phenomenon to the free play of market forces which tends to increase rather than decrease regional inequalities. He says, "If things were left to market forces unhampered by any policy interferences, industrial production, commerce, banking, insurance, shipping, and indeed, almost all those economic activities which in a developing economy tend to, give a bigger than average return—and, in addition, science, art, literature, education and high culture generally—would cluster in certain localities and regions, leaving the rest of the country more or less in a backwater."[4] In this way, regional inequalities are accentuated when some localities grow at the expense of other regions which stagnate.

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4. *Ibid., p.* 26.

The Backwash Effects of Migration, Capital Movement and Trade. Next, Myrdal analyses the backwash effects of migration, capital movements and trade on the backward regions. .

The localities and regions where economic activity is expanding will attract young and active people from other parts of the country. This will tend to favour the developing region and depress economic activity in the backward region, wherefrom such labour migrates.

Capital movements also tend to increase regional inequalities. In regions which are developed, increased demand will stimulate investment which, in turn, will

increase income and demand, and lead to a second round of investment, and so on. The scope for better investment in the centres of expansion may create capital shortage in the backward regions. “Studies in many countries,” writes Myrdal, “have shown how the banking system, if not regulated to act differently, tends to become an instrument for siphoning off the savings from the poorer regions to the richer and more progressive ones where returns on capital are high and secure.”[5]

Similarly, trade operates with a fundamental bias in favour of the developed regions and in disfavour of the less developed regions. The development of industries in former regions may ruin the existing industries of the backward regions and the poorer regions remain mainly agricultural. According to Myrdal, “The freeing and widening of the markets will often confer such competitive advantages on the industries in established centres of expansion, which usually work under conditions of increasing returns, that even the handicrafts and industries existing earlier in the other regions are thwarted .... As industrialisation is the dynamic force in this development, it is almost tantological to state that the poorer regions remain mainly agricultural ... In these regions also, not only manufacturing industry and other non-agriculture pursuits but agricultural itself show a much lower level of productivity than, in the richer regions.”[6]

The Spread Effects. About the spread effects, Myrdal writes, “Against the backwash effects, there are, however, also certain centrifugal “spread effects” of expansionary momentum from the centres of economic expansion to other regions. It is natural that the whole region around a nodal centre of expansion should gain from the increasing outlets of agricultural products and be stimulated to technical advance all along the line.”[7] There will also be spread effects to localities producing raw materials for the growing industries in the centres and those having consumer goods industries will be stimulated. These will overcome the backwash effects from the older centres and encourage self-expansion of new centres. Similarly, the spread effects flowing from a centre of industrial expansion to other localities and regions, operating through increased demands for their products and in many other ways, weave themselves into the cumulating social process by circular causation.[8]

5. *Ibid., p 28*.

6. *Ibid.,* pp. 28-29.

7. *Ibid.,* p. 31.

8. *Ibid.*

Backwash vs. Spread Effects. It is, however, not possible that the backwash effects and spread effects should be in equilibrium. In support of this, Prof. Myrdal quotes two broad correlations from the studies of the United Nations Economic Commission for Europe:

first, regional inequalities are much wider in the poorer than in the richer countries; and

second, the regional inequalities are increasing in the poorer countries and diminishing in the richer countries. "A large part of the explanation for these two broad correlations may be found in the important fact that the higher the level of economic development that a country has already attained, the stronger the spread effects will usually be." Because the "development is accompanied by improved transportation and communications, higher levels of education and a more dynamic communion of ideas and values—all of which tend to strengthen the forces for the centrifugal spread of economic expansion or to remove the obstacles for its operation." As such economic development becomes an automatic process once a country has reached a high level of development. In contrast, the major cause of the backwardness of underdeveloped countries has been the weaker spread effects and stronger backwash effects whereby in the cumulative process "poverty becomes its own cause."

The Role of the State. National policies have tended to accentuate regional inequalities in poorer countries. The free play of market forces and the *laissez-faire* policy have been the two potent forces in creating regional inequalities in the presence of weaker spread effects. Other factors responsible for regional disparities in the poorer countries have been 'built-in feudal and other inegalitarian institutions and power structures which aid the rich in exploiting the poor.' The governments of underdeveloped countries should therefore, adopt egalitarian policies to weaken the backwash effects and strengthen the spread effects in order to bridge regional inequalities and to strengthen the

foundations for continuous economic progress. In the words of Myrdal, "A higher level of development will strengthen the spread effects and tend to hamper the drift towards regional, inequalities; this will sustain , economic development, and at the same time, create more favourable conditions for policies directed at decreasing regional inequalities still further. The more effectively a national state becomes a welfare state, the stronger will be both the urge and the capacity to counteract the blind market forces which tend to result in regional inequalities; and this, again will spur economic development in the country, and so on, in circular causation."

(B) INTERNATIONAL INEQUALITIES

International trade may have strong backwash effects on the underdeveloped countries, according to Myrdal. At another place he writes, "Trade operates (as a rule) with a fundamental bias in favour of the richer and progressive regions (and continues) and in disfavour of the less developed countries."[9] Unhampered trade between two countries of which one is industrial and the other underdeveloped, strengthens the former and impoverishes the latter. The rich countries have a large base of manufacturing industries with strong spread effects. By exporting their industrial products at cheap rates to underdeveloped countries, they have priced out the small-scale industry and handicrafts of the latter. This has tended to convert the backward countries into the producers of primary products for exports. The demand for primary products being inelastic in the export market, they suffer from excessive price fluctuations. As a result, they are unable to take advantage of either a fall or a rise in the world prices of their exports. The importing countries take advantage of the cheapening of their products because of the inelastic market for their exports. Similar advantages follow when there is any technological improvement in their export production. When the world prices of their products rise, they are again unable to benefit from it. Increased export earnings lead to inflationary pressures, malallocation of investment expenditure and balance of payments difficulties when they are wasted in speculation, conspicuous consumption, real estate, foreign exchange holdings, etc.

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9. G. Myrdal, *Challenge to Affluence*, 1963.

Capital movements have also failed to counteract international inequalities.

Since advanced countries themselves offer to investors both goods, profits and security, capital will shun underdeveloped countries. Capital which flowed to underdeveloped countries under the colonial system was mainly directed towards primary production for exports. But it tended to affect their economies adversely through strong backwash effects. Whatever little was invested by the foreigners in the form of roads, ports, railways, etc. was for political stability and economic profitability of the colonial government. International migration between underdeveloped and developed countries is no longer possible as a solution to the problem of international inequalities.

Thus unhampered trade and capital movement which have led to economic progress in advanced countries have produced strong back wash effects in the underdeveloped countries of the world. "Differences in legislation, administration and *more* generally, in language, in basic values and beliefs, in levels of living, production capacities, and facilities, make national boundaries much more effective barriers to the spread of expansionary momentum than any demarcation lines within one country can be . ... Even more important as impediments to the spread effects of expansionary momentum from abroad than the boundaries and everything they stand for are the very facts of great poverty and weak spread effects within the underdeveloped countries themselves .... Basically, the weak spread effects as between countries are thus for the larger part only a reflection of the weak spread effects within the underdeveloped countries themselves caused by the low level of their development attained. In these circumstances market forces will tend cumulatively to accentuate international inequalities."

A CRITICAL APPRAISAL

The Myrdal thesis marks an important departure from other theories of underdevelopment. He beautifully combines national and international forces which have tended, to keep the underdeveloped countries of the world in the cumulative process where 'poverty becomes its own cause.' There is no denying the fact that in underdeveloped countries the spread effects are dampened by the strong backwash effects. National and international forces tend to perpetuate them and thus accentuate regional and world inequalities. Moreover, the free play of market forces and unhampered trade have tended to cramp the export potential of such countries. As a result, a *Great Gap* has

developed between imports and exports of underdeveloped countries which has made their economic development a costly and lengthy affair. Even empirical evidence indicates that the Myrdal thesis has been vindicated.

PART - III
SOME GROWTH MODELS

CHAPTER

The Harrod-Domar Models

INTRODUCTION

The Harrod-Domar models of economic growth are based on the experiences of advanced economies. They are primarily addressed to an advanced capitalist economy and attempt to analyse the requirements of steady growth in such economy.

REQUIREMENTS OF STEADY GROWTH

Both Harrod and Domar are interested in discovering the rate of income growth necessary for a smooth and uninterrupted working of the economy. Though their models differ in details, yet they arrive at similar conclusions.

Harrod and Domar assign a key role to investment in the process of economic growth. But they lay emphasis on the dual character of investment. *Firstly,* it creates income, and *secondly,* it augments the productive capacity of the economy by increasing its capital stock. The former may be regarded as the '*demand effect*' and the latter the '*supply effect*' of investment. Hence so long as net investment is taking place, real income and output will continue to expand. However, for maintaining a full employment equilibrium level of income from year to year, it is necessary that both real income and output

should expand at the same rate at which the productive capacity of the capital stock is expanding. Otherwise, any divergence between the two will lead to excess or idle capacity, thus forcing entrepreneurs to curtail their investment expenditures. Ultimately, it will adversely affect the economy by lowering incomes and employment in the subsequent periods and moving the economy off the equilibrium path of steady growth. Thus, if full employment is to be maintained in the long run, net investment should expand continuously. This further requires continuous growth in real income at a rate sufficient enough to ensure full capacity use of a growing stock of capital. This required rate of income growth may be called the *warranted rate of growth* or "the full capacity growth rate."

ASSUMPTIONS

The models constructed by Harrod and Domar are based on the following assumptions:

(1) There is an initial full employment equilibrium level of income.

(2) There is the absence of government interference.

(3) These models operate in a closed economy which has no foreign trade.

(4) There are no lags in adjustments between investment and creation of productive capacity.

(5) The average propensity to save is equal to the marginal propensity to save.

(6) The marginal propensity to save remains constant.

(7) The capital coefficient, *i.e.*, the ratio of capital stock to income is assumed to be fixed.

(8) There is no depreciation of capital goods which are assumed to possess infinite life.

(9) Saving and investment relate to the income of the same year.

(10) The general price level is constant, *i.e.*, the money income and real

income are the same.

(11) There are no changes in interest rates.

(12) There is a fixed proportion of capital and labour in the productive process.

(13) Fixed and circulating capital are lumped together under capital.

(14) There is only one type of product.

All these assumptions are not necessary for the final solution of the problem, nevertheless they serve the purpose of simplifying the analysis.

THE DOMAR MODEL

Domar [1] builds his model around the following question: since investment generates income on the one hand and increases productive capacity on the other at *what rate investment should increase in order to make the increase in income equal to the increase in productive capacity, so that full employment is maintained?*

He answers this question by forging a link between aggregate supply and aggregate demand through investment.

Increase in Productive Capacity. Domar explains the *supply* side like this. Let the annual rate of investment be *I,* and the annual productive capacity per dollar of newly created capital be equal on the average to *s* (which represents the ratio of increase in real income or output to an increase in capital or the reciprocal of the accelerator or the marginal capital-output ratio). Thus the productive capacity of *I* dollar invested will be *I. s* dollars per year.

But some new investment will be at the expense of the old. It will, therefore, compete with the latter for labour markets and other factors of production. As a result, the output of old plants will be curtailed and the increase in the annual output (productive capacity) of the economy will be somewhat less than *I.s.* This can be indicated as *I* σ, where σ (sigma) represents the net potential social *average productivity of investment* (= Δ *Y/I).* Accordingly *I*σ is less than *I.s. I*σ

is the total net *potential increase in output* of the economy and is known as the *sigma* effect. In Domar's words, this "is the increase in output which the economy can produce," it is the "supply side of our system."

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1. Evsey Domar, "Expansion and employment" in *A.E.R.*, March 1947, and *Essays on the Theory of Economic Growth*, 1957.

Required Increase in Aggregate Demand. The *demand* side is explained by the Keynesian multiplier. Let the annual increase in income be denoted by ΔY and the increase in investment by ΔI and the propensity to save by α(alpha) (= $\Delta S/\Delta Y$). Then the increase in income will be equal to the multiplier (1/ α) times the increase in investment:

$$\Delta Y = \Delta I \frac{1}{\alpha}$$

Equilibrium. To maintain full employment equilibrium level of income, aggregate demand should be equal to aggregate supply. Thus we arrive at the *fundamental equation* of the model:

$$\Delta I \frac{1}{\alpha} = I\alpha$$

Solving this equation by dividing both sides by I and multiplying by α we get:

$$\frac{\Delta I}{I} = \alpha\sigma$$

This equation shows that to maintain full employment, the growth rate of *net autonomous investment* ($\Delta I/I$) must be equal to ασ (the MPS times the productivity of capital). This is the rate at which investment must grow to assure the use of potential capacity in order to maintain a steady growth rate of the economy at full employment.

Domar gives a numerical example to explain his point: Let σ =25 per cent per year, α =12 per cent and Y =150 billion dollars per year. If full employment is to be maintained, an amount equal to 150 ×12/100 =18 billion dollars should be invested. This will raise productive capacity by the amount invested σ times, *i.e.*, by 150 × 12/100 × 25/100 = 4.5 billion dollars, and the national income will have to rise by the same amount. But the relative rise in income will equal

the absolute increase divided by the income itself, *i.e.*,

$$150 \times \frac{\frac{12}{100} \times \frac{25}{100}}{150} = \frac{12}{100} \times \frac{25}{100} = \alpha\sigma = 3 \text{ per cent}$$

Thus in order to maintain full employment, income must grow at the rate of 3 per cent per annum. This is the equilibrium rate of growth. Any divergence from this **golden path** will lead to cyclical fluctuations. When $\Delta I/I$ is greater than $\alpha\sigma$, the economy would experience boom and when $\Delta I/I$ is less than $\alpha\sigma$, it would suffer from depression.

THE HARROD MODEL

R.F. Harrod [2] tries to show in his model how steady *(i.e.,* equilibrium) growth may occur in the economy. Once the steady growth rate is interrupted and the economy falls into disequilibrium, cumulative forces tend to perpetuate this divergence, thereby leading to either secular deflation or secular inflation.

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2. R.F. Harrod, *Towards a Dynamic Economics,* 1948.

The Harrod model is based upon three distinct rates of growth.*First,* there is the *actual growth rate* represented by G which is determined by the saving ratio and the capital-output ratio. It shows short-run cyclical variations in the rate of growth. *Second,*there is the *warranted growth rate* represented by *Gw* which is the full capacity growth rate of income of an economy. *Third,* there is the *natural growth rate* represented by *Gn*which is regarded as 'the welfare optimum' by Harrod. It may also be called the potential or the full employment rate of growth.

The Actual Growth Rate. In the Harrodian model the first fundamental equation is:

$$GC = s \qquad \ldots(1)$$

where *G* is the rate of growth of output in a given period of time and can be expressed as $\Delta Y/Y$; *C* is the net addition to capital and is defined as the ratio of investment to the increase in income, *i.e.*, $I / \Delta Y$ and s is the average

propensity to save, *i.e., S/Y.* Substituting these ratios in the above equation we get:

$$\frac{\Delta Y}{Y} \times \frac{I}{\Delta Y} = \frac{S}{Y} \text{ or } \frac{I}{Y} = \frac{S}{Y} \text{ or } I = S$$

The equation is simply a re-statement of the truism that ex-post (actual, realized) savings equal ex-post investment.

The above relationship is disclosed by the behaviour of income. Whereas *S* depends on *Y*, *I* depends on the increment in income (Δ*Y*), the latter is nothing but the acceleration principle.

The Warranted Rate of Growth. The warranted rate of growth is, according to Harrod, the rate "at which producers will be content with what they are doing." It is the "entrepreneurial equilibrium; it is the line of advance which, if achieved, will satisfy profit takers that they have done the right thing." Thus this growth rate is primarily related to the behaviour of businessmen. At the warranted rate of growth, demand is high enough for businessmen to sell what they have produced and they will continue to produce at the same percentage rate of growth. Thus, it is the path on which the supply and demand for goods and services will remain in equilibrium, given the propensity to save. The equation for the warranted rate is

$$Gw Cr = s \qquad \ldots(2)$$

where *Gw* is the warranted rate of growth or the full capacity rate of growth of income which will fully utilize a growing stock of capital that will satisfy the entrepreneurs with the amount of investment actually made. It is the *value* of Δ*Y/Y. Cr,* the capital requirements, denotes the amount of capital needed to maintain the warranted rate of growth, *i.e.,* required capital-output ratio. It is the *value* of *I*/Δ *Y,* or *C* and *s* is the same as in the first equation, *i.e., S/Y.*

The equation, therefore, states that if the economy is to advance at the steady rate of *Gw* that will fully utilize its capacity, income must grow at the rate of *s/Cr* per year, i.e., *Gw=s/Cr.*

If income grows at the warranted rate, the capital stock of the economy will be fully utilised and entrepreneurs will be willing to continue to invest the amount

of saving generated at full potential income. *Gw* is therefore a self-sustaining rate of growth and if the economy continues to grow at this rate, it will follow the equilibrium path.

Genesis of Long-run Disequilibria. For full employment growth, the actual growth rate *G* must equal *Gw*, the warranted rate of growth that would give steady advance to the economy, and *C* (the actual capital goods) must equal *Cr* (the required capital goods for steady growth).

If *G* and *Gw* are not equal, the economy will be in disequilibrium. For instance, if *G* exceeds *Gw*, then *C* will be less than *Cr*. When *G>Gw*, shortages result. There will be insufficient goods in the pipeline and/or insufficient equipment. Such a situation leads to *secular inflation* because actual income grows at a faster rate than that allowed by the growth in the productive capacity of the economy. It will further lead to a deficiency of capital goods, the actual amount of capital goods being less than the required capital goods *(C<Cr)*. Under the circumstances, desired *(ex-ante)* investment would be greater than saving and aggregate production would fall short of aggregate demand. There would thus be *chronic inflation*. This is illustrated in Fig. 1 (A) where the growth rates of income are taken on the vertical axis and time on the horizontal axis. Starting from the initial full employment level of income Y_0, the actual growth rate *G* follows the warranted growth path *Gw* up to point *E* through period t_2. But from t_2 onward *G* deviates from *Gw* and is higher than the latter. In subsequent periods, the deviation between the two becomes larger and larger.

If, on the other hand, *G* is less that *Gw*, then *C* is greater than *Cr*. Such a situation leads to *secular depression* because actual income grows more slowly than what is required by the productive capacity of the economy leading to an excess of capital goods *(C>Cr)*. This means that desired investment is less than saving and that the aggregate demand falls short of aggregate supply. The result is fall in output, employment, and income. There would thus be chronic depression. This is illustrated in Fig. 1 (B) when from period t_2 onward *G* falls below *Gw* and the two continue to deviate further away.

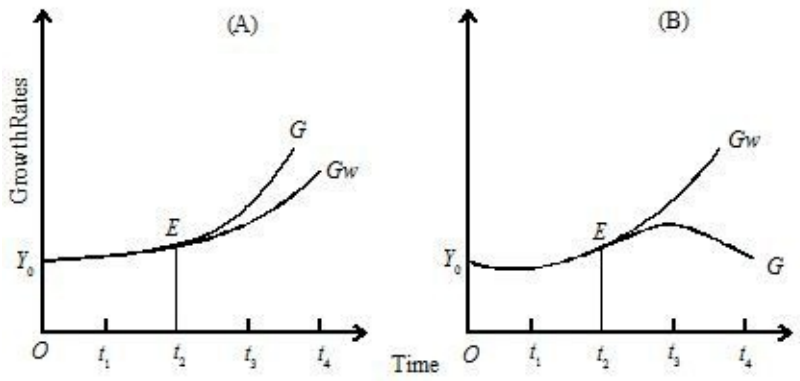

Fig. 1.

Harrod states that once *G* departs from *Gw,*it will depart further and further away from equilibrium. He writes: "Around that line of advance which if adhered to would alone give satisfaction centrifugal forces are at work, causing the system to depart further and further from the required line of advance." Thus the equilibrium between *G* and *Gw* is a *knife-edge equilibrium.* For once it is disturbed, it is not self-correcting. It follows that one of the major tasks of public policy is to bring *G* and *Gw* together in order to maintain long-run stability. For this purpose, Harrod introduces his third concept of the natural rate of growth.

The Natural Rate of Growth. The natural rate of growth is the rate of advance which the increase of population and technological improvements allow. It depends on the macro variables like population, technology, natural resources and capital equipment. In other words, it is the rate of increase in output at full employment as determined by a growing population and the rate of technological progress. The equation for the natural rate of growth is

$$Gn.\ Cr = \text{or } \#\ s$$

Here *Gn* is the *natural* or *full employment* rate of growth.

Divergence of *G, Gw* **and** *Gn.* Now for full employment equilibrium growth *Gn=Gw = G.* But this is a *knife-edge* balance. For once there is any divergence between natural, warranted and actual rates of growth conditions of secular stagnation or inflation would be generated in the economy. If *G>Gw,* investment increases faster than saving and income rises faster than *Gw.* If *G<Gw,* saving increases faster than investment and rise of income is less than

Gw. Thus Harrod points out that if *Gw>Gn, secular stagnation* will develop. In such a situation, *Gw* is also greater than *G* because the upper limit to the actual rate is set by the natural rate as shown in Fig.2(A). When *Gw* exceeds *Gn, C > Cr* and there is an excess of capital goods due to a shortage of labour. The shortage of labour keeps the rate of increase in output to a level less than *Gw.* Machines become idle and there is excess capacity. This further dampens investment, output, employment and income. Thus the economy will be in the grip of chronic depression. Under such conditions saving is a *vice*.

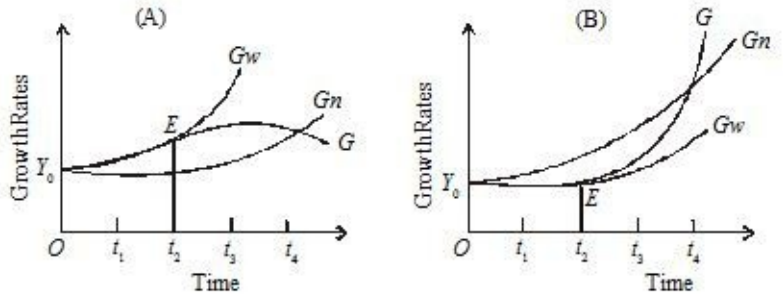

Fig. 2.

If *Gw<Gn, Gw* is also less than *G* as shown in Fig. 2(B). The tendency is for *secular inflation* to develop in the economy. When *Gw* is less than *Gn, C< Cr.* There is a shortage of capital goods and labour is plentiful. Profits are high since desired investment is greater than realised investment and the businessmen have a tendency to increase their capital stock. This will lead to secular inflation. In such a situation saving is a *virtue* for it permits the warranted rate to increase.

This instability in Harrod's model is due to the rigidity of its basic assumptions. They are a fixed production function, a fixed saving ratio, and a fixed growth rate of labour force. Economists have attempted to relieve this rigidity by permitting capital and labour substitution in the production function, by making the saving ratio a function of the profit rate and the growth rate of labour force as a variable in the growth process.

The *policy implications* of the model are that saving is a virtue in any inflationary gap economy and vice in a deflationary gap economy. Thus in an advanced economy, *s* has to be moved up or down as the situation demands.

A COMPARATIVE STUDY OF THE TWO MODELS

Points of Similarity. The following are the points of similarity in the two models.

The Domar Model		The Harrod Model	
$\sigma = \frac{\Delta Y}{I}$	$\frac{\Delta I}{I} = \alpha\sigma$	$GC = s$	$G = \frac{\Delta Y}{Y}$
$\alpha = \frac{\Delta S}{\Delta Y}$	$\frac{\Delta I}{I} = \frac{\Delta S}{Y} \times \frac{\Delta Y}{I}$	or $\frac{\Delta Y}{Y} \times \frac{I}{\Delta Y} = \frac{S}{Y}$	$C = \frac{I}{\Delta Y}$
	$\frac{\Delta I}{I} = \frac{\Delta S}{I}$	$= \frac{I}{Y} = \frac{S}{Y}$	$s = \frac{S}{Y}$
	or $\Delta I = \Delta S$	or $I = S$	

Given the capital-output ratio, as long as the average propensity to save is equal to the marginal propensity to save, the equality of saving and investment fulfils the conditions of equilibrium rate of growth.

Looked at from another angle, the two models are similar. Harrod's *s* is Domar's α. Harrod's warranted rate of growth (*Gw*) is Domar's full employment rate of growth (ασ). Harrod's *Gw = s/Cr* ≡Domar's ασ.

To prove it $\alpha = \frac{S}{Y}$ or $S = \alpha Y$ ...(1)

$\sigma = \frac{\Delta Y}{I}$ or $\Delta Y = I\alpha$ ...(2)

Since *S = I*, and substituting *S* for *I* in equation (2), we have

$\Delta Y = \alpha Y \sigma$ $[\because S = \alpha Y]$

or $\frac{\Delta Y}{Y} = \alpha\sigma$ ...(3)

$\therefore$ $Gw = \alpha\sigma$ $\left(\text{Since } Gw = \frac{\Delta Y}{Y}\right)$

We have proved mathematically that Harrod's *Gw* is the same as Domar's ασ. But, in reality, Domar's rate of growth α *s* is Harrod's *Gw,* and Domar's ασ is Harrod's *Gn*. In Domar's model, *s* is the annual productive capacity of newly created capital which is greater than σ which is the net potential social average

productivity of investment. It is the lack of labour and other factors of production which reduces Domar's growth rate from α s to ασ. Since labour is involved in σ, therefore Domar's potential growth rate resembles Horrod's natural rate. We may also say that the excess of *s* over σ in Domar's model expresses the devise of *Gw* over *Gn* in Harrod's model.

Points of Difference. There are, however, important differences in the two models.

(1) Domar assigns a key role to investment in the process of growth and emphasises on its dual character. But Harrod regards the level of income as the most important factor in the growth process. Whereas Domar forges a link between demand and supply of investment. Harrod, on the other hand, equates demand and supply of saving.

(2) The Domar model is based on one growth rate ασ. But Harrod uses three distinct rates of growth: the actual rate (*G*), the warranted rate (*Gw*) and the natural rate (*Gn*).

(3) Domar uses the reciprocal of marginal capital-output ratio, while Harrod uses the marginal capital-output ratio. In this sense Domar's σ= *I*/ *Cr* of Harrod.

(4) Domar gives expression to the multiplier but Harrod uses the accelerator about which Domar appears to say nothing.

(5) The formal identity of Harrod's *Gw* equation and Domar's equation is maintained by Domar's assumption that Δ I/I = Δ *Y/Y.* But Harrod does not make such assumptions. In Harrod's equilibrium equation *Gw = s/Cr*, there is neither any explicit or implicit reference to Δ*I* or *I*. It is, however, in his basic equation *G=s/C* that there is an implicit reference to *I,* since *C* is defined as *I*/Δ *Y*. But there is no explicit or implicit reference to Δ*I*.

(6) For Harrod the business cycle is an integral part of the path of growth and for Domar it is not so but is accommodated in his model by allowing σ(average productivity of investment) to fluctuate.

(7) While Domar demonstrates the technological relationship between capital

accumulation and subsequent full capacity growth in output, Harrod shows in addition a behavioural relationship between rise in demand and hence in current output on the one hand, and capital accumulation on the other. In other words, the former does not suggest any behaviour pattern for entrepreneurs and the proper change in investment comes exogenously, whereas the latter assumes a behaviour pattern for entrepreneurs that induces the proper change in investment.

LIMITATIONS OF THESE MODELS

Some of the conclusions depend on the crucial assumptions made by Harrod and Domar which make these models unrealistic:

(l) The propensity to save (α or *s*) and the capital-output ratio (σ) are assumed to be constant. In actuality, they are likely to change in the long run and thus modify the requirements for steady growth. A steady rate of growth can, however, be maintained without this assumption. As Domar himself writes, "This assumption is not necessary for the argument and that the whole problem can be easily reworked with variable α and σ."

(2) The assumption that labour and capital are used in fixed proportions is untenable. Generally, labour can be substituted for capital and the economy can move more smoothly towards a path of steady growth. Infact, unlike Harrod's model, this path is not so unstable that the economy should experience chronic inflation or unemployment if *G* does not coincide with *Gw.*

(3) The two models also fail to consider changes in the general price level. Price changes always occur over time and may stabilize otherwise unstable situations. According to Meier and Baldwin, "If allowance is made for price changes and variable proportions in production, then the system may have much stronger stability than the Harrod model suggests."

(4) The assumption that there are no changes in interest rates is irrelevant to the analysis. Interest rates change and affect investment. A reduction in interest rates during periods of overproduction can make capital-intensive processes more profitable by increasing the demand for capital and thereby reduce excess supplies of goods.

(5) The Harrod-Domar models ignore the effect of government programmes on economic growth. If, for instance, the government undertakes a programmes of development, the Harrod-Domar analysis does not provide us with causal (functional) relationship.

(6) It also neglects the entrepreneurial behaviour which actually determines the warranted growth rate in the economy. This makes the concept of the warranted growth rate unrealistic.

(7) The Harrod-Domar models have been criticised for their failure to draw a distinction between capital goods and consumer goods.

(8) According to Professor Rose, the primary source of instability in Harrod's system lies in the effect of excess demand or supply on production decisions and not in the effect of growing capital shortage or redundancy on investment decisions.

Conclusion. Despite these limitations, "Harrod-Domar growth models are purely *laissez-faire* ones based on the assumption of fiscal neutrality and designed to indicate conditions of progressive equilibrium for an advanced economy." They are important "because they represent a stimulating attempt to dynamize and secularise Keynes' static short-run saving and investment theory," according to Kurihara.

APPLICATION OF HARROD-DOMAR MODELS TO UNDERDEVELOPED COUNTRIES

Growth theory in advanced economies has been associated with three principal concepts: the saving function, autonomous vs induced investment, and the productivity of capital. The Harrod-Domar models are based on these concepts and were primarily developed in order to illuminate secular stagnation that was threatening the advanced economies in the post-war period. The application of these models has now been extended to the development problems of underdeveloped economies. As Hirschman writes: "The Domar model, in particular, has proved to be remarkably versatile, it permits us to show not only the rate at which the economy must grow if it is to make full use or the capacity created by new investment but inversely, the required savings and the capital-output ratios if income is to attain a certain target growth rate.

In such exercises, the capital-output ratio is usually assumed at some value between 2.5 and 5; sometimes several alternative projections are undertaken; with given growth rates, overall or per capita, and with given population projections, in the latter case, total capital requirements for five- or ten-year plans are then easily derived." [3]Let us see, how these models can be used for planning of underdeveloped countries.

Suppose the capital-output ratio is assumed to be 4:1 and the full capacity growth rate or the warranted growth rate is estimated at 3 per cent per annum for the economy. By applying either the Harrod or the Domar formula, the planners can find out the saving-income ratio required to sustain the growth rate of 3 per cent per annum.

In Harrod's model:

Gw.Cr=s and by applying the assumed rates we get,

3/100 × 4/1=12/100 or 12 per cent which is the saving-income ratio. Similarly, in Domar's model:

Δ Y/Y= ασ = 3/100 × 4/1 = 12/100 or 12 per cent (σ being the reciprocal of Harrod's *Cr).*

Thus, if the capital-output ratio is assumed as 4: 1 in an economy, the community will have to save 12 per cent of its annual income, if its annual growth rate of output is to be 3 per cent. Let us work it out in practice. Given the saving ratio and the capital-output ratio, the Harrod formula for calculating the growth rate is

Gw=s/Cr

If s is 12 per cent and the value of *Cr* 4, then

Gw=12 /4 =3 per cent.

Sir Roy Harrod in the *Second Essay* in *Dynamic Theory* has tried to make his model more applicable to underdeveloped countries. He has elaborated the supply side of his fundamental equation by introducing the role of interest rate

in determining the supply of savings and the demand for savings. The natural rate of interest *rn* defined as the ratio of the natural growth rate of *per capita output*, *Pc* and *the natural growth rate of income*, *Gn* to the elasticity of diminishing utility of income *e*.Thus

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3. A.O. Harschman, *op. cit.*, pp. 31-32.

$$rn = \frac{Pc.Gn}{e}$$

Taking the values of *Pc* and *Gn* as given, the natural rate of interest depends on the value of *e* which is assumed to be less than unity, *rn* and *e* are inversely related to each other. When *e* is small, *rn* is high and vice versa.

The capital requirements, *Cr,*depend on the rate of interest, *Cr=f(rn).*Rather, *Cr* is a decreasing function of *rn.* The higher the rate of interest, the lower the capital requirements, and vice versa.

The savings requirements *Sr*, like *Cr*, are also of much importance in underdeveloped countries. But the average propensity to save *s* is not necessarily equal to social requirements of savings, *Sr*. The actual savings *S* may be greater or less than *Sr, i.e., S = Sr.* If *S>Sr* then *Gw> Gn* which means that actual savings being larger in the community, entrepreneurs would desire to invest more. In the long run, however, *Gw* cannot continue to be greater than *Gn* which is the highest growth rate that can be attained. In such a situation, the actual growth rate would attain full employment and will be less than *Gw, i.e., G<Gw.* This will lead to depression in the economy. On the contrary, if *S<Sr,* then *Gw<Gn.* It implies that actual savings being less than the required savings in the community, there would be fall in investment. In the long run, it would lead to a fall in the warranted growth rate below the actual growth rate, *i.e., Gw<G* and the level of investment would increase. Ultimately there will be chronic inflation.

Since low savings, high level of investment and chronic inflation are some of the features of underdeveloped countries, Harrod suggests the financing of large investments through the expansion of bank credit and automatic investment of inflationary profits in the capital markets. But there are no organised capital markets in such economies. Therefore, expansion of bank

credit is the only way to finance investments and generate economic growth. Low savings in an underdeveloped country are responsible for its low rate of growth and the existence of mass unemployment and underemployment. Thus the actual level of savings should be raised to the level of required rate of savings by a compulsory levy or a surplus budget so that $S = Sr$. Besides, Harrod also emphasizes the need for changes in the social and institutional factors in such economies. For social and institutional obstacles may be the cause of a low growth rate rather than the lack of savings in underdeveloped countries. Under the circumstances, *Sr* will also be low and *S* may approximate to it.

LIMITATIONS OF THESE MODELS FROM THE STANDPOINT OF UNDERDEVELOPED COUNTRIES

The Harrod-Domar models are not applicable to underdeveloped countries for the following reasons:

1. Different Conditions. The Hariod-Domar analysis was evolved under different set of conditions. It was meant to prevent an advanced economy from the possible effects of secular stagnation. It was never intended to guide industrialization programmes in underdeveloped economies. The limitations of these growth models as applied to such economies, therefore, stem from this fact.

2. Saving Ratio. These growth models are characterized by a high saving ratio and a high capital- output ratio. In an underdeveloped economy, however, decisions to save and invest are generally undertaken by the same group of persons. The vast majority of the people live on the margin of subsistence and thus very few are in a position to save.

3. Capital-Output Ratio. Similarly, it is difficult to have a correct estimate of the capital-output ratio where normal productivity is often inhibited by shortages and bottlenecks. When they are removed, there is considerable increase in the productivity of already invested capital. Such an economy, therefore, would have either to increase its saving ratio or capital-output ratio by improving methods of production arid removing the various obstacles to investment. Prof. Hirschman is of the view their the ‘predictive and operational

value' of a model based on the propensity to save and on the capital-output ratio is low and is bound to be far less useful in underdeveloped than in advanced economies.

4. Structural Unemployment. According to Prof. Kurihara, the Harrod-Domar growth rate of investment fails to solve the problem of structural unemployment to be found in underdeveloped countries. It can tackle the problem of 'Keynesian unemployment' arising out of deficiency of effective demand or due to under-utilization of capital. But when population grows faster than accumulation of capital in an underdeveloped country, structural unemployment will arise due to lack of capital equipment.

5. Disguised Unemployment. These models start with the full employment level of-income but such a level is not found in underdeveloped countries. There exists disguised unemployment in such countries which cannot be removed by the methods suggested by Harrod-Domar. Thus the main assumption of the Harrod-Domar models being absent in underdeveloped countries, these models are not applicable to them.

6. Government Intervention. The Harrod-Domar models are based on the assumption that there is no government intervention in economic activities. This assumption in not applicable to underdeveloped countries because they cannot develop without government help. In such countries, the role of the state as 'pioneer entrepreneur' in starting large industries and in regulating and directing private enterprise has been increasingly recognised.

7. Foreign Trade and Aid. The Harrod-Domar models are based on the assumption of a closed economy. But underdeveloped countries are open rather than closed economies where foreign trade and aid play very crucial roles in their economic development. Both these factors are the bases of their economic progress.

8. Price Changes. These models are based on the unrealistic assumption of a constant price level. But in underdeveloped countries price changes are inevitable with development.

9. Institutional Changes. Institutional factors have been assumed to be given in these models. But the reality is that economic development is not possible

without institutional changes in such countries. Therefore, these models fail to apply in underdeveloped countries.

Conclusion. Thus it appears from the above discussion that the Harrod-Domar models, based as they are on unrealistic assumptions, have little practical application in underdeveloped countries, Hirschman, therefore, suggests that "economics of development, like the underdeveloped countries themselves, must learn to walk on its own feet, that is, it must work out its own abstractions. [4]

4. Hirschman,*op. dt.,* p. 33. Professor S. Chakravarty in his book,*The Logicof lnvestment Planning,* (p. 43), regards these models as a very rough tool in itself and not too much should be expected from it. The great service that these models perform is to indicate very roughly the dimensions of the problem involved in raising the per capita income level in an underdeveloped country. Their highly aggregative nature, however, prevents them from being used as a tool in detailed quantitative policy making and conceals many structural aspects of the problem of a steady rate of growth.

But Kurihara is of the view that though "their policy implications are very opposite of what one might expect of an underdeveloped economy," yet "the growth models have this positive lesson for underdeveloped economies, that the state should be allowed to play not only a stabilizing role but also a development role, if these economies are to industrialize more effectively and rapidly than the now industrialized economies did in conditions of laissez-faire." He further opines that because of the universal character of saving-income ratio and capital-output ratio (or its reciprocal) as measurable strategic variables, the growth mechanism discussed by Harrod and Domar is applicable to all economic systems, albeit with due modification. That is why, these growth models are applicable to those underdeveloped countries in which the technique of planning with 'balanced growth' is adopted because under this technique saving-income ratio and capital-output ratio remain constant during the plan period. [5]

5. Kurihara, *op. cit.,* Chapters 9 and 11.

CHAPTER

The Kaldor Model of Distribution

THE KALDOR MODEL

The Kaldor model [1] is an attempt to make the saving-income ratio a variable in the growth process. It is based on the 'classical saving function' which implies that saving equals the ratio of profits to national income, *i.e.*, $S = P/Y$.

Assumptions. Kaldor builds his model on the following assumptions:

(1) There is a state of full employment so that total output or income (Y) is given.

(2) National income or output consists of wages (W) and profits *(P)* only. W comprises both manual labour and salaries, while P includes the income of property owners and of entrepreneurs.

(3) The marginal propensity to consume of workers is greater than that of capitalists whereby the marginal propensity to save of the workers, *sw*, is small in relation to those of capitalists *sp*, *i.e.*, $sp > sw$.

(4) The inyestment-output ratio (I/Y) is an independent variable.

(5) Elements of imperfect competition or monopoly power exist.

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1. N. Kaldor,*Essays on Value and Distribution*, 1960, pp. 227-36.

THE MODEL

Given these assumptions and taking *Sw* asaggregate savings out of wages and *Sp* as aggregate savings out of profits, we have

$$Y = W + P \quad \text{....(1)}$$

$$\therefore \quad W = Y - P$$

$$\text{But} \quad I = S \quad \text{...(2)}$$

$$\text{and} \quad S = Sw + Sp \quad \text{...(3)}$$

Investment being given and assuming simple proportional savings functions, *Sw=swW* and *Sp=spP*, we obtain the equation

$$S = spP + swW \quad \text{...(4)}$$

Dividing equation (4) by *Y*, we have

$$\frac{S}{Y} = sp\frac{P}{Y} + sw\frac{W}{Y} \quad \text{...(5)}$$

$$\frac{I}{Y} = sp\frac{P}{Y} + sw\frac{W}{Y} \quad (\because S = I) \quad \text{...(6)}$$

Put the value of $W = (Y - P)$ in (6)

$$\frac{I}{Y} = sp\frac{P}{Y} + sw\frac{Y-P}{Y} \quad \text{...(7)}$$

$$\text{or} \quad \frac{I}{Y} = sp\frac{P}{Y} - sw\frac{P}{Y} + sw$$

$$\text{or} \quad \frac{I}{Y} = (sp - sw)\frac{P}{Y} + sw$$

$$\text{or} \quad \frac{P}{Y}(sp - sw) = \frac{I}{Y} - sw$$

$$\text{or} \quad \frac{P}{Y} = \frac{I}{Y}\cdot\frac{1}{sp - sw} - \frac{sw}{sp - sw} \quad \text{...(8)}$$

Thus, given the marginal propensities to save of the wage-earners and the capitalists, the share of profits in national income depends on the ratio of investment to the total output. If there is an increase in investment-income ratio *I/ Y*, it will result in an increase in the share of profits to national income*P/Y;*

so long as $sp > sw$. This is illustrated in Fig. 1.

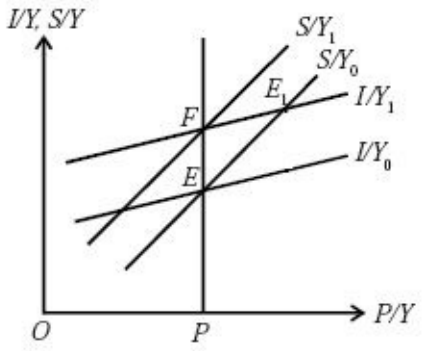

Fig. 1

Given the full employment level of income Y_0,the saving-income ratio and the investment-income ratio areS/Y_0 and I/Y_0 respectively. The economy is in full employment equilibrium at point *E* with a fixed profit-income ratio given by the vertical line *PP*. If there is an increase in income, theS/Y_0 and I/Y_0 functions shift upward to S/Y_1 and I/Y_1 at point *F*. But the share of profits in national income remains constant as given by the line *PP*. In case I/Y_0 alone shifts up to *I*/*Y*, the saving-income function remaining at S/Y_0 level, there would be inflationary rise of prices. This would raise the profit-income ratio and thus push up the saving-income function to S/Y_1 with equilibrium at point *F*. If such a relation continues between the *I/Y* and *S/Y* functions, the economy will maintain itself at the full employment level at the line *PP* and *P/Y* will remain constant.

The interpretative value of this model, according to Kaldor, depends on treating investment, or rather the ratio of investment to output *I/Y* as an independent variable, invariant with respect to changes in *sp* and sw. This, along with the assumption of full employment, shows that the level of prices in relation of the level of money wages is determined by demand. An increase in the level of investment would raise the level of demand and prices. Consequently, the share of profits in national income would rise, but reduce real consumption. Contrariwise, a fall in investment will reduce total demand, bring a fall in prices and profit margins but increase real consumption. Assuming flexible prices (or rather flexible profit margins) the system is thus stable at full employment.

As already pointed out, this model operates when the two savings propensities differ, $sp \neq sw$. $sp > sw$ is the stability condition. If *sp* is less than sw, a fall in prices would cause a fall in demand and to a cumulative fall in prices. Similarly, a rise in prices would be cumulative.

Further, “the degree of stability” of the system is dependent upon the difference between the marginal propensities to save, on $1/(sp—sw)$ which Kaldor defines

as the coefficient of sensitivity of income distribution. If there is a small difference between the two marginal propensities *(sp* and *sw*), the coefficient (l/*sp*—sw) will be large and small changes in the investment-output ratio (*I/Y*) will lead to relatively large changes in income distribution (*P/Y*)and vice versa. In case the marginal propensity to save from wages is zero (*sw = O*); the amount of profits is equal to the sum of investment and capitalist consumption,[2] *i.e.*, $P=\frac{1}{sp}I$. . This is "widow's cruse" where a rise in the consumption of entrepreneurs raises their total profit by an exactly equal amount:[3]

If however *I/Y*and *sp* are assumed to be constant over time, the share of wages will also be constant. In other words, as output per man increases real wages will rise automatically. In case the propensity to save out of wages, sw is positive *(sw*>0*)* , total profits will fall by Sw (the amount of workers' savings). When the workers' savings are reduced, total profits rise by a greater amount than the change in investment, and vice versa.

Assuming the investment-output ratio *(I/Y)* to be an independent variable, its determinants can be described in the Harrodian terminology in terms of the rate of growth of output capacity (*G*) and the capital-output ratio (*v*):

$$\frac{I}{Y}Gv^* \qquad \text{...(9)}$$

In a state of continuous full employment, *G* must equal Harrod's natural rate of growth *Gn*. For Harrod's equation of warranted rate of growth *I/Y=s* we can substitute equation (8) above:

$$\text{or} \qquad \frac{P}{Y}=\frac{I}{Y}.\frac{1}{sp-sw}-\frac{sw}{sp-sw}$$

$$\text{or} \qquad \frac{P}{Y}=\frac{1}{sp}.\frac{I}{Y} \qquad [\because sw=0]$$

$$\text{and} \qquad \frac{I}{Y}=Gv=Gw.Cr \qquad \text{[From (9)]}$$

$$\frac{P}{Y}=\frac{1}{sp}.Gw.Cr$$

Kaldor concludes: "Hence the warranted and the natural rates of growth are not independent of one another; if profit margins are flexible, the former will

adjust itself to the latter through a consequential change in *P/Y.*"

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2. Capitalist consumption is shown as 1/*sp*, just as in the Keynesian analysis marginal propensity to consume is 1/MPS.

3. Cf. J.M. Keynes, *Treatise on Money*, Vol. I, p. 139

* Kaldor's*Gv* is Harrod's*Gw. Cr.*

However, Kaldor points out that there will not be an inherent tendency to a smooth rate of growth in a capitalist economy. In fact, the causes of cyclical movements are found in disharmony between the warranted and the natural growth rates.

To Kaldor's basic equation (8) may be added two restrictions, *i.e.*, sw< *I/Y*, and *sp>I/Y*. Restriction *sw<I/Y* excludes the case of a dynamic equilibrium with a negative share of profits, and *sp>I/Y* excludes the case of a dynamic equilibrium with a negative share of wages. If the former restrictions were not satisfied, the system would enter into a state of chronic underdevelopment. Similarly if the latter were not satisfied, the system would enter into a state of chronic inflation. The Kaldor model is meant to operate within these limits and shows how a distribution of income and a rate of profit through time will help the system in equilibrium.

ITS CRITICISMS

The kaldor model of distribution has been criticised on the following grounds.

1. The model shows that the share of profits to income *P/Y*, the rate of profit on investment, and the real wage rate are functions of *I/Y* which, in turn, is determined independently of *P/Y* or the real wage rate. But this is true only under certain *conditions*. *First*, the real wage rate cannot be below a certain minimum subsistence rate. *Second*, the share of profits cannot fall below the "risk premium rate," which is the minimum profit rate necessary for inducing capitalists to invest. *Third*, the share of profits cannot be below the "degree of monopoly rate", *i.e.*, a minimum rate of profit on turnover due to imperfect competition, collusive agreements, etc. The second and third being alternative limitations, the higher of the two will apply. *Lastly*, the capital-output ratio should be independent of the rate of profit. Otherwise *I/Y* will be itself

dependent on the rate of profit.

If these conditions are satisfied, there will be an inherent tendency to growth and to a state of full employment. However, in the short run the shares of profits and wages tend to be constant due to the downturn inflexibility of *P/Y* and the real wage rate, as a consequence of the constancy of *I/Y*.

2. Another weakness of the Kaldor model is that it attributes all profits to the capitalists and in this way it implies that workers' savings are totally transferred as a gift to the capitalists. This is clearly absurd, for under such a condition no individual would save at all.

3. The Kaldor model neglects the impact of technical progress on income distribution. Even assuming that workers do not save out of wages (sw=0), it is not possible to raise the total profits of entrepreneurs by an exactly equal amount through 'Widow's Cruse'. It is in fact technical progress which helps in increasing profits.

4. According to Meade, Kaldor's theory of distribution is more appropriate for the explanation of short-run inflation than of long-run growth.

5. Like all contemporary theoretical models of economic growth, it assumes a production function that does not allow any substitution between factors. Thus it presents a rigid and angular picture of the economic progress.

6. Jan Pen has argued that when the investment-income ratio *I/Y* increases, the entrepreneurs become optimist because the share of profits increases. Given sw and *sp,* the entrepreneurs reinvest their profits. As a result, *I/Y* increases further, and so do profits. In this way, there may be an infinite expansion of the economy. But this is not possible in actuality. Rather, a continuing rise of the investment-income ratio *I/Y* is likely to lead to overspending , wage inflation, and a wage-price spiral which in fact determine income distribution. The Kaldorian theory is weak in that it does not discuss these consequences of an increase in *I/Y*. [4]

7. Kaldor's theory of income distribution is unrealistic because it does not take into consideration human capital which plays an important role in determining distributive shares in national Income. The theory states that with the rise in *I/Y,*

the share of profits in national Income increases but the share of wages falls. As a result of the decline in the share of labour, the condition of the wage earners will deteriorate. This will, in turn, reduce the economy's real income and output. Thus, in the words of McCormick, "The failure of the theory to incorporate human capital leaves the theory too simple to explain the complexities of the real world."[5]

Conclusion. To conclude with Prof. Sen: "The Kaldor model of distribution is based on a number of restrictive assumptions... It is not easy to marry this macro-model to assumptions of individual behavior, and to combine it with attempted profit maximization requires that: (a) expectations be unfulfilled, which may be all right, but also that (b)this should lead to no feedback in entrepreneurial decision making, which is not so all right. .. what is less clear is whether the Kaldor model provides a satisfactory alternative or involves a jump from the frying pan to the fire."[6]

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4. Jan Pen,*Income Distribution*, 1971.

5. B.J. McCormick,*Wages*, 1969.

6. Amartya Sen, *Growth Economics*, 1970

CHAPTER

The Pasinetti Model of Profit and Growth

THE MODEL

The Pasinetti model[1] is an extension of the Kaldor model of distribution by incorporating workers' profits as returns on their savings. It shows that there exists a distribution of income between profits and wages which keeps the system in a long-run equilibrium.

Assumptions. The Pasinetti model is based on the following assumptions:

1. There is full employment.

2. National income (Y) consists of wages *(W)* and profits *(P)*.

3. Wages are distributed to workers in proportion to the amount of labour they contribute and profits are distributed to capitalists in proportion to the amount of capital they own.

4. Each class saves a fixed proportion of its income and the capitalists' propensity to save (sc) is greater than that of workers *(sw)*.

Given these assumptions, the national income identity is

$$Y \equiv W + P$$

and

$$P \equiv P_C + P_W$$

$$Y = W + P_W + P_C$$

where, P_C and P_W relate to profits accruing to the capitalists and the workers respectively.

The savings function of the workers and the capitalists are defined as

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1. L.L. Pasinetti, "Rate of Profit and Income Distribution in Relation to the Rate of Economic Growth," *Review of Economic Studies*, Vol. 29 (4), 1962, pp. 267-79

$S_W = sw\,(\bar{W}+P_W)$ and $S_C = scP_C$, so that $S = sw(\bar{W}+P_W) + scP_C$.

We know that $I = S$

or $I = sw(W + P_W) + scP_C$

But $Y = W + P_W + P_C$

or $W + P_w = Y - P_C$

and $I = sw(Y - P_C) + scP_C$

$(\because\ W+P_W = Y - P_C)$

$= swY - swPc + scPc$

$= swY + (sc\text{-}sw)P_C$

Whence the ratio of investment to national income

$$\frac{I}{Y} = \frac{swY + (sc - sw)P_c}{Y}$$

or $$\frac{I}{Y} = sw + \frac{P_c}{Y}(sc - sw)$$

or $$\frac{P_c}{Y}(sc - sw) = \frac{I}{Y} - sw$$

or $$\frac{P_c}{Y} = \frac{1}{sc - sw} \times \frac{I}{Y} - \frac{sw}{sc - sw} \qquad \ldots(2)$$

This expression explains the distribution of income between capitalists and workers.

Similarly, the ratio of investment to total capital can be,derived from (1).

$$\frac{I}{K} = \frac{swY + (sc - sw)P_c}{K}$$

or $$\frac{I}{K} = sw\frac{Y}{K} + \frac{P_c}{Y}(sc - sw)$$

or $$\frac{P_c}{K}(sc - sw) = \frac{I}{K} - sw\frac{Y}{K}$$

or $$\frac{P_c}{K} = \frac{1}{sc - sw} \times \frac{I}{K} - \frac{sw}{sc - sw} \times \frac{Y}{K} \qquad \ldots(3)$$

The expressions (2) and (3) refer to that part of profits which accrue to the

capitalists alone.

To show the distribution of income between profits and wages, we must add the share of workers' profits into income P_W/Y to both sides of equation (2) as this equation simply represents the share of capitalists' profits in national income. Thus the distribution of income between profits and wages can be expressed as

$$\frac{P}{Y} = \frac{P_c}{Y} + \frac{P_w}{Y} \qquad \text{....(4)}$$

Similarly, equation (3) simply represents the ratio of capitalists' profits to total capital and not the ratio of total profits to total capital (rate of profit). So to find out the rate of profit, we must add the share of workers' profit into capital P_W/K to both sides of equation (3), so that

$$\frac{P}{K} = \frac{P_c}{K} + \frac{P_w}{K} \qquad \text{....(5)}$$

Pasinetti shows that there is a fundamental relation between profits and savings. In the long run, profits are distributed in proportion to the savings contributed by each category. In other words, profits are proportional to savings, and they are the same for both the workers and the capitalists. Thus

$$\frac{P_w}{S_w} = \frac{P_c}{S_c} \qquad \text{....(6)}$$

This is based on institutional principle that profits are distributed in proportion to ownership of capital. To determine the actual value of the ratio of profits to savings for the whole system, substitute the saving functions into equation (6) so that

$$\frac{P_w}{sw(W+P_w)} = \frac{P_c}{scP_c} \qquad (S = sw(W+P_w) \text{ and } S_c = scP_c$$

or $$sw(W+P_W) = scP_C \qquad \ldots (7)$$

This equation can be interpreted by saying that, in the long run, when workers save, they receive an amount of profits (P_W) which makes their total savings

exactly equal to the amount that the capitalists would have saved out of workers' profits (P_W) if these profits remained to them. In other words, the workers will always receive an amount of profits proportional to their savings, whatever the rate of profit may be. Thus the rate of profit is indeterminate on the part of workers.

On the other hand, there is a straight relation between savings and profits in the case of capitalists because their savings come out of profits. Thus for any given *sc*, there is only one proportionality relation between profits and savings which makes the ratio P_C /*scP* $_C$ equal to P_C /*Sc*. "This proportionality relation can be nothing but *sc*, which will therefore determine the ratio of profits to savings for all the saving groups, and consequently also the income distribution between profits and wages for the whole system."

To maintain full employment overtime, that amount of investment must be undertaken which is uniquely exogenously determined by technical progress and population growth. In this case, there is only one equilibrium rate of profit which is determined by the natural rate of growth divided by the capitalists' propensity to save, independently of anything else in the model. This is expressed as

$$\frac{P}{K}=\frac{n}{sc}$$

It is only this rate of profit (P/K) that keeps the system on the dynamic path of full employment.

The only condition for stability in such a system, where employment investments are carried out and prices are flexible with respect to wages, is $sc > O$. [2]

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2. In terms of the Kaldor model, the only requirement for stability is

$$\frac{d(I/Y)}{d(P/Y)} < \frac{d(S/Y)}{d(P/Y)} \text{ where } \frac{d(I/Y)}{d(P/Y)} = O \text{ and } \frac{d(S/Y)}{d(P/Y)} > O.$$

But this is only a short run condition.

Pasinetti has given two implications of the model.

First , in the long run, the workers' propensity to save (*sw*) does not influence the rate of profit such that *P/K=1/sc.I/K.* Further, *sw* does not influence the distribution of income between profits and wages such that *P/Y = 1/sc.I/Y.* All this implies that the rate of profit and income distribution between profits and wages are determined independently of *sw.*

Second , the proportion that profits bear to savings in the whole system is given by the capitalists' propensity to save *sc,* and the decisions to save of workers do not count in this respect. The share of workers in total profits is predetermined and that cannot influence it at all.

COMPARISON WITH THE KALDOR MODEL

Pasinetti has extended the Kaldor model of distribution by incorporating workers' profits as return on their savings in his model of profit and growth. By assuming workers' savings as zero, the Kaldor model fails to distinguish between the two concepts of distribution of income: distribution of income between profits and wages, and distribution of income between capitalists and workers. When *sw=O,* the two concepts coincide. The Kaldor model is weak in that it attributes all profits to the capitalists which implies that workers' savings are totally transferred as a gift to the capitalists. This is unrealistic because when an individual saves a part of his income, he must be allowed to own it, otherwise he would not save at all. In fact, the total stock of capital is owned by both the capitalists and the workers who save in the past. Since the workers save and own a part of the stock of capital like the capitalists, they also receive a share of the total profits. Thus total profits accrue both to the capitalists and the workers. This important aspect is missing in Kaldor's model which Pasinetti tries to fill in his model. He thus clears the confusion between the two different concepts of distribution of income, and clearly distinguishes between distribution of income between profits and wages, and between capitalists and workers.

Pasinetti establishes, a direct and simple relation between the rate of profit and the rate of growth based on the capitalists' propensity to save.

This is true for steady state even when workers save. This is more realistic than

Kaldor's assumption that workers' propensity to save is zero. Further, he postulates that the saving propensities differ by class rather than by type of income and that the classes are stable. His steady state requires the distribution of ownership of capital between classes to be constant. And the only condition for stability in long-run equilibrium is that $sc > O$, whereas the stability conditions, $sw < I/Y$ and $sc > I/Y$, of the Kaldor model are short-run conditions. Thus on all counts, the Pasinetti model is superior and more realistic than the Kaldor model.

CHAPTER

Joan Robinson's Model of Capital Accumulation

THE ROBINSON MODEL

Mrs Joan Robinson in her book "The Accumulation of Capital" builds a *simple model* of economic growth based on the 'capitalist rules of the game.' But "it is not so much concerned with an automatic convergence to a moving equilibrium in a capitalist economy, as with studying the *properties* of equilibrium growth."

Assumptions. Mrs Robinson's model is based upon the following assumptions:

(*a*)There is a laissez-faire closed economy.

(*b*) In such an economy capital and labour are the only productive factors.

(*c*) In order to produce a given output, capital and labour are employed in fixed proportions.

(*d*) There is neutral technical progress.

(*e*) There is no shortage of labour and entrepreneurs can employ as much labour as they wish.

(*f*) There are only two classes, the workers and the entrepreneurs between whom the national income is distributed.

(*g*)Workers save nothing and spend their wage income on consumption.

(*h*) Entrepreneurs consume nothing but save and invest their entire income

from profits for capital formation. “If they have no profits the entrepreneurs cannot accumulate and if they do not accumulate, they have no profits.”

(*i*) There are no changes in the price level.

THE MODEL

Given these assumptions, net national income in the Robinson model[1] is the sum of the total wage bill plus total profits which may be shown as

$$Y = wN + pK$$

where Y is the net national income, w the real wage rate, N the number of workers employed, p the profit rate and K the amount of capital. Here Y is a function of N and K. Since the profit rate is crucial in the theory of capital accumulation, it can be shown as

$$p = \frac{Y - wN}{K}$$

Divided by N,

$$p = \frac{\frac{Y}{N} - w}{\frac{K}{N}}$$

By putting $Y/N = l$ and $K/N = \theta$ (theta), we have

$$p = \frac{l - w}{\theta}$$

Thus the profit rate is the ratio of labour productivity *minus* the total real wage rate to the amount of capital utilized per unit of labour. In other words, the profit rate (p)depends on income (Y), labour productivity (l), the real wage rate (w)and the capital-labour ratio (θ).

On the expenditure side, net national income (Y) equals consumption expenditure (C) plus investment expenditure (I),

$$Y = C + I$$

Since Joan Robinson assumes zero saving out of wages but attributes saving to

entrepreneurs, profits are meant for investment only, we have

$$S = I$$

This saving-investment relation may be shown as:

$S = pK$

and $I = \Delta K$ [ΔK is increase in real capital]

$pK = \Delta K$ [$\because S = I$]

or $$p = \frac{\Delta K}{K} = \frac{l - w}{\theta}$$

The growth rate of capital *(ΔK/K)* being equal to *p* (the profit rate), it depends on the ratio of the net return on capital relative to the given stock of capital. If income remains constant and the wage rate decreases or income increases and the wage rate remains constant, the profit rate would tend to increase. The profit rate can also increase if the capital-labour ratio falls. In this way, the entrepreneurs maximize profits.

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1. Mrs Joan Robinson builds only a "verbal" model. The credit for constructing a mathematical model goes to Prof. Kenneth K.Kurihara, *op.cit.*

The Golden Age. Besides the growth rate of capital *(ΔK/K)*, another factor which determines the growth rate of an economy is the growth rate of population ($\Delta N/N$). When the growth rate of population equals the growth rate of capital *i.e.*, $\Delta N/N = \Delta K/K$, the economy is in full employment equilibrium. Joan Robinson characterises it as "a golden age" to describe smooth, steady growth with full employment. "When technical progress is neutral and proceeding steadily, without any change in the time pattern of production, the competitive mechanism working freely, population growing at a steady rate and accumulation going on fast enough to supply productive capacity for all available labour, the rate of profit tends to be constant and the level of real wages to rise with output per man. There are then no internal contradictions in the system. Total annual output and the stock of capital then grow together at a constant proportionate rate compounded at the rate of increase of the labour force and the rate of increase of output per man. We may describe the conditions as a *golden age.*" [2]

The golden age is explained in Fig. 1. Capital-labour ratio *K/N* or θ is

measured along the horizontal axis and per capita output on the vertical axis. The growth rate of labour force is taken to the left of *O* along the horizontal axis. The curve *OP* shows the production function. Every point on this curve shows the ratio of capital to labour. In order to find out the capital-labour ratio and the wage-profit relation, we draw a tangent *NT* which touches the production function *OP* at point *G* and cuts the vertical axis at *W* .

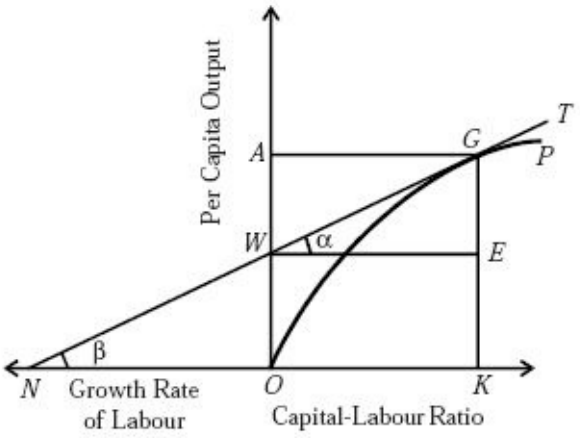

Fig. 1

Point *G* shows the capital-labour ratio for the golden age which is measured by *OK*. Per capita output is *OA* , out of this *OW* is paid as wages and *WA* or *EG* is the surplus which is the rate of profit on capital.

This figure also proves that the growth rate of capital ($\Delta K/K$) equals the growth rate of labour ($\Delta N/N$). *EG/EW* reflects $\Delta K/K$ and *OW/ON* reflects $\Delta N/N$. Thus

$$\frac{EG}{EW} = \frac{OW}{ON} \qquad [\because \tan\alpha = \tan\beta]$$

In case the economy diverges from the path of "golden age", certain forces may tend to bring back the equilibrium position. If the rate of population growth is higher than the rate of capital growth, i.e $\Delta N/N > \Delta K/K$, it will lead to progressive underemployment. In such a situation, the surplus of labour will lead to a fall in money wages and if the price level remains constant, to a fall in real wages. As a result, the profit rate would tend to rise and increase the growth rate of capital to the population level. The equilibrating mechanism would not work if real wages fail to fall either due to the rigidity of money wages or because the price level falls in the same proportion as money wages. The golden age equilibrium will not be restored and progressive underemployment will continue.

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2. J.Robinson, *The Accumulation of Capital,* p. 99.

In the contrary case of capital growing faster than population growth, i.e.,

$\Delta K/K > \Delta N/N$, equilibrium to the path of golden age can be brought about by technological changes such as a change in the capital-labour ratio or in labour productivity and by shifting the whole production function upward so that as capital accumulates, the need for labour also increases.

According to Mrs Robinson, an economy is in a golden age when the *potential growh ratio* is being realized. The potential growth ratio "represents the highest rate of capital accumulation that can be permanently maintained at a constant rate of profit." This potential growth ratio is approximately equal to the proportionate rate of labour force *plus* the proportionate rate of growth of output per head. The conditions of a golden age require the growth ratio to be steady as frequent changes in the growth ratio disturb the tranquillity of a golden age. But this tranquillity may not be possible even when thegrowth ratio is stable. A rise in the total stock of capital is likely to slacken the urge to accumulate so that a state of stagnation starts and the economy goes off the path of the golden age. The golden age is not an ideal. A new growth ratio makes a new golden age possible. An increase in growth ratio necessitates a rise in the proportion of productive capacity and a fall in consumption. Contrariwise, a fall in the growth ratio leads either to unemployment or to increased consumption. A *static state* is, however, a special case of a golden age, where the growth ratio is zero, the profit rate is also zero and wages absorb the entire net output of industry. Joan Robinson calls this the state of economic bliss, since consumption is at the maximum level which can be permanently maintained in the given technical conditions.[3]

So far as technical progress is concerned, it is neutral in the sense "that the value of capital in terms of wage units per man employed does not alter appreciably when accumulation is going on at such a pace as to keep the rate of profit constant." But the rate of technical progress depends upon demand and supply of labour. When firms fail to take advantage of the profitable markets expanding around them, they try to adopt labour-saving devices. This is because the rate of technical progress is defined as the rise in output per head, assuming zero growth rate of population. However, technical progress continues even when there is massive unemployment. Joan Robinson points out that the growth of knowledge may lead to 'autonomous innovations,' competition among firms may lead to 'competitive innovations,' and the scarcity of labour may lead to 'induced innovations.' For the purpose of the

model, the desired rate of growth may fall short of the possible rate of growth due to competitive and autonomous innovations.

The *desired growth rate* is the rate of accumulation which makes the firms satisfied with the situation in which they find themselves. The desired growth rate is determined by the rate of profit caused by the rate of accumulation, and the rate of accumulation induced by that rate of profit. Robinson uses Fig. 2 to explain it. The curve *A* represents the expected rate of profit as a function of the rate of accumulation. The curve *I* represents the rate of accumulation as a function of the rate of profit. In a situation to the right of the point *D* , the expected rate of profit is less than the rate of accumulation. Any further investment is not likely to be profitable and the rate of accumulation will fall. Between the points *S* and *D* , the rate of accumulation is less than the expected rate of profit. Therefore, there will be tendency to increase investments and the rate of accumulation will rise to point *D* . Thus the point *D* represents the desired growth rate.

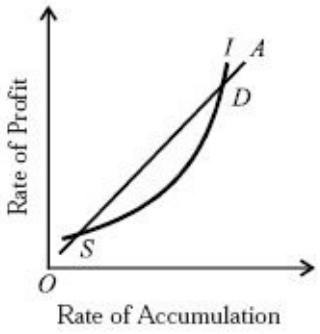

Fig. 2

3. In the Harrodian terminology, it is a state in which the *natural* , the *actual* and the *warranted* rates of growth are all equal.

On the other hand, the *possible growth rate* depends upon the physical conditions resulting from the growth of population and technical knowledge. When the desired growth rate equals the possible growth rate at near full employment, the economy is in a golden age. The real wage rate is rising with increasing output per head due to technical progress. But the rate of profit on capital remains constant. And techniques of production appropriate to the rate of profit are chosen. This is the golden age which Joan Robinson visualises.

A CRITICAL APPRAISAL

Mrs Robinson's model is an elaboration of Harrod's growth model. The possible growth rate is Harrod's natural growth rate. In the golden age, the actual (*G*) and the natural growth (*Gn*) rates are equal to each other and the warranted growth rate (*Gw*) confirms to them. Both postulate neutral technical

conditions and a constant saving ratio. However, Joan Robinson's theory of capital accumulation depends on the profit-wage relation and on labour productivity. Harrod's theory on the contrary depends on saving-income ratio and on capital productivity. The former stresses the importance of *labour* in capital accumulation while the latter that of *capital*.

Commenting on Mrs Robinson's model Kurihara opines that "*J.* Robinson's chief contribution to post-Keynesian growth economics seems to be that she has integrated classical value and distribution theory and modern Keynesian saving-investment theory into one coherent system." But it "is not capable of being modified so as to introduce fiscal-monetary policy parameters—unless labour productivity, thewage rate, the profit rate and the capital-labour ratio could be regarded as objects of practical policy as they might been regarded in a completely planned economy."[4]

ITS WEAKNESSES

Despite these merits, it has the following weaknesses:

1. According to Kurihara, "Joan Robinson's discussion of capital growth has the subtle effect of discrediting the whole idea of leaving so important a problem as economic growth to the capitalist rules of the game. Her model of laissez-faire growth demonstrates how precarious and insecure it is to entrust to private profit-makers the paramount task of achieving the stable growth of an economy consistent with the needs of a growing population and the possibility of advancing technology."

2. Joan Robinson's model is based on the assumption of a closed economy. But this is an unrealistic assumption because capitalist countries are open rather than closed economies in which foreign trade plays a crucial role in accelerating the growth rate.

3. This model assumes institutional factors as given. But the role of institutional factors as one of the determinants of economic growth cannot be neglected in any model. The development of an economy to a considerable extent depends on social, cultural and institutional changes.

4. This model is based on the unrealistic assumption of constant price level.

When an economy moves on the path to progress, investment has to be increased continuously which tends to raise the demand for factors but their supply cannot be increased to match the demand. This leads to rise in prices. Thus price rise is inevitable with growth.

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4. K.Kurihara, *op.cit.* , p. 80.

5. Mrs Robinson assumes that capital and labour are employed in fixed proportions to produce a given output. This is an unrealistic assumption because in a dynamic economy there are no fixed coefficients of production. Rather, substitutability between capital and labour takes place through time, the degree of substitutability being dependent upon the nature of technological changes.

ITS APPLICABILITY TO UNDERDEVELOPED COUNTRIES

Robinson's model has the following *merits* for underdeveloped countries.

1. Joan Robinson, in her theory, studies the problem of population and its effect on the rate of capital accumulation. There is a "golden age" which any country can achieve through planned economic development.

2. An underdeveloped economy faces the problem of the rate of population growth being faster than that of capital growth, *i.e.*, $\Delta N/N > \Delta K/K$, as posed by Joan Robinson. It reveals the tendency of progressive underemployment in such economies.

3. The "potential growth ratio" is crucial to Robinson's theory of economic growth. The golden age depends on the growth ratio. The task of planning becomes easier if the potential growth ratio of an economy is calculated for the planning period on the basis of the growth rate of labour force and of output per head.

4. In an underdeveloped economy, the rate of capital accumulation is always less than its potential growth ratio, that is why it is backward and possesses surplus of labour force. It, therefore, rests with the planning authority to increase the rate of accumulation to the level of the growth ratio for the economy. An underdeveloped country cannot, however, match the two by

following the capitalist rules of the game. On the contrary, it devolves on the planning authority to take the initiative in controlling and regulating not only private investment but also public investment in such economies.

However, it is not possible to use the concept of the ‘golden age’ in solving the problems of underdevelopment, for the unchanging continuity required for the golden age is not present in a developing economy.

CHAPTER

Meade's Neo-Classical Model of Economic Growth

THE MEADE MODEL

Prof. J.E. Meade has constructed a neo-classical model of economic growth which "is designed to show the way in which the simplest form of economic system would behave during a process of equilibrium growth."[1]

Assumptions. Meade constructs his model around the following assumptions:

(i) There is a laissez-faire closed economy where there is perfect competition.

(ii) There are constant returns to scale.

(iii) Two commodities—consumption goods and capital goods—are produced in the economy.

(iv) Machines are the only form of capital in the economy.

(v) All machines are assumed to be alike.

(vi) It is assumed that there is a constant money price of consumption goods.

(vii) There is full use of land and labour.

(viii) The ratio of labour to machinery can be changed both in the short and the long run. Meade calls this the assumption of perfect malleability of machinery.

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1. J.E. Meade, *A Neo-Classical Theory of Economic Growth,* 1961.

(ix) It is further assumed that there is perfect substitutability in production between capital goods and consumption goods.

(x) There is the assumption of depreciation by evaporation, that is, each year some percentage of machines wears out which requires replacement.

The Model. In the economy visualised above, the net output produced depends upon four factors:

(i) the net stock of capital available in the form of machines;

(ii) the amount of available labour force;

(iii) the availability of land and natural resources; and

(iv) the state of technical knowledge which continues to improve through time. This relationship is expressed in the form of the production function as,

$$Y = F(K,L,N,t)$$

where, Y is net output or net national income, K the existing stock of capital (machines), L the labour force, N land and natural resources and t is time, signifying technical progress.

Assuming the amount of land or natural resources to be fixed, net output can increase in any one year with the growth in K, L, and t. This relationship is shown as

$$\Delta Y = V \Delta K + W \Delta L + \Delta Y'$$

where, Δ in each case represents an increase, V is the marginal product of capital, W the marginal product of labour and Y' is used in place of t.

Thus "the increase over the year in the rate of annual net output (ΔY) is equal to the increase in the stock of machinery (ΔK) multiplied by its marginal products (V) plus the increase in the amount of labour (ΔL) ,multiplied by its marginal product (W) *plus* the increase in the rate of annual output due simply to technical progress ($\Delta Y'$)." The annual proportionate growth rate of output is

$$\frac{\Delta Y}{Y} = \frac{VK}{Y} \cdot \frac{\Delta K}{K} + \frac{WL}{Y} \cdot \frac{\Delta L}{L} + \frac{\Delta Y'}{Y}$$

where, $\Delta Y/Y$ is the proportionate growth rate of output, $\Delta K/K$ the proportionate growth rate of the stock of capital, $\Delta L/L$ the proportionate growth rate of labour force and $\Delta Y'/Y$ the proportionate growth rate of technical progress during a year.

Let these proportionate growth rates be expressed as *y*, *k*, *l* and *r* respectively, the proportionate marginal product of capital *VK/Y* as *U* and the proportional marginal product of labour *WL /Y* as *Q* *. Now the basic relationship is

$$y = Uk + Ql + r$$

This shows that the growth rate of output *(y)* is the weighted sum of three other growth rates, *first*, the sum of the growth rate in the stock of capital *(k)* weighted by the proportional marginal product of capital *(U) plus* the growth rate of population *(I)* weighted by the marginal product of labour (*Q*) *plus* the growth rate of technology (*r*).

But the real index of the growth of the economy is the growth rate of real income *per head* rather than the growth rate of income (*y*). If, for example, total income (*y*) rises by 10 per cent per annum and population (*l*) by 8 per cent, income per head *(y-l)* will rise by about 2 per cent per annum. The growth rate of real income per head is

$$\begin{aligned} y-l &= Uk + Ql + r-l \\ &= Uk-l + Ql + r \\ &= Uk - (l-Q)l + r \end{aligned}$$

* *VK /Y* represents the proportion of the net national income being paid as profit to the owners of machines, while *WL/Y* is the proportion of income going to the labour force as wages.

The equation reveals that the growth rate of real income per head is raised in *two* ways: *first*, by an increase in the rate of real capital *(k)* weighted by its proportional marginal product *(U);* and *second* , by an increase in the rate of technical progress (*r*). On the other hand, it is depressed by the growth rate of population (*l*) weighted by one minus the proportional marginal product of labour (1– *Q*). This part of the equation, *i.e.*, [— ((1–*Q*)/] shows the tendency

for diminishing returns as the quantity of labour is increased on a given amount of land and capital.

One of the important factors contributing to the growth rate of output is the annual rate of capital accumulation in the economy. This fact is implied in the element *Uk*. $U = VK/Y$, and $k = \Delta K/K$, but ΔK, the addition to the stock of capital is equal to the savings out of the net national income. Therefore $\Delta K = SY$, and $k = \Delta K/K = SY/K$

where, *SY* represents the amount annually added to the stock of capital through savings.*

Hence, $Uk = VK/Y \times SY/K = VS$,** and the basic growth relationship can be expressed as

$$y\text{-}l = VS - (1 - Q)\, l + r$$

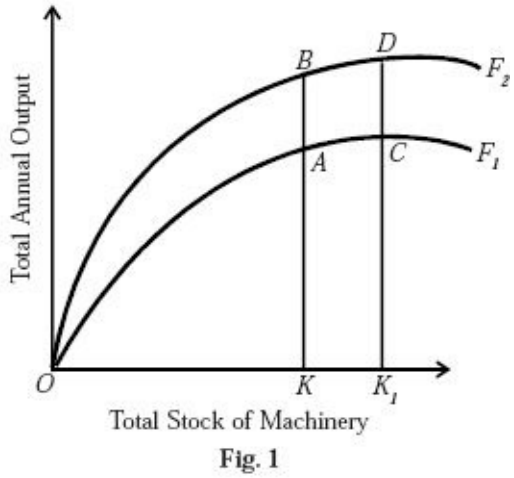

Fig. 1

Having examined the main factors determining the growth rate of real income per head, Prof. Meade discusses the conditions which may lead to changes in the rate of economic growth over time. Assuming l and r to be given and constant, changes in growth rate would be determined by the behaviour of *V, S,* and *Q* over time. If there is no change in population (l) and technical progress (r), an increase in the rate of savings *(S)* would raise capital per head and bring a decline in the marginal product of capital (V). This decline in *V* will, however, be less if it is possible to substitute capital for land and labour. And if technical progress takes place, *V* will tend to rise instead of declining. But the amount of land and labour being fixed in the economy, more capital per head will be used and at the same time technical progress will tend to raise *V* . Under these conditions, the rate of growth of income per head over time would rise which in turn would tend to raise *S.* There will be a tendency for *S* to rise still further due to a change in income distribution towards larger profits caused by the above-mentioned factors. We may conclude that with a constant population (l =0), real income per head depends upon the rate of

capital accumulation (VS) and technical progress (r). The equation is

$$y - l = VS - (1 - Q)\, l + r$$

Since $l = 0$

$$y = VS + r$$

If the rate of technical progress alongwith population growth is assumed to be constant, the growth rate in income per head will vary directly with VS.

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* S is the propensity to save and not absolute savings.

** Prof. Meade explains this point with certain numerical examples. If V, the marginal product of capital (rate of profit) is 5 per cent per annum and S, savings are 1/10 of the national income, then the contribution of capital accumulation to the growth rate of output would be 5x1/10=1/2 per cent per annum. See, *op. cit.*, pp. 16-17 for other solutions.

The effect of technical progress on total national output (income) is shown in Fig. 1. The total stock of machinery (capital) is represented on the horizontal axis and the total annual output on the vertical axis. OF 1 is the production function which shows the quantity of output, produced in year 1 with the given quantity of machinery when the technical knowledge is given. If in year 1 the quantity of machinery is OK, the production in that year will be KA. The slope of the curve at point A shows the marginal productivity of machinery which declines as we move towards the right along the curve. This is because like other factors the law of diminishing returns applies on machinery. Thus the marginal product of machinery at point C will be less than at point A. In year 2, the new production function becomes OF_2 due to technical progress. As a result, production increases from KA to KB by using the same machinery OK. Similarly, by the use of OK_1 machinery the production increases from $K_1 C$ in year 1 to $K_1 D$ in year 2. Thus technical progress leads to increase of total annual output.

The State of Steady Growth. Further Prof. Meade examines the conditions of the state of steady economic growth. It is a state in which the growth rate in total output (income) is constant and so is the growth rate in income per head. It is assumed that population is growing at a constant proportionate rate (l) and the rate of technical progress does not change.

The state of steady economic growth requires the existence of the following three conditions to ensure a constant growth rate in total income:

(*a*) All elasticities of substitution between the various factors are equal to unity.

(b) Technical progress is neutral towards all factors.

(*c*) The *proportions* of profits saved, of wages saved, and of rent saved are all constant.

Conditions (*a*) and *(b)* mean that the *proportions* of the national income going to profits *(U),* wages (*Q*) and rents (*Z*) remain constant. So do the *proportions* of national income saved out of these remunerations of factors remain constant as per condition (*c*). Let these savings out of profits *(U),* wages (*Q*) and rents (*Z*) be represented by *Sv, Sw* and *Sg* respectively, so that total savings *S=SvU+SwQ+SgZ.* Since all the elements in this equation are constant vide conditions, (*a*), *(b)* and (*c*), it follows that the ratio of total savings to total national income (*S*) will also be constant.

The growth rate of income is represented by the basic relationship $y = U + Ql + r$ wherein *U, Q, I,* and *r* are assumed to be constant Therefore, for *y* to be constant (as required by the state of steady economic growth), *k* should be constant. We know that $k=SY/K$ but *S* is constant as seen in the preceding para. So *k* will be constant if *Y/K* is constant. *Y/K* will be constant if the rate of growth of Y and *K* is the same which implies the equality of *y* and *k* itself, *i.e.*, $y=k$. The obvious conclusion follows that the growth rate of income will be constant if the growth rate of capital stock *(k)* is equal to the growth rate of national income *(y).*

Critical Growth Rate. The equilibrium position ultimately depends upon the rate of accumulation of the capital stock. According to Meade, there is a *critical growth rate* of the capital stock which makes the growth rate of income equal to the growth rate of capital stock. A more or less growth rate in the capital stock than this "critical growth rate" will not bring about the equality of *y* and *k.* If we put *a* for the 'critical growth rate' then the basic relationship will be

$$a = Ua + Ql + r$$

or

$$a = \frac{Q_l + r^*}{1 - U}$$

* This can be proved with a numerical example given by Meade. Let Q = ½, l = 2 per cent, r =l per cent, U = ¼ then

It is this critical rate which will make $y=k$, and keep the growth rate of national income constant at the steady growth level.**

If at any time there is any deviation from this level of steady growth, forces will set in to bring the growth rate of the capital stock at the equilibrium level of $\frac{Ql+r}{1-U}$. Suppose k or $\frac{SY}{K}>\frac{Ql+r}{1-U}$. In this situation income will be growing at a lower rate than the capital, stock, as a result savings will decline, so will the growth rate of capital, thereby bringing $\frac{SY}{K}$ towards the critical level. Conversely, if $\frac{SY}{K}>\frac{Ql+r}{1-U}$. then income would increase more rapidly than the capital stock, savings would increase, and so would the capital stock, as a result $\frac{SY}{K}$ would rise towards the critical level $\frac{Ql+r}{1-U}$.

Thus under the two assumptions and the three conditions noted above, the growth rate of national income and the growth rate of the capital stock would both tend towards a constant rate of $\frac{Ql+r}{1-U}$. This model of steady economic growth is explained with the help of Fig. 2. The growth rate of the stock of capital is measured along the horizontal axis and the growth rate of national income along the vertical axis. The U curve represents the proportional marginal product of capital, the curve Ay the total growth rate of national income and the 45° k the growth rate of the capital stock.

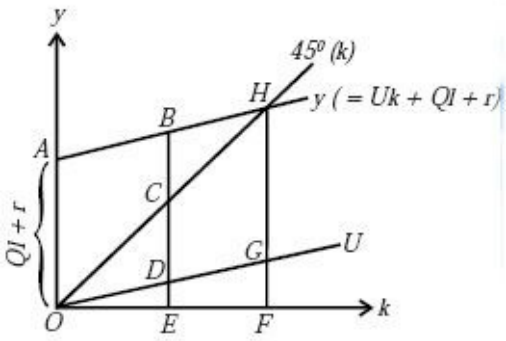

Fig. 2

Suppose to begin with the growth rate of the capital stock is OE, then growth rate of national income will be BE. But $BE=BD + DE$, where $BD= OA = Ql + r$. B point y is greater than k, *i.e.*, $BE>CE$. As a consequent, k will start rising till point F on the X -axis is reached which brings about the equality of y and k (the 45° line) at H. This represents the state of steady economic growth where the critical growth rate brings $y = k$.

$$a = \frac{(\frac{1}{2} \times 2) + 1}{1 - \frac{1}{4}} = 2\frac{3}{4} = 2 \times \frac{4}{3} = 2\frac{2}{3}$$

** Now with $2\frac{2}{3}$ as the growth rate of the capital stock, the equality of *y* and *k* can also be shown in the basic equation:

$$\begin{aligned} y &= Uk + Ql + r \\ &= (\tfrac{1}{4} \times 2\tfrac{2}{3}) + (\tfrac{1}{2} \times 2) + 1 \\ &= 2\tfrac{2}{3}. \end{aligned}$$

This is the value which *y* and *k* will have in the state of steady economic growth. See Meade, *op. cit.* , pp. 33-34.

The "critical growth rate" can also be derived from this diagram.

$$\begin{aligned} y &= Uk + Ql + r \\ HF &= GF.HF + GH \qquad [\because Ql + r = GH] \\ HF - GF.HF &= GH \\ HF\,(1 - GF) &= GH \end{aligned}$$

$$HF = \frac{GH}{(1 - GF)}$$

or $$OF = \frac{GH}{1 - GF} \qquad [\because HF = OF]$$

or $$k = \frac{Ql + r}{(1 - U)}$$

A CRITICAL APPRAISAL

Prof. Meade's neo-classical model has been severely criticised due to its unrealistic assumptions.

This model is steeped in the classical tradition of a perfectly competitive economy where all production units are assumed independent of each other. But these are unrealistic assumptions for neither is there perfect competition nor are the production units independent of each other.

The assumption of the neo-classical theory that there are only constant returns to scale is also defective. The fact is that there are increasing returns to scale rather than constant returns in the growth process.

Mrs. Robinson calls Meade's model pseudo-causal because it merely states that

monetary policy keeps the prices of consumption goods constant, while money wage rates ensure full employment.

Another serious defect of the neo-classical model stems from the assumptions that all machines are alike and there is perfect malleability of machines. The latter implies that the ratio of labour to machinery can be changed both in the short and long run. But this is unrealistic because the ratio of labour to machinery cannot be changed in the short run. Thus Meade sidetracks the problem of foresight by assuming perfect malleability of machines and depreciation by evaporation. This makes his model impracticable.

According to Prof. Butterick, there is no place for uncertainty in Meade's model. The inter-relations of all variables have been regarded as certain. This detracts from the practicability of the model and it simply remains a theoretical analysis.

Like the Harrod-Domar and Joan Robinson models, Meade's model is based on the assumption of a closed laissez-faire economy. But this is an unrealistic assumption which neglects the importance of foreign trade in economic development.

Another serious defect of this model is that it completely neglects the role of institutional factors in the development process. Meade forgets that social, cultural, political and institutional factors play an important part in economic growth. In the absence of these factors his model simply becomes the Robinson Crusoe model.

Despite these defects, the Meade model has the chief merit of demonstrating the influences of population growth, capital accumulation and technical progress on the growth rate of national income and per capita real income over time. Further, the state of steady growth is indeed Mrs. Robinson's Golden Age explained in a more realistic manner by studying the behaviour of those variables which she assumes as constants.

CHAPTER

The Solow Model of Long-Run Growth*

INTRODUCTION

Professor R.M. Solow[1] builds his model of economic growth as an alternative to the Harrod-Domar line of thought without its crucial assumption of fixed proportions in production. Solow postulates a continuous production function linking output to the inputs of capital and labour which are substitutable.

ASSUMPTIONS

Solow builds his model around the following assumptions:

(1) One composite commodity is produced.

(2) Output is regarded as *net* output after making allowance for the depreciation of capital.

(3) There are constant returns to scale. In other words, the production function is homogeneous of the first degree.

(4) The two factors of production, labour and capital, are paid according to their marginal physical productivities.

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* Students interested in the Solow-Swan Model should refer to the chapter *The Endogenous Growth Theory.*

1. "A Contribution to the Theory of Economic Growth", *Q.J.E.* , Vol. 70, 1956, pp.65-94

(5) Prices and wages are flexible.

(6) There is perpetual full employment of labour.

(7) There is also full employment of the available stock of capital.

(8) Labour and capital are substitutable for each other.

(9) There is neutral technical progress.

(10) The saving ratio is constant.

THE MODEL

Given these assumptions. Solow shows in his model that with variable technical coefficient there would be a tendency for capital-labour ratio to adjust itself through time in the direction of equilibrium ratio. If the initial ratio of capital to labour is more, capital and output would grow more slowly than labour force and vice versa. Solow's analysis is convergent to equilibrium path (steady state) to start with any capital-labour ratio.

Solow takes output as a whole, the only commodity, in the economy. Its annual rate of production is designated as *Y(t)* which represents the real income of the community, part of it is consumed and the rest is saved and invested. That which is saved is a constant *s* , and the rate of saving is *sY(t). K(t)* is the stock of capital. Thus net investment is the rate of increase of this stock of capital, *i.e* ., *dk/dt* or $\dot{K}$. So the basic identity is

$$\dot{K} = sY \qquad \ldots(1)$$

Since output is produced with capital and labour, technological possibilities are represented by the production function

$$Y = F(K, L) \qquad \ldots(2)$$

that shows constant returns to scale.

Inserting equation (2) in (1), we have

$$\dot{K} = sF(K, L) \qquad \ldots(3)$$

In equation (3), *L* represents total employment.

Since population is growing exogenously, the labour force increases at a constant relative rate *n* . Thus

$$L(t) = L_{0e}^{nt} \qquad \ldots(4)$$

Solow regards *n* as Harrod's natural rate of growth in the absence of technological change; and *L(t)* as the available supply of labour at time *(t)* . The right hand side of equation (4) shows the compound rate of the growth of labour force from period *0* to period *t* . Alternatively, equation (4) can be regarded as a supply curve of labour. "It says that the exponentially growing labour force is offered for employment completely inelastically. The labour supply curve is a vertical line, which shifts to the right in time as the labour force grows according to (4). Then the real wage rate adusts so that all available labour is employed, and the marginal productivity equation determines the wage rate which will actually rule."

By inserting equation (4) in (3), Solow gives basic equation

$$\dot{K} = sF(K, L_{0e}^{nt}) \qquad \ldots(5)$$

He regards this basic equation as determining the time path of capital accumulation, $\dot{K}$, that must be followed if all available labour is to be fully employed. It provides the time profile of the community's capital stock which will fully employ the available labour. Once the time paths of capital stock and of the labour force are known, the corresponding time path of real output can be computed from the production function.

Possible Growth Patterns. In order to find out if there is always a capital accumulation path consistent with any rate of growth of the labour force towards steady state, Professor Solow introduces his fundamental equation [2]

$$\dot{r} = sF(r,1) - nr \qquad \ldots(6)$$

In this equation *r* is the ratio of capital to labour (*K/L*), *n* is the relative rate of change of the labour force ($\dot{L}/L$). The function *sF* (*r* ,1) represents output per

worker as a function of capital per worker. In other words,it is the total product curve as varying amounts *r* of capital are employed with one unit of labour. The equation (6) itself states that the rate of change of capital-labour ratio $(\dot{r})$ is the difference of two terms, one representing the increment of capital [*sF* (*r* ,1)] and the other increment of labour (*nr*).

Solow illustrates possible growth patterns based on his fundamental equation (6) in Fig. 1, where the ray through the origin is the function *nr* . The other curve represents the function *sF* (*r* ,1). It is so drawn as to show diminishing marginal productivity of capital. At the point of intersection of the two curves *nr=sF(r, 1)* , and $\dot{r}=O$. Then *r=r'*. When *r=O* , the capital-labour ratio is a constant and the capital stock must expand at the same rate as the labour force, *i.e.* , *n* . Once the capital-labour ratio *r'* is established, it will be maintained, and capital and labour will grow in proportion. Assuming constant returns to scale, real output will also grow at the same relative rate *n* and output per head of labour force will be constant. At *r'* there will be the balanced growth equilibrium.

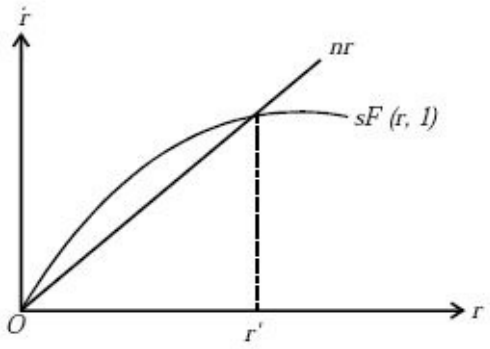

Fig. 1

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2. We arrive at the fundamental equation thus: Equation (5) helps to study the behaviour of the capital-labour ratio (*K/L*). To do this, he introduces a new variable *r* for the capital-labour ratio. Thus *r=K/L* or *K=rL* . Substituting (4) into this expression, we have

$$K=r\,L_{0e}^{nt}$$

Differentiating with respect to time to get an equation for the rate of change of capital stock, the product rule of derivates gives us

$$\frac{dK}{dt}=L_{0e}^{nt}\frac{d}{dt}\,r+r\,\frac{d}{dt}L_{0e}^{nt}$$

$$\dot{K}=\dot{r}L_{0e}^{nt}+nrL_{0e}^{nt}$$

$$=(\dot{r}+nr)L_{0e}^{nt}$$

(By taking L_{0e}^{nt} as common)

ubstituting (5) into it, we have

$$(\dot{r}+nr)\;L_{0e}^{nt}=sF(K,\;L_{0e}^{nt})$$

This tells us how capital is growing assuming that labour is fully employed and a fraction, s , of full employment output is saved in each period.

Assuming constant returns to scale which means that the production function is homogeneous of degree 1 we divide the above relation by L_{oe}^{nt} to get

$$(\dot{r} + nr) = sF\left(\frac{K}{L_{oe}^{nt}}, 1\right)$$

Taking nr to R.H.S.,

$$\dot{r} = sF\left(\frac{K}{L_{oe}^{nt}}, 1\right) - nr$$

Finally, writing r for the capital-labour ratio $\frac{K}{L_{oe}^{nt}}$ we get the Solow fundamental equation (6)

$$\dot{r} = sF(r,1) - nr$$

What will be the behaviour of the capital-labour ratio if there is a divergence between r' and r . If r lies to the right of r' or $r > r'$ then $nr > sF(r,1)$, and r will decrease toward r' . On the contrary, if r lies to the left of r' or $r < r'$, $nr < sF(r,1)$, and r will increase toward r' . Thus the equilibrium value r' is stable. "Whatever the initial value of the capital-labour ratio, the system will develop *toward* a state of balanced growth at the natural rate... If the initial capital stock is below the equilibrium ratio, capital and output will grow at a faster pace than the labour force until the equilibrium ratio is approached. If the initial ratio is above the equilibrium value, capital and output will grow more slowly than the labour force. The growth of output is always intermediate between those of labour and capital."

But the strong stability shown in the above figure is not inevitable. It depends on the shape of the productivity curve $sF(r,1)$. In Fig. 2 the productivity curve $sF(r,1)$ intersects the ray curve nr at three points r_1, r_2 and r_3. But r_1 and r_3 are stable equilibrium positions because the total productivity curve $sF(r,1)$ is above nr but at r_2 it is below nr . Therefore, r_2 is an unstable equilibrium position. "Depending on the initial observed capital-labour ratio, the system will develop either to balanced growth at capital-labour ratio r_1 or r_3. In either case labour supply, capital stock and real output will

asymptomatically expand at rate n , but around r_1 there is less capital than around r_3, hence the level of output per head will be lower in the former case than in the latter. The relevant balanced growth equilibrium is at r_1 for an initial ratio anywhere between O and r_2, it is at r_3 for any initial ratio greater than r_2. The ratio r_2 is itself an equilibrium growth ratio, but an unstable one, any accidental disturbance will be magnified over time. Figure 2 has been drawn so that production is possible without capital; hence the origin is not an equilibrium 'growth' configuration."

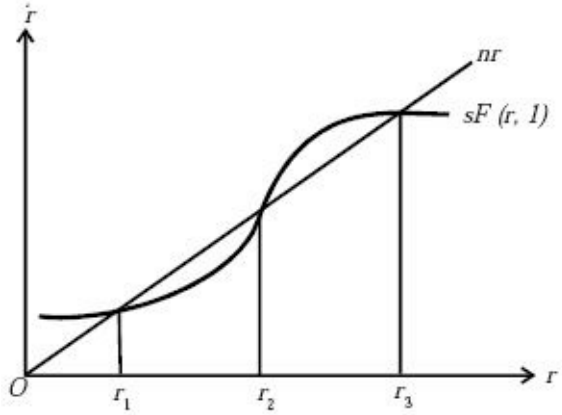

Fig. 2

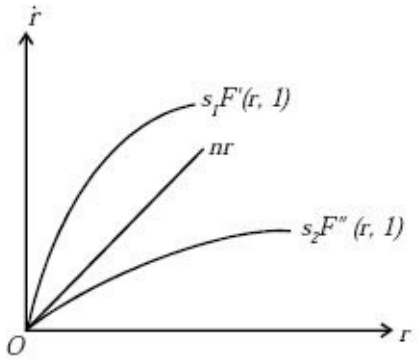

Fig. 3

Solow points out that Fig. 2 does not exhaust all possibilities. He shows two more possibilities, as shown in Fig. 3. The ray *nr* depicts the equilibrium growth path where the warranted and natural rates of growth are equal. The curve $s_1F'(r,1)$ which is above *nr* represents a highly productive system in which capital and income increase more rapidly than the labour supply. In this system, which is of perpetual full employment, income and saving increase so much that the capital-labour ratio increases limitlessly. On the other hand, the curve $S_2F''(r,1)$ depicts a highly unproductive system in which the full employment path leads to ever diminishing per capita income. However, aggregate income rises in his system because net investment is always positive and the labour supply is increasing. It is to be noted that both the systems have diminishing marginal productivity throughout. Professor Solow concludes his model thus: "When production takes place under the usual neo-classical conditions of variable proportions and constant returns to scale, no simple opposition between natural and warranted rates of growth is possible. There may not be...any knife-edge. The system can adjust to any given rate of growth

of the labour force, and eventually approach a state of steady proportional expansion," *i.e* .,

$$\frac{\Delta K}{K} = \frac{\Delta L}{L} = \frac{\Delta Y}{Y}$$

A CRITICAL APPRAISAL

The Solow model is a major improvement over the Harrod-Domar model. The Harrod-Domar model is at best a knife-edge balance in a long-run economic system where the saving ratio, the capital-output ratio, and the rate of increase of the labour force are the key parameters. If the magnitudes of these parameters were to slip even slightly from the dead centre, the consequences would be either growing unemployment or chronic inflation. In Harrod's terminology, this balance is poised on the equality of *Gw* (which depends on the saving and investing habits of households and firms) and *Gn* (which depends, in the absence of technical change, on the increase of the labour force). According to Solow, this delicate balance between *Gw* and *Gn* flows from the crucial assumption of fixed proportions in production whereby there is no possibility of substituting labour for capital. If this assumption is abandoned, the knife-edge balance between *Gw* and *Gn* also disappears with it. He, therefore, builds a model of long-run growth without the assumption of fixed proportions in production demonstrating steady state growth.

Solow is a pioneer in constructing the basic neo-classical model where he retains the main features of the Harrod-Domar model like homogeneous capital, proportional saving function and a given growth rate in the labour force. He takes a continuous production function, which has come to be known as the neo-classical production function, in analysing the process of growth. The assumption of substitutability between labour and capital gives the growth process an adjustability and provides a touch of realism. Unlike the Harrod-Domar model, he demonstrates steady-state growth paths. Last but not the least, the long-run rate of growth is determined by an expanding labour force and technical progress. Thus Professor Solow has successfully shunted aside all the difficulties and rigidities which go into the modern Keynesian income analysis.

WEAKNESSES

His "purpose was to examine what might be called the tight-rope view of economic growth and to see where more flexible assumptions about production would lead a simple model." Despite this assertion by Solow, his model is weak in many respects, as pointed by Prof. Amartya Sen.

1. The Solow model takes up only the problem of balance between Harrod's *Gw* and *Gn* and leaves out the problem of balance between *G* and *Gw* .

2. There is the absence of an investment function in Solow's model and once it is introduced, the Harrodian problem of instability quickly reappears by the Solow model. Thus, according to Sen, the assumption of substitutability between labour and capital does not seem to be a key difference between neo-classical and neo-Keynesian studies of growth, and the main difference seems to lie in the investment function and the consequent failure to assign a major role to entrepreneurial expectations about the future.

3. The Solow model is based on the assumption of labour-augmenting technical progress. It is, however, a special case of Harrod-neutral technical progress of the Cobb-Douglas production function type which does not possess any empirical justification.

4. Solow assumed flexibility of factor prices which may bring difficulties in the path towards steady growth. For instance, the rate of interest may be prevented from falling below a certain minimum level due to te problem of liquidity trap. This may, in turn, prevent the capital-output ratio from rising to a level necessary for attaining the path of equilibrium growth.

5. The Solow model is based on the unrealistic assumption of homogeneous and malleable capital. As a matter of fact, capital goods are highly heterogeneous and thus pose the problem of aggregation. Consequently, it is not easy to arrive at the steady growth path when there are varieties of capital goods.

6. Solow leaves out the causative of technical progress and treats the latter as an exogenous factor in the growth process. He thus ignores the problems of inducing technical progress through the process of learning, investment in research, and capital accumulation.

APPLICABILITY OF SOLOW MODEL TO UNDERDEVELOPED COUNTRIES

The Solow Model of growth can be applied to underdeveloped countries because of its parameter of population growth (n). The model assumes that population growth is exogenously determined and is expanding at a constant rate n . In terms of a developed economy, such an assumption appears perfectly tenable. Below a certain level of per capita income (Y_C), population growth may be regarded as a function of per capita income. But below subsistence income, population growth will be negative. As per capita income rises above subsistence, population growth responds rapidly as death rate falls. Once the death rate stabilises, the rate of population growth is likely to decline to a normal level and then become relativly insensitive to further growth of income.

But an underdeveloped country with a variable population growth raises many issues which are shown in Fig. 4 where Y_C is income per capita and K_C is capital per capita. In the Figure, three intersections A , B and C are shown between the saving function, $Sc = sF$ (Y , 1) and population function, $n = n$ (f (Y , 1). Of these, points A and C represent stable equilibria in the sense that any small disturbance will be self correcting as Y approaches zero. In contrast, equilibrium at B is unstable and any minor disturbance is perpetuated. If the economy is initially at point A , it is caught at a low level trap with low per capita income and consumption. Piecemeal attempts to raise capital per capita (K_C) will not be successful and the economy will return to A position. In such a situation, the economy requires a major fiscal boost aaccompanied by foreign aid to raise capital per capita beyond point B . This will propel the economy to the comparatively high income per capita and consumption levels. Assuming that position B has high capital-labour ratio at which capital per capita is also increasing, the economy will become self-sustaining.

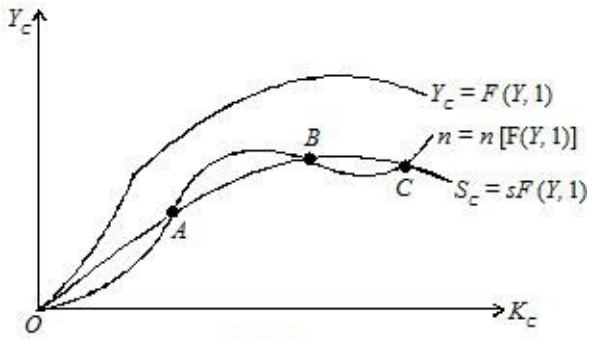

Fig. 4

CHAPTER

Kaldor's Model of Growth

INTRODUCTION

Prof. Kaldor in his *A Model of Economic Growth* [1] follows the Harrodian dynamic approach and the Keynesian techniques of analysis. The other neo-classical models treat the causation of technical progress as completely exogenous, but Kaldor attempts "to provide a framework for relating the genesis of *technical* progress to capital accumulation."

ASSUMPTIONS

The basic properties or assumptions of Kaldor's model are as follows:

1. It is based on the Keynesian full employment assumption in which the short-period supply of aggregate goods and services is inelastic and irresponsive to any increase in monetary demand.

1. *Economic Journal,* Vol. 67, December, 1957. Also in Essays on *Stability and Growth,* 1960, pp. 258-60.

2. It assumes that technical progress depends on the rate of capital accumulation. For this, Kaldor postulates "the technical progress function" which is a joint product of two tendencies: growth of capital and growth of productivity. The capital-output ratio will depend upon the relation between the two. In Fig. 1 *TT'* is the technical progress function which is convex upwards but flattens out beyond a certain point, such as *P* in the figure, when capital per worker starts diminishing. The annual percentage growth in capital per worker at time *t* is

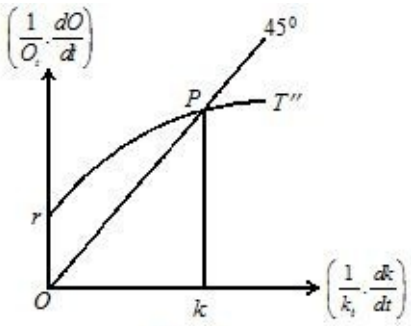

Fig. 1

$\left(\frac{1}{k_t}\cdot\frac{dk}{dt}\right)$ measured horizontally and the annual percentage growth in income per worker at time *t* is $\left(\frac{1}{O_t}\cdot\frac{dO}{dt}\right)$ measured vertically. At point *P,* the percentage rate of growth of capital and the percentage rate of output (income) are equal. The behaviour of the capital-output ratio will depend upon the flow of new ideas, as re-presented by the shape and position of the *TT* curve and the rate of capital accumulation. If the rate of capital accumulation is less than the point of equality of the growth of capital and the growth of output, the capital-output ratio will be falling and there will be labour-saving inventions, and vice versa. If the rate of capital accumulation is less than *OK* or one happens to be to the left of *P,* output will be growing faster than capital, the rate of investment will be stepped and the rate of profit on new investment will increase. This will lead to a movement towards the right till point *P* is reached. On the contrary, if one happens to be to the right of, capital will be growing faster than output, the rate of investment will decline, so will the profit rate and a backward movement towards *P* will set in till the equilibrium point is reached.

3. Income consists of wages and profits, where wages comprise salaries and earnings of manual labour, and profits comprise income of entrepreneurs as well as property owners.

4. Total savings consist of savings out of wages and savings out of profits.

5. It is assumed that the share of profits in total income is a function of investment, given the propensity to save out of profits.

6. All macro-economic concepts of income, wages, profits, capital, saving and investment used in the model are expressed at constant prices.

7. Kaldor assumes an investment function which makes investment of any period partly a function of the change in output and partly of the change in the rate of profit on capital in the previous period.

8. Monetary policy plays a passive role in the model in that money wages may be rising faster than productivity or *pari passu* with productivity, or money wages may be constant.

9. It is assumed that there are no effects of a change in the share of profits

and wages, and of a change in interest rates on the choice of techniques adopted.

10. The choice of techniques is assumed to alter with the accumulation of capital and the progress of techniques in the capital goods making industries.

THE MODEL

Given these assumptions, the model operates under two stages: *(a)* constant working population, and *(b)* expanding population. In the former, the proportionate growth rate of total real income will be the same as the proportionate growth rate of output per head. In the latter, the proportionate change in total real income in the sum of the proportionate change in output per head and the proportionate change in the total working population. We discuss these two versions of the model below.

(A) Constant Working Population. For the operation of the model, Kaldor postulates three functions: (*i*) the savings function, *(ii)* the investment function, and *(iii)* the technical progress function.

The three functions are explained in terms of linear equations as under:

(i) *Savings function*

$$S_t = \alpha P_t + \beta(Y_t - P_t) \qquad \ldots(1)$$

where, $1 > \alpha > \beta = o$

In equation (1), savings (S_t) consist of savings (α) out of profits (P_t) and savings (β) out of wages (Y_t —P_t) in period t. The inequalities $1 > \alpha > \beta = 0$ show that α and βlie between 0 and 1, and that α (savings out of profits) is greater than β (savings out of wages).

(ii) Investment function

$$K_t = \alpha' Y_{t-1} + \beta' \left(\frac{P_{t-1}}{K_{t-1}} \right) Y_{t-1} \qquad \ldots(2)$$

$$I_t = K_{t+1} - K_t \qquad \ldots (2.1)$$

where, $\alpha' > 0$ and $\beta' > 0$

Equation (2) shows that the stock of capital (K_t) at time *t* is a coefficient α‘ of the output of the previous period (Y_{t-1}) and a coefficient β’ of the rate of profit on capital of the period $\left(\frac{P_{t-1}}{K_{t-1}}\right)$ multiplied by the output of the previous period (Y_{t-1}). Equation 2.1 shows the investment function where investment in period *t* equals the stock of capital in the next period (K_{t+1}) minus the stock of capital in the current period *(K_t)* .The inequalities α’ > 0, and β’ > 0 reveal that the value of the coefficient α’ and β’ are greater than zero.

(iii) Technical progress function

$$\frac{Y_{t+1} - Y}{Y_t} = \alpha'' + \beta'' \frac{I_t}{K_t} \qquad \ldots(3)$$

where, $\alpha'' > 0$, and $1 > \beta'' > 0$

Equation (3) shows that the rate of growth of income (and labour productivity) is an increasing function of the rate of net investment expressed as the proportion of the stock of capital *(I_t/K_t)* in period *t* multiplied by the capital per head β” plusthe coefficient of technical progress α”. Here the value of the coefficient of technical progress is greater than zero but of capital per head lies between 0 and 1.

Given these functions, if we start from a point of time, *t* =l, the existing stock of capital K_1 can be regarded as a datum, inherited from the past. Taking Y_0 and K_0 as the income and capital of the previous period, Y_1 can be taken as the given income which the fully employed labour force (constant population) produces with the help of the capital stock K_1 .

The technical progress function as given by equation (3) shows the growth of income and capital from period t_1 onwards whereby the economy gradually moves from a short-period equilibrium to a long-period equilibrium of steady growth. Taking the identity $S_t = I_t$ it is the level of profits which brings about the equality of saving and investment. For a stable equilibrium path, the following condition should be fulfilled.

$$\alpha - \beta > \beta \frac{Y_t}{K_t} \qquad \text{....(4)}$$

This implies that the growth rate of savings should be greater than that of investment for the stable equilibrium. But this is only a necessary condition. The sufficient condition for the stable equilibrium path should be

$$P_t \leq Y_t - w \qquad \text{....(5)}$$

$$\frac{P_t}{Y_t} \geq m \qquad \text{....(6)}$$

In fact, equations (5) and (6) are inequalities which act as constraints on the stability of the equilibrium path. Equation 5 indicates that the level of profits (P_t) should not exceed income *minus* wages ($Y_t - w$). While equation 6 indicates that the rate of profit (P_t / Y_t) should be greater than the minimum margin of profits (m) so that the entrepreneurs should continue to make further investments. Equations (4), (5) and (6), imply that the equilibrium brought about by the equality of saving and investment through the mechanism of profits would not be a stable one. However, the steady growth path would depend on the 'technical dynamism of the economy, *i.e.*, on the technical progress function, as given by the following condition:

$$G = \frac{\alpha''}{1 - \beta''} \qquad \text{....(7)}$$

where, G is the growth rate of output which is determined by the technical progress function, as given on the right of the equation.

This is illustrated in Fig. 2 where the proportionate growth of capial $\left(\frac{K_{t+1} - K_t}{K_t}\right)$ is measured horizontally and the proportionate growth of income $\left(\frac{Y_{t+1} - Y_t}{Y_t}\right)$ vertically. Point G as determined by the technical progress function TT' and the 45° line is one of steady growth where the proportionate growth of income equals the proportionate growth of capital. Starting from period t_1 where the growth of output G_1 is greater than the growth of capital (I_1 / K_1), the rate of investment will increase in the subsequent period so as to make I_2 / K_2 equal

G_1 at A. This will, in turn, raise the growth of output in period t_2 to G_2. The rate of investment will increase further to I_3/K_3 in period t_3, so as to make I_3/K_3 equal G_2 at B. Similarly, the growth of output in subsequent periods will rise till point G is reached. This process will be reinforced by changes in the rate of profit on capital (P_t/K_t). An associated change in P_t/K_t will make increase in I_t/K_t even greater.

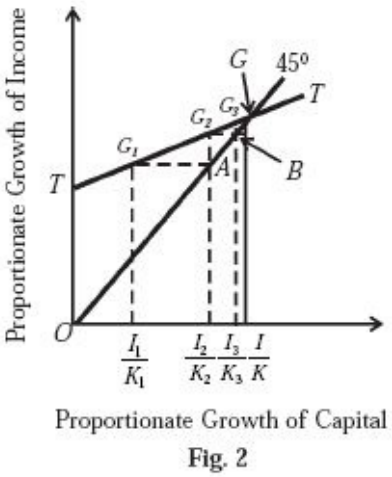

Fig. 2

(B) Expanding Population. Leaving the assumption of constant working population, Kaldor studies the relation between growth in population and growth in income. Starting from the Malthusian contention that the growth rate of population is a function of the rate of increase of the means of subsistence, he assumes that: (a) "For any given fertility rate, the percentage rate of growth in population cannot exceed a certain minimum however real income is rising;" and *(b)* "the rate of population growth will rise moderately as a function of the rate of growth of income over some interval of the latter before that maximum is reached."

Given these assumptions, the relation of population growth with the growth in income is expressed by Kaldor algebraically as under:

$$I_t = g_t \qquad (g_t \geq \lambda)$$

and

$$I_t = \lambda \qquad (g_t \geq \lambda)$$

where, I_t is the percentage rate of growth of population, g_t is the percentage rate of growth of income, and λ is the maximum rate of population growth. If $g_t < \lambda$ and so is $I_t > \lambda$, the rate of growth of income and population will continue to rise till the growth rate of population equals λ.

This relation between population growth and income growth is represented in Fig. 3, where the proportionate rate of growth of population $\left(\frac{1}{L}\cdot\frac{dL}{dt}\right)$ is measured vertically and proportionate rate of growth of income $\left(\frac{1}{Y}\cdot\frac{dY}{dt}\right)$ measured horizontally. *OY* is the growth path of income. *PL* λ is the curve of the growth rate of population. As the growth rate of income increases, the

growth rate of population also rises till the λ curve becomes horizontal as a level where the rate of growth of income *(OY)* exceeds the former, as at point *E*. In the long run, population would grow at its maximum rate indicated by L_λ portion of the dotted population-growth rate curve. This assumes that the shape and position of the technical progress function, as given by the coefficients α" and β " in equation (3) are not affected by the changes in population. This implies that there are constant returns to scale, that is, "an increase in numbers, given the amount of capital per head, leaves output per head unaffected."

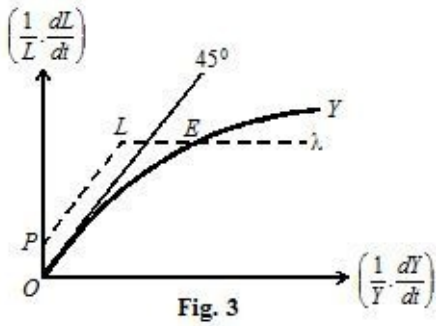

Fig. 3

But in an underdeveloped economy with a low capacity to absorb technical changes due to the scarcity of land and capital, the technical progress function will be lowered with the increase in the growth rate of population. In this situation, the technical progress function will cut the capital axis positively as at *A* in Fig. 4. This implies that in order to maintain output per head at a constant level, a certain percentage growth in capital per head will be required. We have therefore, two points of intersection *P'* and *P* of the technical progress function. Point *P'* is of unstable equilibrium and point *P* of stable long-run equilibrium. If the rates of growth of income and capital continue to diminish in the economy, both the output per head and capital per head may cease to grow. This may happen if the economy is to the left of point *P'* . If this situation persists, the technical progress function *TT'* may slip down as the dotted curve T"T" in Fig. 4. In this situation, there will not be any long-run equilibrium. Rather, there may be stagnation in the economy.

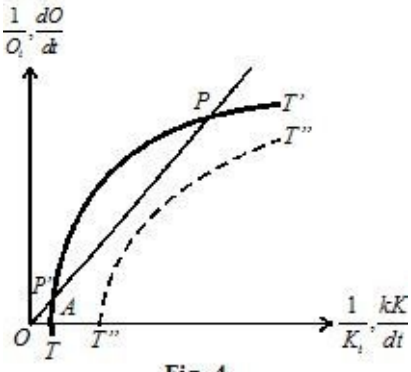

Fig. 4

The conclusion emerges from the above analysis that the growth in population will lead to long-run equilibrium growth in income depending upon the relative strength of the following two factors: "(*i*) the maximum rate of population increase λ and *(ii)* the rate of technical progress, which causes a certain percentage increase in productivity, α" in equation (3) above, when both population and capital per head are held constant."

A CRITICAL APPRAISAL

Kaldor's model is based on the Keynesian tools of analysis and follows Harrod's dynamic approach regarding the rates of change in income and capital as the dependent variables of the system. But his model is quite different from the Harrodian and other models. In Kaldor's own words, "his model is a 'piece of economics that tries to show that the ultimate causal factor was not saving or capital accumulation, but 'technical dynamism'—the flow of new ideas and the readiness of the system to absorb them."

Moreover, the model explains not only the steady growth path of the economy but also certain features of the growth process which are not explicitly dealt with by the other neo-classical model builders.

Again, the division of the model into two stages—constant population and expanding population—is an attempt to reconcile the Harrodian warranted and natural rates of growth by demonstrating the long-run tendency for the two to converge by mutual interaction. The expanding population version of the model is particularly useful in demonstrating the effect of population growth on the growth of income in underdeveloped countries..

One of the highlight of Kaldor's model is the introduction of the 'technical progress function' in place of the usual production function. The technical progress function relates technical progress to growth of productivity and capital accumulation, while the usual production function relates output per head to capital per head. Thus, the former is superior to the latter in that it brings in the role of income, wages, profits, capital, saving and investment.

Further, the technical progress function can be equally applied to an underdeveloped economy, having low capacity to absorb technical change due to scarcity of capital and other resources. In such countries, the technical progress function will be at a level much below the usual TT' curve shown in Fig. 1. However, with new discoveries and increase in the capacity of such economies to absorb technical changes, the technical progress function may rise gradually. Thus Kaldor's growth model is more realistic than the earlier neo-classical models because it is equally applicable to developed as well as underdeveloped economies.

Despite these virtues of the Kaldor model, it is not free from certain weaknesses.

1. No Explanation of Determination of Growth Rate. The Kaldor model does not explain the determination of the rate of growth of the economy, as has been explained in the Harrod-Domar models in terms of the volume of investment, saving-income ratio and the capital-output ratio.

2. No Reasons for Stability or Instability. Unlike the Harrod-Domar models, this model does not give the reasons for stability or instability in the economic system. Rather, it analysis certain features of the growth process which emphasise 'convergence and stability.'

3. Ignores Disembodied Technical Progress. Kaldor has been criticised for ignoring the disembodied technical progress in his technical progress function. Kaldor defends himself by saying that it is mainly the rate of accumulation which governs the rate of technical progress. But in his growth model with Mirrlees, he admits that "in addition to 'embodied' technical progress there is some 'disembodied' technical progress as well."

Conclusion. But these drawbacks do not detract from the advance made by Kaldor in growth theory through this model which has been further elaborated and improved upon by him along with Mirrlees.[2]

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2. N. Kaldor and J.A. Mirrlees, "A New Model of Economic Growth," *R.E.S.*, Vol. 29, 1961-62.

CHAPTER

The Models of Technical Change

INTRODUCTION

The Harrod-Domar analysis is based on the assumption of fixed coefficients in production and thus gives rise to the famous 'knife-edge' problem. The neoclassical models also treat technical progress exogenously. Kendrick, Kaldor, and Solow, among others, have been the most consistent critics of this approach who have tried to demonstrate the role of technological changes in the growth of an economy. Before discussing the models of technical change, we shall attempt the basis of these models as enshrined in the controversy over neutral and non-neutral technical change.

NEUTRAL AND NON-NEUTRAL TECHNICAL CHANGE

Technical change or progress consists of discovering new methods of production, developing new products and introducing new techniques. Technical change is synonymous with a change in the production function. When there is technical change, it leads to an increase in the productivity of labour and capital, assuming only two inputes. This is represented diagrammatically by a shift towards the origin and even a change in the slope of the isoquant. This signifies that more output can be produced either with the same inputs or with fewer inputs.

A technical change is said to be neutral when it is neither capital-saving nor labour-saving. On the contrary, non-neutral technical change is either capital-saving or labour-saving. In the literature on growth economics, the two important definitions pertaining to neutral and non-neutral technical change are by Hicks and Harrod.

HICKS NEUTRALITY

According to Hicks, a technical change is *neutral* if the ratio of the marginal product of capital to that of labour remains unchanged at *a constant capital-labour ratio.* Hicks neutral technical change is explained in Fig. 1 by comparing points on two different production functions. The vertical axis measures output per man $q(=Q/L$ where Q represents output and L labour inputs) and the horizontal axis measures the capital-labour ratio $k(=K/L$ where K and L represent capital and labour inputs in physical units). *OM* measures the ratio between the marginal product of labour and capital. *OP* is the production function before the technical change and OP_1 is the production function after the technical change.

Taking the production function *OP,* the slope of the tangent *MWA* measures the marginal product of capital and *OW* measures the marginal product of labour. To prove that *OM* measures the ratio between the marginal product of labour and capital, take the triangle *OWM.* Since the slope of *MW* slows the marginal product of capital, say *u,* we can express it as

$$u = \frac{OW}{OM} \text{ or } OM = \frac{OW}{u}$$

Hence *OM* measures the ratio between the marginal product of labour (*OW*)and the marginal product of capital (*u*).

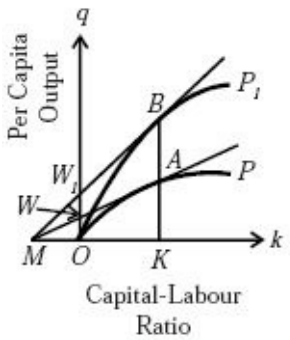

Fig. 1

Hicks-neutral technical progress requires that if technical change shifts the production function upwards from *OP* to OP_1, the ratios of the two marginal products must be the same on any vertical line from the X-axis, like *KB,* where it passes through the production functions at points *A* and *B* respectively. Again, for Hicks-neutral technical progress, the condition is that the tangent *MB* on the higher production function OP_1must originate from point *M* to the left *O,* like the tangent before the technical change. In Fig. 1 the tangent *MB* on the production functions *OP* and OP_1 originates from *M*. When both the tangents *MA* and *MB* on the production functions *OP* and OP_1originate from *M,* only then the ratios between the marginal products of labour and capital will be equal, *i..e.*, the ratio between the marginal product of

labour and capital after the technical progress, $\frac{OW_1}{u_1} = \frac{OW}{u}$, the ratio between the marginal product of labour and capital before the technical progress. Hence, the ratio between the marginal product of labour and capital is equal at points *A* and *B* on the vertical line *KB*. We may conclude that as a result of Hicks-neutral technical progress, the output per head rises by *AB* butthe capital-labour ratio (*k*)remains constant at *OK*. Thus Hicks-neutral technical change which represents a *shift* in the aggregate production function Q = *F*(*K*, *L*, *t*)can be expressed as:

$$Q = A(t)F(K, L),$$

where *Q*, *K* and *L* represent total output, and inputs of capital and labour respectively. *A*(*t*)is an index of technical progress which measures 'cumulated effects of shifts overtime' and is an increasing function of *t*.

Under Hicks-neutral technical progress, the factor shares remain constant if factor proportions and relative remunerations of labour and capital are constant. In terms of our Fig. 1, it implies that between *A* and *B* if the slope of the production function OP_1 at *B* is greater than the slope of the production function *OP* at *A* in the same proportion as the output *KB* is greater than output *KA*, then the technical progress is Hicks-neutral. This means that when the amount of capital is changed, the marginal product of capital (or the amount of profit per unit of capital) increases in the same proportion as total output. In other words, between *A* and *B* the proportion of total output which is paid out in profits and wages remains constant if technical progress is Hicks-neutral. It is also the case when the elasticity of substitution between labour and capital is equal to unity.

ITS CRITICISMS

Hicks-neutrality has been criticised on the following grounds: *First* it is a rigid type of definition even when a large number of factors of production are involved. *Second*, the dependence of Hicks-neutrality on demand elasticities, and substitution elasticities makes it a cumbersome tool of analysis. *Third*, Harrod has criticised Hicks-neutrality because it is quite unrelated to the intrinsic character of the innovation itself such as the elasticity of demand for products and factors. *Lastly*, the Hicksian neutrality is built within the

framework of static economic analysis.

HICKS NON-NEUTRAL TECHNICAL CHANGE

From the above definition of Hicks neutrality, we can also define labour-saving and capital-saving non-neutral technical changes, which Joan Rohinson terms *biased technical progress.*

LABOUR-SAVING TECHNICAL CHANGE

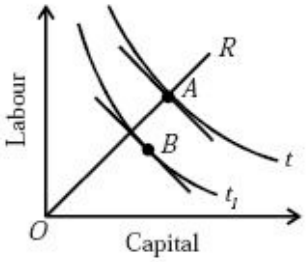

Fig. 2

A technical change is *labour-saving* if it raises the marginal product of capital relative to that of labour, at a constant capital-labour ratio. The given output would now require less labour relatively to capital. Technical change implies that a given output can be produced with fewer inputs of labour and capital than before so that the isoquant after the change (t_1)shifts below the original isoquant (t)in Figure 2. It depicts the case of labour-saving technical change where t is the isoquant before the technical progress and t_1 after the technical progress. At the point B on the isoquant t_1 less labour is required relatively to capital for a given capital-labour ratio. This type of technical change is *relatively* labour-saving. If the amount of labour used is reduced absolutely and that of capital rises, then the technical change will be *absolutely* labour-saving and capital-using.

CAPITAL-SAVING TECHNICAL CHANGE

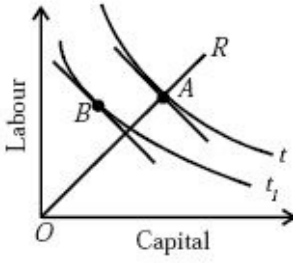

Fig. 3

A technical change is *capital-saving* if it raises the marginal product of labour relatively to capital at a constant capital-labour ratio. The given output will now require less capital relatively to labour. This is illustrated in Fig. 3 where at the point B on the isoquant t_1 less capital is required relatively to labour after the technical change for a given capital-labour ratio. This type of technical change is *relatively* capital-saving. If the amount of capital used is reduced absolutely and that of labour rises, the technical change is *absolutely* capital-saving and labour-using.

The precise manner in which the relative and absolute amounts of labour and capital used will change as the result of the technical change will depend upon the factor-elasticities of substitution and product elasticities of demand.

Harrod Neutrality. The alternative definition of neutral technical change is given by Harrod in his *Towards a Dynamic Economics*. According to him, technical change is *neutral* if at a constant rate of profit (or interest) the capital-output ratio also remains constant.[1] If the rate of profit remains constant after technical change but the capital-output ratio *rises*, then the technical change is *labour-saving*. On the other hand, if the capital-output ratio *falls* with technical change at a constant rate of profit, then the technical change is *capital-saving*.

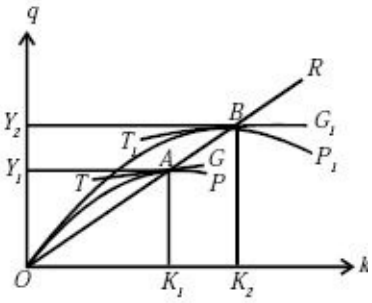

Fig. 4

Harrod neutrality is explained with the help of Fig. 4 where capital per man (k) is measured along the X-axis and output per man (q)along the Y-axis. OP is the production function before the technical change and OP_1 is the production function after the technical change. The capital-output ratio at point A onthe production function OP is OK_1/OY_1 and at point B on the production function $OP_1$is OK_2/OY_2 .Since the ray OR passes through both the points A and B, the capital-output ratios at these points are equal, *i.e.*, $OK_1/OY_1 = OK_2/ OY_2$.

Harrod-neutrality also requires that the rate of profit must remain constant along with a constant capital-output ratio after technical change. This means that the marginal productivity of capital (or rate of profit) must be the same at points A and B on the production functions OP and OP_1 respectively. This, in turn, requires that the slope of the production function OP at point A must equal the slope of the production function OP_1 at point B. In other words, it means that the tangents at A and B must be parallel to each other. In the figure, the tangent TG at point A is parallel to the tangent T_1G_1at B. Thus Harrod-neutral technical change, as shown by the shifting of the production function OP upwards to OP_1, depicts the equality of the capital-output ratio at A and B as represented by the ray OR passing through them, and also the equality of the slopes of the tangents at A and B,thereby showing a constant rate of profit.

Its Implications. There are certain implications of the Harrod neutrality.

1. Harrod's definition of neutral technical change is superior to that of Hicks because it is applicable to a dynamic situation rather than to a static situation. As such, it forms an important part of the theory of economic growth because it uses the concept of the capital-output ratio which is indispensable in modern growth analysis. Assuming constant returns to scale, changes in the capital-output ratios can come about only through technical changes.

2. In Harrod-neutral technical change there is no direct reference to labour because it is entirely based on the relationship between capital and output. Still, capital-labour ratio and output-labour ratio may change without technical change. But with a constant capital-output ratio, Harrod-neutral technical change will not by itself change the capital-labour ratio. However, a Harrod-neutral innovation may raise the productivity of all types of labour engaged in making and operating machines in exactly the same proportion as the output from these machines. In other words, it means that under Harrod neutrality the rise in the output per machine would be in the same proportion as the rise in the output per man.

1.Harrod uses' constant rate of interest while other economics have interpreted his definition in tems of constant rate of profit.'

3. Another implication of the Harrod neutrality is with regard to the distribution of factor shares in national output. Under Harrod-neutral technical change the shares of capital and labour in national output are constant if the capital-output ratio and the rate of profit are constant at *A* and *B* in Fig. 4. We may also say that when labour and capital are producing a product and there is Harrod-neutral technical change, it would raise the wages and profits of both, proportionately to the increase in output. In this context, the assumption of a constant capital-output ratio implies that the capital stock and the labour force grow at the same rate. It is then that the incomes of the capitalists would grow at the same speed at which the wages of the workers rise. If a technical change is capital-saving in Harrod's sense, this will raise the share of labour in national output and reduce that of capitalists, given a constant rate of interest. On the other hand, a labour-saving technical change will reduce the share of labour in national output and increase that of capitalists, with a constant rate of

interest.

OTHER VIEWS

Harrod neutrality can be shown also in the form of a production function as

$$Q = F[K, A(t)L]$$

Here Q is a function F of K and $A(t)L$ which means that the given constant returns to scale on equal proportionate rise in capital (K)and in effective labour units [A(t) L]must lead to an equal proportionate rise in national output (Q). With the rate of interest being constant, the efficiency of labour increases in the whole economy. "With population growth, there is an increase in the number of men at work; Harrod-neutral technical progress increases the amount of work each man can do. The result is that, both with population growth and with Harrod-neutral technical progress, the *GNP* rises at a given rate. The difference is that, with Harrod-neutral technical progress, income per head (real wage per head) increases; with population growth it remains the same. As Joan Robinson and Uzawa have shown, "on the strict definition, Harrod-neutral technical progress raises income at the same rate whatever the (constant) level of the capital-output ratio. It is this rate which measures technical progress." This formulation of Harrod neutrality has been described as 'pure labour augmenting technical progress.' Solow[2] has, however, shown that Harrod neutrality can be purely 'capital augmenting technical progress' with the production function.

$$Q = F[A(t)K, L]$$

Here $A(t)$, the index of technical progress, has been prefixed to K instead of to L, unlike as in the labour augmentation case.

Economists have shown on the basis of Joan Robinson's[3] analysis that technical progress is both Hicks-neutral and Harrod-neutral if the elasticity of substitution between labour and capital is unity and there is no change in the distribution of income. There is neutral technical change in Hicks' sense if with given labour force capital remains unchanged and the distribution of income is the same. It is Harrod neutral if with given labour force, capital increases in the same proportion as national output and the distribution of income is the same.

2. R.M. Solow, *Capital Theory and the Rate of Interest,* 1963.

3. J. Robinson, "The Classification of Inventions," *Review of Economic Studies*, February 1938.

We examine briefly the extent to which these concepts of neutrality have been used by economists in building models of technical change with particular reference to Solow's contribution.

DISEMBODIED AND EMBODIED TECHNICAL CHANGE

Technical change may be disembodied or embodied

DISEMBODIED TECHNICAL CHANGE MODEL

In 1956 Abramovitz wrote the first paper followed by Kendrick and Solow in an attempt to measure the contribution of technical change to economic growth[4]. They treated technical change as "disembodied." *Disembodied technical change is purely organisational which permits more output to be produced from unchanged inputs, without any new investment.* Disembodied technical change refers to any kind of shift in the production function that leaves the balance between capital ailed labour undisturbed in the long run. The production function for such technical change is

$$Q = F(K, L; t) \qquad \ldots (1)$$

where Q represents output, and *K* and *L* represent capital and labour inputs, and *t* represents technical change.

Taking Hicks-neutral technical change as the basis, Solow postulated the production function in the special form as

$$Q = A(t)F(K, L) \qquad \ldots (2)$$

where *A* (*t*)is an index of technical progress which indicates about a steady continuous upward shift in the production function. Such a production function implies that technical progress is organisational in the sense that its effect on productivity does not require any change in the quantity of the inputs. Existing inputs are improved or used more effectively. They just shift the production

function up through time.

Now differentiate equation (2) totally with respect to time *t* and divide by *Q*,

$$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + A\frac{\partial F}{\partial K}\cdot\frac{\dot{K}}{Q} + A\frac{\partial F}{\partial L}\cdot\frac{\dot{L}}{Q}$$

where dots indicate time derivates.

Solow uses his equation to bring about the relative share of different factor inputs.

Productivity of capital can be shown by writing equation (3) in elasticity form,

$$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + A\frac{\partial F}{\partial K}\cdot\frac{\dot{K}}{Q}\cdot\frac{K}{K}$$

or $$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + \left(A\frac{\partial F}{\partial K}\cdot\frac{K}{Q}\right)\frac{\dot{K}}{K}$$

or $$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + a\frac{\dot{K}}{K} \qquad \ldots(4)$$

Similarly, the rate of output growth per labour can be shown by writing equation (3) in elasticity form.

$$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + A\frac{\partial F}{\partial L}\cdot\frac{\dot{L}}{Q}\cdot\frac{L}{L}$$

or $$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + \left(A\frac{\partial F}{\partial L}\cdot\frac{L}{Q}\right)\frac{\dot{L}}{L}$$

or $$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + b\frac{\dot{L}}{L} \qquad \ldots(5)$$

Now *a* and *b* are the production elasticities of capital and labour respectively. Assuming linear homogeneous production function, then

$$a + b = 1$$

or $$b = (1 - a)$$

From equations (4) and (5), we have the Solow fundamental equation of the model.

$$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + a\frac{\dot{K}}{K} + (1-b)\frac{\dot{L}}{L} \qquad \ldots(6)$$

4. M. Abramovitz, "Resources and Output Trends in the United States since 1870," *A.E.R.*, May 1956; J.W. Kendrick, "Productivity Trends: Capital and Labour," *R.E.S.*, August 1956; R.M. Solow, "Technical Change and the Aggregate Production Function," *R.E.S.*, August 1957.

In disembodied technical progress, capital is assumed as homogeneous and technical progress flows down from the outside (economy). Productivity depends upon the amount of capital stock and not on its age. Disembodied technical progress improves the productivity of all factors of production or those of a particular kind already existing. All disembodied technical progress is *capital-augmenting* in which existing capital is, by one means or another, made more productive.

To explain disembodied technical progress diagrammatically, assume a per capita (per worker) production function that shifts up through time. Dividing the production function (2) through by *L*, we have

$$\frac{Q}{L} = A(t) f\left(\frac{K}{L}\right)$$

In Figure 5, the per capita production function $A(t)_0\ f(K/L)$shifts up through time at the rate λ to $A\ (t)_1(f(K/L)$and $A(t)_2\ f(K/L)$with disembodied technical progress in capital and labour, when output per head increases with a given percentage increase in the capital/labour ratio. It shows that technical progress is capital-augmenting.

Relying on the United States time series where capital and output grew at approximately the same rate, Solow proceeded to focus on the rate of technical change. "By using data on the share of capital and labour and the rates of growth of capital per head and output per head, the contribution of the 'residual' is obtained after calculating the contribution of capital. This residual is attributed to technical progress." Solow came to the conclusion that during 1909-49 the

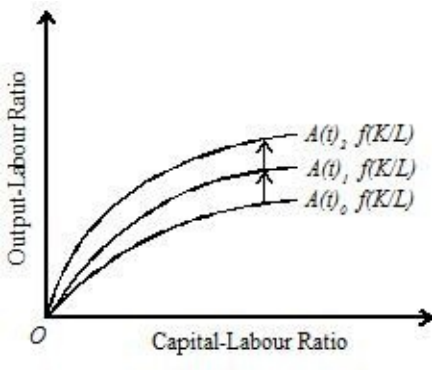

Fig. 5

average growth rate of output per head in the United States could be attributed 12.5 per cent to the increase in capital per worker and the residual 87.5 per cent to technical change.

Its Criticisms. Disembodied technical change has been criticised on the following grounds:

1. These conclusions tended to undermine the role of investment in contrast to technical change in the growth process. In the words of Phelps, "The results of this approach produced a wave of investment pessimism." Whereas, according to Rosenberg, "They provoked a wide response on the part of economists wakened, as it were, from their dogmatic slumber," They became sceptical about such a large size of the 'residual'. As Abramovitz admitted, "It is a measure of our ignorance." Griliches observed that the 'residual approach' is not of much use in understanding the growth process because it is based on the concept of a production function which is not very useful if it is not a *stable* production function and if there are very large unexplained shifts in it.

2. Critics further pointed out that the 'residual approach' tended to ignore other influences like improvements in the quality of labour due to education, etc.

3. This approach is based on the unrealistic assumptions of perfect competition, constant returns to scale and complete homogeneity of the capital stock. Therefore, Denison, Kendrick, Griliches and others tried to quantify and break down the residual into further components. They contended that the 'residual' was not a catch-all and that changes in output were due to changes in the quantities and qualities of inputs, in economies of scale and advances in knowledge rather than the result of technical change, assuming a stable production function.

EMBODIED TECHNICAL CHANGE MODEL-VINTAGE APPROACH

In an alternative model entitled *Investment and Technical Progress* (1960), Solow himself modified the residual approach based on disembodied technical change in which capital stock is regarded as homogeneous and technical change floats down from the outside. *Embodied technical progress improves the productivity of only new machines built in any period as compared with*

machines built in the previous period. But it does not increase the productivity of machines already in existence. Thus new machines are more productive than old machines. Capital stock consists of machines of different vintages, i.e., built at different dates.

Assumptions. This model assumes that: (*a*)capital stock consists of machines of different vintages i.e., built at different dates; (*b*)new machines are more productive than machines of older vintage; (*c*)technical change proceeds at some given proportional rate; (d) technical change affects only new machines; (*e*)all technical progress is uniform; (*f*) machines embody all the latest knowledge at the time of construction but do not share in any subsequent improvements in technology; (*g*) only gross investment in new machines is considered in the model; (*h*) and the production function is linear homogeneous of the Cobb-Douglas type.

The Model. Given these assumptions, under capital-embodied technical progress, capital stock is *not* treated as homogeneous. In other words, technical progress is 'embodied' in new machines which cannot be applied to existing machines. Machines embody the latest technology on their date of construction. Therefore, machines built at different dates are qualitatively dissimilar and a separate production function is needed for machines built in each vintage. Total output is the sum of output of all machines of different vintages in use. The production function is linear homogeneous. It consists of two time variables: (1) the variable *t* for time in usual sense; and (2) the variable *v* for dates of machines in use at time *t*.

Such a capital-embodied production function is

$$Qt = F\,(Jt,\ Lt)$$

where *J* denotes technologically advanced machines, also known as *capital jelly.*

The variable *J* is the aggregate stock of capital with each machine weighted by a technical progress factor. Machines of smaller vintages (small v's) receive a smaller weight than new machines (with large V's). Thus *J* can be written as

$$Jt = \sum_{v=0}^{t} Cvt\,(1+\lambda c)^{v}$$

where *Cvt* denotes the number of machines of vintages *v* still in operation in time $t \geq v$. The oldest machine in time *t* has $v = 0$. The technical growth factor is *c* which represents a constant growth rate per year. $(1 + \lambda c)^{V}$ represents the adjustment of technical progress that converts each machine of vintage *Cvt* into equivalent units of technologically advanced machine, *J*.

Now the growth rate of output is determined by the growth rates of inputs, *J* and *L*,

$$\dot{Q} = \eta J \dot{J} + \eta L \dot{L}$$

where $\dot{Q} = (dQ/dt)/Q$, $\dot{J} = (dJ/dt)J$, and $\dot{L} = (dL/dt)L$. ηJ and ηL are the elasticities of output with respect to *J* and *L* inputs respectively.

Its Appraisal. Unlike the model of disembodied technical change in which the capital stock is assumed to be completely homogeneous, in the model of embodied technical change new machines are better than old machines and technological progress is embodied in the new machines. In the former approach, capital-labour ratios change at all times along the Cobb-Douglas production function. But in the latter approach, once a machine is constructed it has fixed labour requirements. In other words, 'each machine is designed to be worked with a given crew of men and the size of the crew cannot thereafter be changed. In the terminology of Johansen, this model is said to have *ex ante* substitutability between labour and capital and *ex post* fixed coefficients or no *ex post* substitutability. Or, in the words of Phelps, it is a 'putty clay' model-putty *ex ante* and clay *ex post.* On the other hand, the model of disembodied technical change is one of *ex ante* and *ex post* substitutability or a 'putty-putty' model.

Its Limitations. There are certain limitations of the embodied approach to technical change.

1. It fails to consider the influence of wage expectations on machine construction. Infact, an investor forms expectations of wage rates extending into the future before constructing a machine. In that case the real wage rate

will not equal the marginal productivity of labour on the machine of a given vintage and type, but it will equal the average output per man on the least efficient machine in use.

2. The model is based on assumption of perfect competition and hence it fails to consider factor market imperfections.

3. The model assumes that machines depreciate exponentially. But, as pointed out by Stiglitz, this may be a reasonable assumption for telephone poles but not for most machines.

4. The entire model is based on the hypothesis that machines are of different types and new machines are better than old machines. But it does not treat 'capital-in-general' which has come to be known as the aggregation of capital stock.

5. Another assumption on which this model is based relates to fixed labour requirements. This is unrealistic for an economy with a higher output per man which may have a lower capital-labour ratio.

6. This model concentrates only on technological progress as embodied in new machines and ignores the problems of inducing innovations through the process of learning and investment in research.

Conclusion. Despite these weaknesses, unlike disembodied technical progress in which the capital stock is assumed to be completely homogeneous, in embodied technical progress new machines are better than old machines and technological progress is embodied in the new machines. In the former approach, capital-labour ratios change at all times along the production function. But in the latter approach, once a machine is constructed it has fixed labour requirements.

CHAPTER

The Uzawa Two-Sector Growth Model

INTRODUCTION

The basic neo-classical growth model has been extended by developing two-sector models by Meade, Solow, Hahn, Hahn and Mathews, and Uzawa among others. It this chapter, the Uzawa model[1] is discussed.

THE UZAWA MODEL

The Uzawa two-sector growth model[2] is built around four questions :

1. Given a stock of capital from the past and a present labour force, is there a momentary equilibrium at this point of time?

2. Is the momentary equilibrium unique?

1. H. Uzawa, "On a Two-sector Model of Economic Growth : I", *R.E.S* ., Vol 29, 1961-62 and "On a Two-sector Model of Economic Growth : II," *R.E.S* ., Vol. 30, 1963.

2. As the Ozawa Model is highly mathematical and difficult for students to understand, the analysis that follows is also based on R.M. Solow, "Note on Uzawa's Two-sector Model of Economic Growth, *R.E.S* ., Vol. 29, 1962-63 and F. H. Hahn, "On Two-sector Growth Models," *R.E.S* ., Vol. 32, 1965.

3. Is there a unique balanced growth path?

4. Is the system stable?

To answer these questions, Uzawa makes the following assumptions :

Assumptions. The Uzawa model is based on the following assumptions :

1. The economy consists of two sectors : the investment sector which we call Sector-1 and the consumption sector which we call Sector-2.

2. Sector-1 is producing a homogeneous capital good and Sector-2 is producing a homogeneous consumer good.

3. There are two homogeneous productive factors, a single grade of labour and a single type of capital depreciating at a rate μ.

4. Labour and capital are perfectly substitutable for each other in the production of consumer goods and capital goods.

5. Labour and capital are freely transferable from one sector to another.

6. An exogenously determined supply of labour is inelastically offered for employment at any point of time.

7. At any point of time, irrevocably existing stock of capital is inelastically offered for employment.

8. There are constant returns to scale in the production of the two goods.

9. All wages (w) are spent (consumed) on consumer goods and all rentals (r) (profits) are spent on capital goods.

10. There is no technical progress.

11. There is perfect competition.

12. The economy is closed.

Given these assumptions, the Uzawa model answers the four questions given above thus:

1. The existence of momentary equilibrium depends (i) on the assumption that all wages are consumed and all rentals (profits) are saved, and (ii) on the conditions of the production functions of the consumer goods sector and capital goods sector [assumptions (2), (3) and (4)].

2. The momentary equilibrium is unique in the sense that the consumer goods sector is more capital-intensive than the capital goods sector. This is a sufficient but not a necessary condition for uniqueness of momentary equilibrium.

3. The balanced growth path is also unique on the assumption that the consumer goods Sector-2 is more capital-intensive than the capital goods Sector-1.

4. Again, this assumption ensures a stable system.

EQUATIONS OF THE MODEL[3]

Before we explain the model, the following are its basic equations where the subscripts 1 and 2 denote the capital goods sector and the consumption goods sector respectively.

$$L = L_0 e^{nt} \qquad \text{....(1)}$$

Equation(1) expresses the assumption of a constant proportionate growth rate of population.

$$\dot{K} = Y_1 - \mu K \qquad \text{....(2)}$$

3. As the model is very lengthy, students may skip this section without loss in continuity. But they must read it in order to understand the working of the model.

It defines the net increase in the total capital stock ($\dot{K}$) at any moment of time, given by the output of the capital sector (Y_1) *minus* depreciation (μ) which is assumed to be proportional to the existing stock of capital.

$$Y_2 = F_2(K_2, L_2) \qquad \text{....(3)}$$

Equation (3) expresses the production function of the consumption sector where its output depends on quantities of capital and labour employed.

$$Y_1 = F_1(K_1, L_1) \qquad \text{....(4)}$$

Similarly, equation (4) expresses the production function of the capital sector.

The production functions in equations (3) and (4) are assumed to be well-behaved because they show constant returns to scale with positive and decreasing marginal productivities.

$$Y = Y_2 + pY_1 \qquad \text{....(5)}$$

Equation (5) defines Gross National Product (Y) measured in terms of the consumption goods, y_2 and p as the price of the capital goods, y_1 , in terms of the consumption goods.

$$K = K_1 + K_2 \qquad \text{....(6)}$$

$$L = L_1 + L_2 \qquad \text{....(7)}$$

Equations (6) and (7) express full-employment condition of capital and labour in Sectors 1 and 2 respectively.

$$w = \frac{\delta F_2}{\delta L_2} = p\frac{\delta F_1}{\delta L_1} \qquad \text{....(8)}$$

Equation (8) determines the wage rate (w) which is equal to the value of the marginal product of labour in both sectors under perfect competition.

$$r = \frac{\delta F_2}{\delta K_2} = p\frac{\delta F_1}{\delta K_1} \qquad \text{....(9)}$$

Similarly, equation (9) determines the rental (r) which is equal to the value of the marginal product of capital in both sectors under perfect competition.

$$pY_1 = sY \qquad \text{....(10)}$$

Equation (10) shows investment-saving *ex-ante* equality on the assumption that a constant fraction is saved out of GNP (Y) which is automatically invested.

At any moment of time, the labour force is given exogenously and the capital stock is given as an outcome of past accumulation so that equations (3) to (10) determine the *short-run equilibrium*, and equations (1) and (2) determine the

long-run equilibrium or the the *path of growth equilibrium.*

As the *four questions* posed above in the model relate to the long-run equilibrium, we are not concerned with the short-run equilibrium.

To explain the working of the model, we first define the following derived variables :

$$k = \frac{K}{L}, y = \frac{Y}{L}, \sigma = \frac{w}{r}$$

$$k_1 = \frac{K_1}{L_1}, y_1 = \frac{Y_1}{L}, l_1 = \frac{L_1}{L}$$

and $n = \frac{\Delta L}{L}$, i.e. labour supply growing geometrically at rate n .

On the assumption of the homogeneous production functions of the first degree, equations (3) and (4) can be expressed as :

$$Y_1 = L_1 F_1\left(\frac{K_1}{L_1}, 1\right) = L_1 f_1\left(\frac{K_1}{L_1}\right)$$

sothat $$\frac{Y_1}{L} = \frac{L_1}{L} f_1\left(\frac{K_1}{L_1}\right)$$

Substituting the derived variables y_1, l_1, and k_1

$$y_1 = f_1(k_1) l_1$$

$\because$ $$\frac{\delta F_1}{\delta K_1} = f_1'(k_1)$$

From the assumption made on f_1, we have

$$f_1(k_1) > O, f'(k_1) > O, f''(k_1) > O$$

and for both $k_1 > O$.

WORKING OF THE MODEL

In the Uzawa model, there are two perfectly substitutable productive factors producing capital goods in Sector-1 and consumer goods in Sector-2. These goods are produced under constant returns to scale. They have homogeneous production functions. There being full employment of labour and capital, a given value of $\sigma(w/r)$ determines the division of labour force between the two sectors and their outputs $(Y_2 \text{ and } Y_1)$. Both industries make optimal adjustments and these yield unit costs. Competition then sets the price ratio $p(=P_2/P_1)$ for the two goods equal to the ratio of unit costs. Thus any σ(= *w* / *r*) determines an equilibrium price ratio *p* with only one set of prices of goods such that no producer makes a profit or loss.

The technique of production in Sector-1 is shown by the capital-labour ratio, k_1 Since there are constant returns to scale, the least-cost technique depends on $\sigma(w/r)$. Thus there can be only one k_1 associated with each σ and to each σ there corresponds a unique price-ratio, *p* , of the two goods.

Assuming that the producers in the two sectors plan to supply as much of each good as is demanded at a given $\sigma(w/r)$ and associated price-ratio, *p* , there are two types of incomes, i.e., *wL* (wages of labour) and *rK* (rental on capital). A given proportion of each type of income is spent on each type of good (Y_2 and Y_1). Since the initial capital-labour ratio, *k* , is known and the price ratio, *p, is uniquely determined* by $\sigma(w/r)$, the ratio in which the two goods (Y_2 / Y_1)are demanded is a function of σ which is a single-valued and continuous function. It follows that the ratio in which capital and labour are demanded is also a function of σ(*w/r*). Thus σ is a unique wage-rental ratio for which both equilibrium conditions are satisfied.

Momentary Equilibrium. We may normalize *w* and *r* by taking then to be non-negative and that they add up to one. This can be done as we have seen above because only their ratio σ(=*w* /*r*) matters. Normalized *w** and *r** refer to equilibrium prices of wages and rentals in relation to the demands for labour (*L*') and capital (*K*'). Nomalized *w** and *r** are called a *momentary equilibrium* if at these values the excess demands for labour and capital are each negative.

This is because on the assumptions of the model, the Walrus Law takes the form :

$$w(L'-L)+r(K'-K)=0$$

where w and r represent wage and rental, L' and K' are demands for labour and capital and L and K their given supplies. The above equation shows that labour or capital can be in equilibrium excess supply only if its price is zero.

Since the excess demand functions of labour and capital are continuous over the normalized price space, an equilibrium exists.

Thus, $w^* > 0, r^*=0$ is a *momentary equilibrium.*

It follows that if $w^* = 0, r^*=0$ is a momentary equilibrium, then it is a *unique* equilibrium only if for all $w \neq w^*, r \neq r^*$ $w+r=1$, then

$$(w-w^*)Y_L(w,r)+(r-r^*)Y_K(w,r)>0$$

where $Y_L(w,r)$ and $Y_K(w,r)$ are the excess demand functions for labour and capital respectively.

Stability Proposition. The stability proposition states that with the labour supply growing at the rate $n(= \Delta L/L)$, the system will eventually approach a situation in which $k(= K/L)$, is constant so that the capital stock is also growing at the rate n and the whole economy changes only in scale. By assuming $n = \Delta L/L$, and all rentals are spent on gross investment,

$$\Delta K = rK/P_1 - \mu K,$$

the product-rental of capital in Sector-1 is equal to the marginal product of capital in Sector-1, $f_1'(k_1)$, since under constant returns to scale it depends only on $k_1(=k_1/L_1)$. Combining all these, we have

$$\Delta k/k = \Delta K/K - \Delta L/L = f_1'(k_1) - n - \mu$$

where μ is depreciation of capital.

This is Uzawa's stability proposition which asserts that both sides of this equation tend to zero. To prove it, we have to prove that when k is very high, Δ

k/k becomes negative and when *k* is very low, *Δ k/k* becomes positive. But the marginal product of capital $f_1'(k_1)$ is a decreasing function of k_1. Now we have to show that *k* and always move in the same direction and $f_1'(k_1)$ decreases and ultimately becomes equal to or less than (n+μ). There is a possibility that *k* and k_1 always move in the same direction. $f_1'(k_1)$ increases when $\sigma(=w/r)$ increases and so does k_2 It means that the capital-labour ratio increases in each sector whenever the wage-rental ratio rises. *This stability proposition leads to the balanced growth path.*

Condition for Stability of the Balanced Growth Equilibrium. The stability of the equilibrium growth path is also unique on the assumption that Sector-2 (consumer goods sector) is more capital-intensive than Sector-1 (capital goods sector). To prove this, suppose that at any $\sigma(=w/r)$ ratio, $K_2 / L_2 > K_1 / L_1$; so is $rK_2 / wL_2 > rK_1 / wL_1$. Under constant returns to scale and perfect competition, when σ rises, the price ratio, $p(=P_2/ P_1)$ increases or decreases according as the relative share of wages in Sector-2 is greater or smaller than in Sector-1. Thus *p* falls when σ rises and vice versa.

From the assumption that all wages are spent on consumer goods and all rentals are saved, we have $wL / rK = P_2Y_2 / P_1Y_1$ and $\frac{K}{L} = \frac{w}{r} \frac{P_1Y_1}{P_2Y_2}$.

If *w/r* rises, P_1 / P_1 will also rise. So *K/L* must rise unless Y_1 / Y_1 falls. But if Y_1 / Y_1 falls, there is a shift in favour of consumption goods which are more capital-intensive. As proved above, with the capital-labour ratio increasing in both sectors and the capital-intensive consumer goods Sector-2 gaining at the expense of Sector-1, $k(= K / L)$ must rise. Thus k_1 and *k* must move together and the stability condition for equilibrium growth holds.

But the condition that Sector-2 is more capital-intensive than Sector-1 is a *sufficient condition* for stability and *not a necessary condition* . How this condition is violated but stability occurs is explained in the following example.

Suppose both sectors have Cobb-Douglas production functions with elasticities of α_1 and $1-\alpha_1$for $k_1$and L_1, and α_2 and $1-\alpha_2$ for k_2 and L_2.

Then $rK = \alpha_1 P_1 Y_1 + \alpha_2 P_2 Y_2$

and $rK = P_1 Y_1$

Then $P_1 Y_1 = \frac{\alpha_2}{1-\alpha_1} P_2 Y_2$

and $\frac{P_1 Y_1}{P_2 Y_2} = \frac{\alpha_2}{1-\alpha_1}$

But $\frac{P_1 Y_1}{P_2 Y_2} = \frac{rK}{wL}$

So $\frac{rK}{wL} = \frac{\alpha_2}{1-\alpha_1}$

In the above equation, the right-hand side is a constant. Hence whenever *r/w* falls, k_1 rises and *K/L(=k)* must also rise. So we find that k_1 and *k* move together and stability occurs. It does not matter whether Sector-2 is more capital-intensive than Sector -1.

A CRITICAL APPRAISAL

Uzawa extends the basic one-sector neo-classical growth model to a two-sector growth model with a consumer goods sector and a capital goods sector.

Limitations. It has certain limitations.

1. It is a highly mathematical model consisting of numerous equations which makes it difficult for readers to understand.

2. The assumptions that there are no savings out of wages and all rentals (profits) are spent on capital goods and nothing is spent on consumption, are not true.

3. The assumption that the consumers goods sector is more capital-intensive than the capital goods sector is highly restrictive. As pointed out by Solow, “It seems paradoxical to me that an important characteristic of the equilibrium path should depend on such a casual property of the technology.”

4. According to Hahn, the assumptions required to establish uniqueness of momentary equilibrium are all “terrible assumptions” because people differ in the assets they hold in their age and tastes.

CHAPTER

The von Neumann Growth Model

INTRODUCTION

John von Neumann, the great German mathematician presented *A Model of General Economic Equilibrium* at the Princeton University in 1932 [1].

THE NEUMANN GROWTH MODEL

The von Neumann model is a multisector mathematical balanced growth model of an expanding economy. It associates growth of production and consumption with every economic process in a dynamic framework.

Assumptions. The model is based on the following assumptions :

1. Every commodity is either an output or an input in the production process.

2. All outputs are used as raw materials for further production.

3. The supply of land, labour, capital and other factors of production is unlimited so as to permit the indefinite expansion of the economy.

4. There is no independent source of demand for commodities.

1. This paper was first published in an Austrian mathematical journal edited by Karl Menger in 1938. Its English translation by George Morton appeared in *Review of Economic Studies* Vol. 13, 1945-46, pp 1-9.

5. Each production process uses as inputs the goods produced in the previous period by itself and by other sectors of the economy.

6. The amount of any commodity used at a particular period of time must not exceed the amount of that commodity available at that time.

7. The production process intensities in any period do not require more than the available raw material inputs or the outputs of the preceding period.

8. There is a linear homogeneous production function which exhibits constant returns to scale.

9. There is unchanged technology in the production process.

10. It is a closed system (i.e. economy)

11. There is perfect competition in the system.

THE MODEL

Given these assumptions, the Neumann model examines the possibility of balanced growth at a constant rate α in an expanding economy. The model tries to find out whether there is a maximal value of α and a maximum uniform rate of expansion of the economy, and the characteristics of this highest attainable growth rate.

The model assumes that the economy is engaged in the production of n commodities (j = 1,2,3, ... n) with m processes (i = 1, 2, 3, ..., m). Each of the processes turns out some inputs into outputs in fixed proportions.

Suppose the process i is carried out at the unit level of intensity. Further, a_{ij} and b_{ij} denote the input and output respectively of the j th commodity in the i th process. Thus the economy will use a_{ij} of j commodity as an input and will produce b_{ij} of j commodity as an output. If process i does not use j commodity as an input, then $a_{ij} = 0$. Similarly, if process i does not produce j commodity, then $b_{ij} = 0$. But in the economy, $a_{ij} \geq 0$ and $b_{ij} \geq 0$.

Now Neumann uses a set of process intensities $\mu_1, \mu_2, \ldots, \mu_m$ corresponding to m processes so as to equalise the growth rate of commodities in the economy. Suppose μ_1 units of process i are used by the economy during a period. So the total use of j commodity as an input to process i will be $a_{ij}\mu_i$ and the total output of j commodity by this process will be $b_{ij}\mu_i$. Thus the total amount of j

commodity used by all processes will be $\sum_{i=1}^{m} a_{ij}\mu_i$ and its total output will be $\sum_{i=1}^{m} b_{ij}\mu_i$

If inputs and outputs are to grow at the growth rate α, any input which was $\sum_{i=1}^{m} a_{ij}\mu_i$ in period *t* will expand to α $\sum_{i=1}^{m} a_{ij}\mu_i$ one period later. But that input must come from the preceding period's total supply of output $\sum_{i=1}^{m} b_{ij}\mu_i$ (as per assumption 5). Therefore, the *first condition* for the Neumann model is that the inputs used tomorrow must not exceed the supply made available today. This is expressed as :

$$\alpha \sum_{i=1}^{m} a_{ij}\mu_i \leq \sum_{i=1}^{m} b_{ij}\mu_i \qquad \text{...(1)}$$

(for all j = 1 to n)

This inequality shows that some goods grow faster with given process intensities. *This leads to maximising the growth rate of the economy.*

According to Neumann, for this there is nothing as a negative level of operation of a process so that

$$\sum \mu_i > 0$$

Neumann carries his model further by taking a set of output prices $P_1,...P_2,...P_n$ and an interest factor, $\beta = 1 + z/100,$ (where *z* is the percentage interest rate) in a system of perfect competition. In this case, prices will be so set that any process will yield zero profits.

To explain this no-profit condition, suppose a unit of process *i* uses a_{ij} units of *j* input and each unit costs P_j dollars. So the total input cost of the unit of process *i* will be $\sum_{j=1}^{n} a_{ij}P_j$. But when the inputs are used after one period, their cost , including their interest cost, will increase from

$\sum_{j=1}^{n} a_{ij} P_j$ to $\beta \sum_{j=1}^{n} a_{ij} P_j$.

In that period, the process will produce b_{ij} quantities of outputs having total market value of $\sum_{j=1}^{n} b_{ij} P_j$. Therefore, with no profits, the total cost of the unit of process $\beta \sum_{j=1}^{n} a_{ij} P_j$ must equal its total money yield (revenue), $\sum_{j=1}^{n} b_{ij} P_j$.

Since under perfect competition, profits must be non-positive, therefore for the *i* process, its total cost must be greater than or equal to the sum of all revenue in that period. This leads to the *second* condition of the Neumann model.

$$\beta \sum_{j=1}^{n} a_{ij} P_j \geq \sum_{j=1}^{n} b_{ij} P_j \qquad \text{....(2)}$$

If inequality holds for some processes which yield only losses (i.e. total cost is greater than total revenues), they get rejected as inefficient processes. For any such inefficient process *i'* , we will have $\mu_{i'} = 0$ which means that the process will remain *unutilised* . It may be expressed as

$$\text{If} \quad \beta \sum_{j=1}^{n} a_{ij} P_j > \sum_{j=1}^{n} b_{ij} P_j \qquad \text{....(3)}$$

then $\mu_{i'} = 0$

Leaving this exceptional case of losses, we assume that atleast one process is not inefficient where one equality sign holds in equation (2) of the system.

The last requirement of the system is that any particular commodity *j* will be a free good for which its price $p_{j'} = 0$, if an excess quantity of this commodity is available. In other words, if its available supply from all processes exceeds the quantity of that commodity which will be needed as an input in the next period, it will be a free good and hence its price will be zero. This condition can be expressed as

If $$\alpha \sum_{i=1}^{n} a_{ij'} \mu_i < \sum_{i=1}^{n} b_{ij'} \mu_i \qquad \text{....(4)}$$

then $P_{j'} = 0$.

The central point in Neumann's analysis is that there exists a unique solution to his model. The proof given by him is beyond the mathematical level of our understanding. He shows that whatever the values of the parameters of his model, so long it satisfies the conditions described above, there will always be set of values for $\mu_1 \ldots \mu_m, P_1 \ldots P_n$ and α and β which satisfy the requirements of maximum growth in the model.

The model determines the values of α and β uniquely in the system. Neumann proves that in an optimal solution, a single *maximum* growth rate β of the system must equal a single *minimum* interest rate β of the system to cover the cost of investment in inputs. This is in keeping with the no-profit condition following from the assumption of perfect competition. If some outputs exceed inputs by more than α per cent per period while β, the interest cost of such process, is less than α, the entire process will be profitable.

In the final analysis, there will be no sustainable growth rate, say *α'*, greater than the equilibrium growth rate, *α'* . "For if there were available alternative processes capable of yielding a higher growth rate, α', then the α growth rate would not be consistent with equilibrium. Entrepreneurs would switch to these alternative processes because with interest rate at the old rate, β_1 they would make a profit. With the interest rate then raised to β'=α' to eliminate this profit, the old now maximal growth-rate processes would only be operational at a loss."

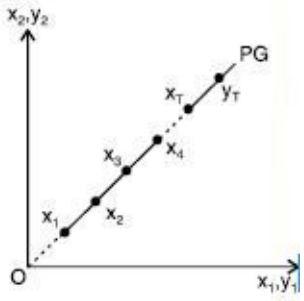

Fig. 1

Prof. Koopmans[2] gives a geometrical representation of the Neumann growth path on a two-dimensional diagram. According to him, Neumann limited his explanation to a *proportional growth path* where all goods grow at the same rate and at the fastest rate.

2. T.C. Koopmans, “Economic Growth at a Maximal Rate,” *Q.J.E.*, Vol. 78, 1964.

Suppose there are two activities x_1,x_2 and y_1,y_2 where proportions are constant over time and they grow at the same rate. They are measured on x -axis and y -axis respectively. In Fig. 1, their proportional growth path is represented by a rising straight line PG where the output pair of each period’s activity equals the input pair for that of the next period. PG is a unique maximal growth path of the system which is called the proportional growth path.

A CRITICAL APPRAISAL

Neumann presented a path-breaking model of growth under perfect competition in a general equilibrium context which explains economic growth in general and maximum possible growth rate in particular.

It is a highly complex mathematical model which has been solved, interpreted and extended by Dorfman, Samuelson and Solow, and by Radner, Mckenzie, Morishima, Koopmans and others.

The Neumann model has been criticised due to its unrealistic assumptions on the following grounds:

1. The assumption of unchanging technology of production and consumption is highly unrealistic.

2. An other defect is that consumption is not treated as an end in itself. Consumer goods are treated as inputs to processes and labour as an output. As the economy expands and more labour is required, more is produced by getting more consumer goods. It implies that there are only labour-producing processes that are utilised to absorb the minimum consumer goods to produce the required labour as output. This labour appears to be drawn from some subsistence sector having a reserve army of labour.

3. It is unrealistic to assume that all production and consumption activities grow in time at the same proportional rate.

4. The model assumes a capital stock at time t_1 that leads to proportional growth at a maximal rate through competitive equilibrium. This is unrealistic

because the model ignores completely the given slock of capital at the beginning of time t .

5. The assumption that every commodity enters every production process either as an input or as an output, is unacceptable in practice. How can ice-cream be used as one of its inputs or outputs? The question is absurd.

On these counts, Koopmans characterises this model as “poor economics.”

CHAPTER

Steady State Growth

MEANING

The concept of steady state growth is the counterpart of long-run equilibrium in static theory. It is consistent with the concept of *equilibrium growth*. In steady state growth all variables, such as output, population, capital stock, saving, investment, and technical progress, either grow at constant exponential rate, or are constant.

Taking different variables, some of the neo-classical economists have given their interpretations to the concept of steady state growth. To begin with Harrod, an economy is in a state of steady growth when *Gw=Gn*. Joan Robinson described the conditions of steady state growth as Golden Age of accumulation thus indicating a "mythical state of affairs not likely to obtain in any actual economy." But it is a situation of stationary equilibrium. According to Meade, in a state of steady growth, the growth rate of total income and the growth rate of income per head are constant with population growing at a constant proportionate rate, with no change in the rate of technical progress. Solow in his model demonstrates steady growth paths as determined by an expanding labour force and technical progress.

PROPERTIES OF STEADY STATE GROWTH*

The neo-classical theory of economic growth is concerned with analysing the properties of steady state growth based on the following basic *assumptions* of the Harrod-Domar model:

1. There is only one composite commodity which can be consumed or used as an input in production or can be accumulated as a capital stock.

2. Labour force grows at a constant proportional rate *n*.

3. Full employment prevails at all times.

4. Capital-output ratio (*v*) is also given.

5. Saving-income ratio (*s*) is constant.

6. There are fixed coefficients of productions. In other words, there is no possibility of the substitution of capital and labour.

7. There is no technical change (*m*).

The neo-classical growth models discuss the properties of steady state growth by incorporating and relaxing these assumptions.

In order to discuss the properties of steady state growth, we first study the Harrod-Domar model briefly.

The Harrod-Domar model is not a steady state growth model where Gw ($= s/v$) = Gn ($=n + m$). It is one of knife-edge balance between cumulative inflation and cumulative deflation. It is only when the warranted growth rate s/v equals the natural rate of growth $n+m$, that there will be steady state growth. But, s,v.n and m being independent constants, there is no valid reason for the economy to grow at full employment steady state. So we discuss the roles assigned to them one by one in neo-classical growth theory.

1. FLEXIBILITY OF *n*

Economists like Joan Robinson and Kahn have shown that the presence of

unemployment is compatible with steady growth. So the assumption of the growth rate of labour force at full employment is dropped. Instead, it is replaced by the condition that the growth rate of employment should not be greater than n. For steady growth it is not necessary that $s/v=n$. Rather, equilibrium growth is compatible with $s/v<n$. This is what Kahn calls a *bastard golden age* as against Joan Robinson's golden age where $s/v=n$. In a bastard golden age, the rate of capital accumulation (s/v) is less than the growth rate of population (n), so that unemployment increases. In this age, capital stock is not growing faster because of inflationary pressures. Rising prices mean a lower real wage rate. When the real wage rate is at the tolerably minimum level, it sets a limit to the rate of capital accumulation.

2. FLEXIBLE CAPITAL-OUTPUT RAIO (v)

Now we turn to the second assumption of the Harrod-Domar model, that of a constant capital-output ratio (v). Solow and Swan have built models of steady state growth with a variable capital-output ratio.

Theoretically, the Harrod-Domar assumption of an unchanging capital-output ratio implies that the amount of capital and labour required to produce a unit of output are fixed. The neo-classical economists postulate a continuous production function linking output to the inputs of capital and labour. The other assumptions of constant returns to scale, no technical progress and constant saving ratio are retained.

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* The following sections also relate to the *Basic Neo-Classical Growth Model.*

Solow-Swan show that because of the substitutability of capital and labour and by increasing the capital-labour ratio, the capital-output ratio can be increased and hence the warranted rate s/v can be made equal to the natural rate, $n+m$. If the warranted growth rate exceeds the natural growth rate, the economy tries to break through the full employment barrier, thereby making labour more expensive in relation to capital, and making inducements to shift to labour-saving techniques. This raises the capital-output ratio and the value of s/v is reduced until it coincides with $n+m$. If, on the other hand, the warranted growht rate is less than the natural growth rate, there will be surplus labour which lowers the real wage rate in relation to the real interest rate. Consequently,

more labour-intensive techniques are chosen which reduce the capital-output ratio (v) thereby raising s/v. This process continues till s/v equals $n+m$. Thus, it is the capital-output ratio which maintains the steady state growth single-handed while s, n and m remain constant.

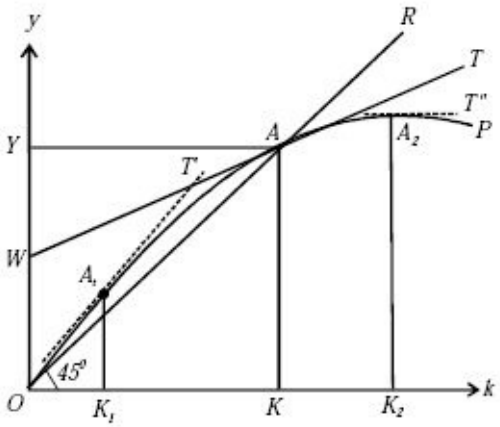

Fig. 1

This situation is explained in Fig. 1 where capital-labour ratio (or capital per man) k, is taken on the horizontal axis and output per man, y, is taken on the verticle axis. The 45° line OR represents capital-output ratio where the warranted growth rate equals the natural growth rate. Every point on OR also shows a constant capital-labour ratio. OP is the production function which measures the marginal productivity of capital. It also expresses the relation between output per man (y) and capital per man (k). The tangent WT to the production function OP indicates the rate of profit at point A corresponding to the marginal productivity of capital. It is at this point A that the warranted growth rate equals the natural growth rate, *i.e.*, $s/v=n+m$. Here the share of profit is W_Y in national, income is O_Y, and OW is the wage per man. Assume a situation K_2 where the stock of capital is above the equilibrium stock. It indicates that the capital-labour ratio is above the full employment equilibrium level ratio at A_2. Thus, there is some idle capital which cannot be utilised and the rate of profit declines (which can be shown by joining tangent T'' at A_2 to the Y-axis where it shall be above OW) till it reaches point A of steady state growth. The opposite is the case at K_1 where the growth rate of capital accumulation is higher than that of labour force. The rate of profit increases at A_1 (which can be shown by joining the tanget T' to the Y-axis where it shall be below OW) till the steady state growth point A is reached. In the Harrod-Domar model there is a single point of equilibrium A on the production function OP because the capital-output ration (v) is fixed. But in the new-classical model there is a continuous production function along which the capital-output ratio is a variable and if the economy is thrown off the steady state level A, it will itself return to it by variations in the capital-labour ratio. Thus the equilibrium value of K is stable.

3. FLEXIBILITY OF SAVING RATIO (*s*)

The Harrod-Domar model is also based on the assumption of a constant saving-income ratio (*s*). Kaldor and Pasinetti have developed the hypothesis which treats the saving-income ratio as a variable in the growth process. It is based on the classical saving function which implies that savings equal the ratio of profits to national income.

The hypothesis is that the economy consists of only two classes, the wage-earners and the profit-earners. Their savings are a function of their incomes. But the propensity to save of profit-earners(*sp*) is higher than that of wages-earners (*sw*). As a result, the overall saving ratio of the community depends on the distribution of income.

A special case of this hypothesis is where the propensity to save out of wages is zero (*sw*=0) and the propensity to save out of profits is positive and constant. Thus the overall propensity to save (*s*) is equal to the propensity to save of profit-earners (*sp*) multiplied by the ratio of profits (π) to the national income (*Y*), *i.e*., $S = sp.\pi/Y$. This is th classical saving function. There is also the 'extreme' classical saving function where all wages are consumed (*sw*=0) and all profits are saved (*sp*=1). Hence the saving-income ratio $s = \pi/Y$.

With a constant capital-output ratio (*v*) and a variable saving-income ratio (*s*), steady state growth can be maintained through the distribution of income. So long as the saving-income ratio (*s*) required to satisfy the condition $s/v=n+m$ is not less than the propensity to save of wage-earner (*sw*=o) and not greater than the propensity to save of profit-earners (*sp*=1), steady state growth will be maintained.

4. FLEXIBLE SAVING RATIO (*s*) AND FLEXIBLE CAPITAL-OUTPUT RATIO (*v*)

Steady state growth can also be shown by taking both the saving-income ratio and the capital-output ratio as variables. With the classical saving function given by $sp.\pi/Y$, the warranted growth rate s/v can be written as :

$$Gw = \frac{s}{v} = \frac{sp\pi}{Y}.\frac{Y}{K} = \frac{sp\pi}{K} \qquad \left[\begin{matrix}\because s = sp.\pi/Y \\ v = K/Y\end{matrix}\right]$$

where π/K is the rate of profit on captial which can be denoted by *r*. Thus the warranted rate becomes *spr*. For steady state growth, *spr = n+m*, whereby the warranted rate becomes equal to the natural rate of growth. In the special case where *sp*=1 equilibrium between the two is reduced to *r = n+m.*

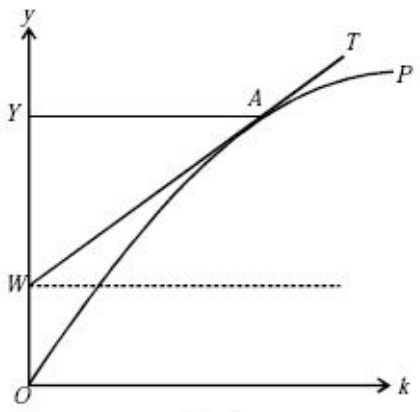

Fig. 2

Steady state growth with a variable saving ratio and a variable capital-output ratio is shown in Fig.2. *OP* is the production function whose slope measures the marginal productivity of capital (*r*) at any capital-output ratio on a point on *OP*. Equilibrium takes palce where the tangent *WT* touches the *OP* curve at point *A*. The tangent *WT* originates from *W* and not from *O* because savings taking place out of non-wage income *WY*. Point A indicates the rate of profit corresponding to the marginal productivity of capital. In other words, at point *A* labour and capital receive the rewards equal to their marginal productivities. *OW* is the wage rate (the marginal productivity of labour) and *WY* is the profit (the marginal productivity of capital). Thus the steady state equilibrium exists at *A.*

5. TECHNICAL PROGRESS

So far we have explained steady state growth without technical progress. Now we introduce technical progress in the model. For this, we take labour augmenting technical progress which increases the effective labour force *L** in the form of a rate of increase in labour productivity.

Assume that the labour force *L* is growing at a constant rate of *n* in year *t*, so that

$$L_t = L_0 e^{nt} \qquad ...(1)$$

with labour augmenting technical progress, the *effective* labour force *L** is growing at the constant rate of λ in year *t*, so that

$$L^*_t = L^*_0 e^{(n-\lambda)t} \qquad ...(2)$$

where L^*_O represents the total *effective* labour force in the base period *t*=o embodying all technical progress up to that point in time;

n is the natural growth rate of *effective* labour in the base period;

λ is a constant precentage growth rate of *effective* labour embodied in the base period.

Now the production function for output per worker is

$$q = \frac{Q}{L^*} = \frac{Q}{L_e^{\Omega}} = f\left(\frac{Q}{L_e^{\Omega}}\right) = f(k) \qquad ...(3)$$

where $\dot{k} = K/L^*$, and the growth rate of $\dot{k}$ (the capital-*effective* labour ratio) is equal to the difference between growth rate of capital stock $\left(\dot{K}\right)$ and the growth rate of *effective* labour

$$\left(\dot{L}\right), \text{ i.e. } \dot{k} = \dot{K} - \dot{L} \qquad ...(4)$$

Since $L^* = L_o e^{(n + \lambda)t}$ the growth rate of effective labour L^* is exogenously given as $(n + \lambda)$, so that equation (4) can be written as

$$\dot{k} = \frac{Q}{K} - (n+\lambda)$$

$$= \frac{q}{k} - (n+\lambda)$$

$$\left[\frac{q}{k} = \frac{Q/L}{K/L} = \frac{Q}{K}\right]$$

$$= f(k) - (n+\lambda) \left[\because q = f(k) \text{ in equation (3)}\right] \qquad ...(5)$$

By setting = *O*, we have

$$f(k) = (n+\lambda)k \qquad ...(6)$$

which is the equilibrium condition for steady state growth with technical progress.

This is illustrated in Figure 3 where the capital per *effective* worker k is taken horizontally and output per *effective* worker q is taken on the vertical axis. The slope of the ray $(n+\lambda)\,k$ from the origin to point E on the production function $f(k)$ determines the stable equilibrium values k' and q' for k and q repectively at E and the capital used per unit of *effective* labour grows at the rate λ with technical progress.

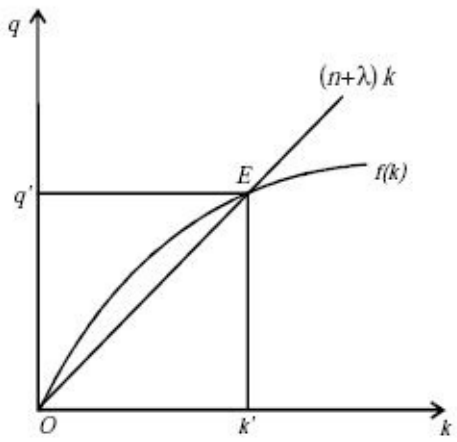

Fig. 3

CHAPTER

The Golden Rule of Accumulation

INTRODUCTION

Edmund Phelps[1] while explaining the golden age growth lays down the Golden Rule of Accumulation. According to the golden rule of accumulation, in a golden age per capita consumption is maximised when the saving rate equals the profit rate. If the saving rate is less than the profit rate, the per capita consumption is less than the attainable maximum. If, on the other hand, the saving rate is higher than the profit rate, per capita consumption will decline. Thus it is a specific target rate of saving that maximises per capita consumption in golden age. This is called the *golden rule* or *optimal saving rate.* If the same amount of consumption is provided to members of each current and future generation, the maximum amount of per capita consumption is called the *golden age path.* This consumption maximising golden age path is called the *Golden Rule Path.*

The golden rule is explained in Fig. 1 where golden age per capita consumption, (C/L)* is taken on the vertical axis and the savings rate on the horizontal axis. As we move along the *CS* curve, per capita consumption increases at low levels of saving and decreases at high levels of saving. It is at the golden rule saving rate *s*g* that per capita consumption is maximised at *c*g* level of per capita consumption. This is the highest point *H* on the *CS* curve.

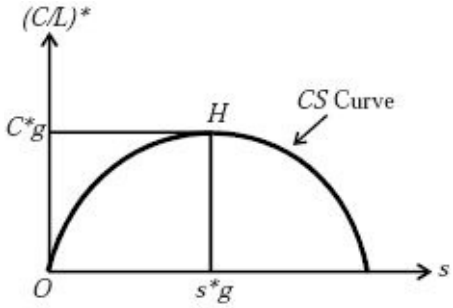

Fig. 1

1. E.S. Phelps, "The Golden Rule of Accumulation : A Fable for Growthman," *A.E.R.*, September, 1961. Also *Golden Rules of Economic Growth*, 1966.

THE GOLDEN RULE PATH

A golden age path is a growth path on which every variable changes at a constant proportionate rate, *i.e.* consumption, output, capital stock and everything else is growing at the same rate. This growth rate is *g* which is the natural (or equilibrium) growth rate. This rate is independent of the ratio of capital accumulation to output (investment ratio). Corresponding to this investment ratio, there exists atleast one capital-output ratio which will be maintained. The existence of a natural growth rate implies that capital and labour are substitutable in such a way that the capital-output ratio can adjust to any value of *s*. Under conditions of equilibrium growth, the capital-output ratio is

$$\frac{K^*}{Q^*} = \frac{s}{g} \quad \text{or} \quad g = s\,(Q^*/K^*)$$

where,* (a star) denotes equilibrium value of *K* (capital) and *Q* (output), *s* is saving rate and *g* is golden age growth rate.

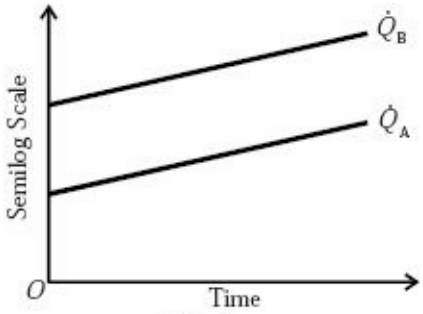

Fig. 2

The growth rate *g* is not a function of s, but it is *s* that determines *K*/Q**. If we have two golden age paths with equal growth rates, the one with the higher saving rate will have the higher capital-output ratio, and with positive marginal products, the higher level of output. Thus the saving rate affects the *level* at which the economy grows but it does *not* affect its growth rate. This situation is illustrated in Fig. 2 where logarithmatically parallel two golden age paths $\dot{Q}_A$ and $\dot{Q}_B$ pass a given check point, say time zero. They are identical in all respects. But the saving rate on path $\dot{Q}_B$ is higher. This implies that path $\dot{Q}_B$ has a higher capital-output ratio and a higher level of output than path $\dot{Q}_A$.

In deciding which growth path is the best, a generation will look only at the amount of consumption which each path offers. Given a constant *s*, every golden age path is associated with a per capita consumption path *(C/L)** on which consumption grows exponentially at the same rate as output. Under conditions of equilibrium growth, per capita consumption along these parallel paths $(C/L)_1^*$, $(C/L)_2^*$ and $(C/L)_3^*$ in

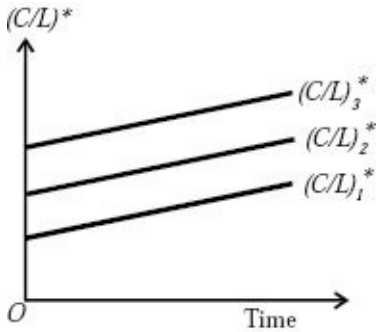

Fig. 3

Fig. 3 grows at the identical rate *g*. Therefore, there exists some uniformly highest possible per capita consumption path, such as $(C/L)_3^*$ than any other consumption path. All generations will naturally prefer this path with its corresponding saving rate, to any lower per capita consumption path, such as $(C/L)_2^*$ or $(C/L)_1^*$. This golden age path produces a path of consumption that is uniformly higher than the consumption path associated with any other golden age path. Thus the golden rule determines the equilibrium growth path that maximises per capita consumption for *all time*, once the economy reaches that path.

The higher the saving rate (or investment rate), the higher the level of output. But how much higher? That depends on the marginal product of capital, *r*. Having a little more capital, ΔK, at this time would yield $r\Delta K$ more in output. In fact, $r\Delta f$ is the extra output of capital. But all this is not available for consumption. Having a little more capital now commits the economy to some additional investment in the present and in future to keep the slightly lower larger capital stock growing at a fixed rate, *g*. In particular, a little extra capital, ΔK, now means that an output of gAk of capital goods is required simply to keep the new little extra capital growing at rate *g*.

If $r\Delta K > g\Delta K$ *or* $r > g$, having a little more capital now will yield some extra consumption now and for all time. On the other hand, if $r < g$, having a little less capital now would actually siphon off enough productive capacity to the investment sector to reduce consumption. Consumption is at a maximum when $r = g$ (when the marginal product of capital equals the growth rate). The rate of profit is included in the value of the marginal product of capital. Thus the optimal amount of capital under the golden rule is that which equates the profit rate to the growth rate.

REPRESENTATION OF THE GOLDEN RULE

The golden rule of accumulation is explained in Fig. 4. Since the golden rule relates to the maximisation of per capita consumption, we plot output (*Q*), saving (*s*), investment (*I*) and capital stock *(K)* as ratios to the quantity of labour *(L) i.e.*

$$\frac{\dot{I}}{L} = s\left(\frac{\dot{Q}}{L}\right) \qquad [\because I = K] \qquad \text{...(1)}$$

or $$\frac{\dot{I}}{L} = g\left(\frac{\dot{K}}{L}\right) \qquad \text{...(2)}$$

where, dots over the variables denote golden age magnitudes.

Equation (2) shows that in a golden age per capita investment (or saving) must equal the equilibrium growth rate times per capita capital stock. Therefore, per capita investment is directly proportional to capital-labour ratio. As a result, the $\dot{I}/L$ curve is drawn as a straight line from the origin.

Now, by equating (1) and (2), we get

$$\frac{\dot{I}}{L} = \frac{s}{g} \text{ or } g = s\left(\frac{\dot{Q}}{\dot{K}}\right) \qquad \text{....(3)}$$

Equation (3) represents the golden age growth rate which is the slope of the $\dot{I}/L$ curve.

Next the production function

$$Q = A(t)(K^{\boldsymbol{a}}, L^{\boldsymbol{1-a}})$$

where, *A (t)* is some constant. By holding $t = 0$, and dividing both sides by *L*, we have

$$\frac{Q}{L} = A\left(\frac{K}{L}\right)^{a}$$

By converting variables in the above equation in relation to the golden age, we have

$$\frac{\dot{Q}}{L} = A\left(\frac{\dot{K}}{L}\right)^{a}$$

which is drawn in the figure as the $\dot{Q}/L$ curve.

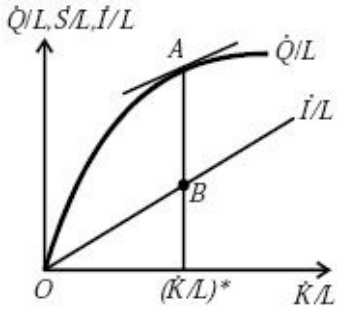

Fig. 4

The slope of the $\dot{I}/L$ curve is equal to the golden age growth rate, *g*, and the slope of the $\dot{Q}/L$ curve equals the marginal product of capital, *r* (rate of interest). According to the golden rule of accumulation, the growth rate must equal the rate of interest, $g = r$, in an optimal golden age. This is explained in Fig. 4 where $\dot{Q}/L$, $\dot{S}/L$ and $\dot{I}/L$ are taken on the vertical axis and K/L on the horizontal axis. The optimal golden age, as per the golden rule of accumulation, is at the equilibrium capital-labour ratio $(K/L)^*$ where the vertical distance between the curves $\dot{Q}/L$ and $\dot{I}/L$ is the greatest. It is *AB* in the figure. Thus the golden rule of accumulation is satisfied when the vertical difference between the two curves $\dot{Q}/L$ and $\dot{I}/L$ is at the maximum. It is here that the per capita consumption is maximised.

THE NEOCLASSICAL CASE

Phelps has extended the golden rule of accumulation to the neoclassical growth model. The neoclassical production function can be expressed as

$$Q = f(K,L) \qquad \text{....(1)}$$

where, *Q* represents output, *K* capital stock, and *L* labour force

The neoclassical growth model assumes constant returns to scale. It means that the production function is homogeneous of degree one. We divide equation (1) by *L*

$$\frac{Q}{L} = f\left(\frac{K}{L}, \frac{L}{L}\right)$$

$$= f\left(\frac{L}{L}, 1\right)$$

$$\frac{Q}{L} = f(k) \qquad [\because k = K/L]$$

or $$q = f(k) \qquad [\because q = Q/L]$$

where, *q* shows output per augmented labour and *k* denotes capital per unit augmented labour.

Further, the model assumes that labour force grows at an exponential rate *n*. Thus

$$\frac{\dot{L}}{L} = n \text{ where } n > 0 \qquad \text{....(2)}$$

Also capital stock must be equal to the available supply of labour force. Therefore,

$$\frac{dK}{dt} = I = nk \qquad \text{....(3)}$$

Finally, the per capita consumption (c) is the difference between output per unit *(q)* and gross investment per unit *(nk)*.

$$c = q - nk$$

or

$$c = f(k) - nk \qquad \text{....(4)} \qquad [\because q = f(k)]$$

Differentiating equation (4) with respect to k equal to zero, consumption is maximised

$$c' = f'(k) - (nk)'$$

$$f'(k) - n = 0$$

$$f'(k) = n \qquad \text{....(5)}$$

It implies that consumption is maximised in a golden age when the marginal product of capital equals the growth rate of labour force.

CHAPTER

Growth Accounting

INTRODUCTION

Growth accounting refers to the breaking down the rate of growth of total output of an economy into contributions from the growth of such inputs as capital and labour, and technological growth. Growth accounting also relates to the *sources of growth.*

Modern growth theory groups the sources of economic growth into two parts :

First, increase in factor inputs through changes in the quantity of factors and their composition, *i.e.* number of labour hours used in production and the size of the capital stock.

Second, increase in total factor productivity due to technical progress, *i.e.* amount of output per unit of factor inputs, such as capital and labour. The total factor productivity (TFP) has been called the *residual*. The residual is the difference between the measured growth rate of inputs and that of output. Kendrick, Solow, Denison, and Jorgenson and Griliches are the leading economists who have measured the contribution of the *residual* to the overall growth rate of the US economy.

We discuss below the sources of growth analysed by Solow, Denison and Jorgenson-Griliches.

SOLOW'S SOURCES OF GROWTH

In 1957, Solow[1] estimated the contribution of technical change to the overall growth rate of the US economy. For this, he separates variations in output per head due to technical change from those due to changes in the availability of capital per head.

Solow treats technical change as *disembodied* where capital is assumed as homogeneous and technical changes as exogenous. Disembodied technical change is capital augumenting in which existing capital is, by one means or another, made more productive. This productivity depends upon the amount of capital stock and not on its age.

Solow uses the aggregate production function for such technical change as

$$Q = F(K,L,t) \qquad ...(1)$$

where, *Q* represents output, and *K* and *L* represent capital and labour inputs, and *t* represents technical change.

Taking Hicks-neutral technical change as the basis, Solow postulates the production function in the special form as

$$Q = A(t)\, F(K,L) \qquad ...(2)$$

where, *A(t)* is an index of technical change which is called total factor productivity.

Differentiate equation (2) totally with respect to time and divide by *Q*

$$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + A\frac{\partial F}{\partial K}\cdot\frac{K}{Q} + A\frac{\partial L}{\partial F}\cdot\frac{L}{Q} \qquad ...(3)$$

where dots indicate time derivatives.

Under the assumption of constant returns to scale, the capital share and the labour share add to 1. If $\alpha(t)$ is the capital share, the share of labour is $1-\alpha(t)$. By substituting these values in equation (3), we have Solow's fundamental equation

$$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + \alpha(t)\frac{\dot{K}}{K} + [1-\alpha(t)]\frac{\dot{L}}{L} \qquad ....(4)$$

This equation tells that the growth rate of output $(\dot{Q}/Q)$ is equal to the rate of technical change $(\dot{A}/A)$ *plus* a weighted average of the growth rate of capital $(\dot{K}/K)$ and the growth rate of labour $(\dot{L}/L)$.

This residual factor from equation (4) can be written as

$$\frac{\dot{A}}{A} = \frac{\dot{Q}}{Q} - \alpha(t)\frac{\dot{K}}{K} + [1 - \alpha(t)]\frac{\dot{L}}{L} \qquad \text{....(5)}$$

Thus the residual ($\dot{A}$ /A) can be measured by subtracting from the rate of change of output that part of the growth rate which is accounted for by a weighted sum of the rates of change of capital and labour factor inputs.

Relying on the United States time series where capital and output grew at approximately the same rate, Solow proceeds to focus on the rate of technical change. By using data on the share of capital and labour, and the rates of growth of capital per head and output per head, the contribution of the 'residual' is obtained after calculating the contribution of capital. This residual is attributed to technical progress. Solow comes to the conclusion that during 1909-49 the average growth rate of output per head in the United States can be attributed 12.5 per cent to the increase in capital per worker and the residual 87.5 per cent to technical change.

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1. R.M. Solow, "Technical Change and the Aggregate Production Function," *R.E.&.S.*, August, 1957.

ITS CRITICISMS

Solow has been criticised for his method of measuring the residual and for his estimates on the following grounds :

1 . His estimates undermine the role of investment in contrast to technical change in the growth process. According to Phelps, "The results of this approach produced a wave of investment pessimism."

2. Economists were sceptical about such a large size of the "residual." Abramovitz admitted it as "a measure of our ignorance." While according to Rosenberg, it "provided a wide response, on the part of economists wakened, as it were from their dogmatic slumber."

3. Griliches observed that the residual approach is not of much use in understanding the growth process because it is based on the concept of a production function which is not very useful if it is not a *stable* production

function and if there are very large unexplained shifts in it.

4. Critics pointed out that Solow demoted the role of capital by assuming disembodied technical progress, whereas the most significant advances in technical progress require capital embodiment. Solow himself admitted it and presented an alternative model in 1959 on the assumption of embodied technical progress in new investment.

5. Solow further admitted that there are index number problems involved in the measurement of each of the variables in his measurement of the residual.

6. Solow's approach is based on the unrealistic assumptions of perfect competition, constant returns to scale and complete homogeneity of the capital stock.

7. Solow's approach ignored such components as improvement in the skill and quality of the labour force, return to investment in research and education, improvement in techniques within industries and changes in the industrial composition of input and output, etc.

Conclusion. Denison, Jorgenson and Griliches and others have tried to quantify and break down the residual into further components. They contend that the residual is not a catch-all and that changes in output are due to changes in the quantities and qualities of inputs, in economies of scale and advances in knowledge rather than the result of technical change, assuming a stable production function.

DENISON'S SOURCES OF GROWTH

Denison in a number of studies [2] for the United States identifies a number of sources of growth and estimates the portion of the growth rate attributable to each. He divides the sources of growth into four main categories :

(1) the contribution of two factor inputs, labour and capital, adjusted for quality changes but *not* dependent on technical change;

(2) advances in knowledge which is a "true" measure of TFP (total factor productivity), obtained as a residual;

(3) improved resource allocation; and

(4) economies of scale.

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2. E.F. Denison, *The Sources of Economic Growth in the U.S. and Alternatives Before U.S.*, 1962; Also *Why Growth Rates Differ : Post-War Experience in Nine Western Countries*, 1967.

In his study *The Sources of Economic Growth in the U.S.*, Denison estimated the contribution of different resources with the help of Cobb-Douglas type production function. He kept all inputs together. He took two factor inputs, labour and capital. He derived an index of the stock of inputs on the basis of a particular base year, 1929. In order to construct this index, he took data of different inputs and multiplied them with their relative contribution to output which were estimated by the relative shares of income in the base period. In calculating the contribution of education to output, Denison treated workers of different educational categories as different inputs. Then the growth rates of the number of workers in different educational categories were aggregated into an index of the growth rate of total labour input according to their shares of total labour hours.

In preparing the index of capital input, four types of capital inputs were taken : non-farm residential structures, other structures and equipment, inventories, and US international assets. Each was weighted by its own base year returns in estimating its contribution to growth.

The index of the contribution of increase in output per unit of input comprised advances in knowledge, resource shift from agriculture to industry and economies of scale.

Table 1 : Sources of Growth of Real National Income of the US: 1929-57

Source of Growth	*Percentage Points in Growth Rate*	*Percent of Growth Rate*
1 Real National Income	*2.93*	100.0
Increase in Total Inputs	*2.00*	68.3
(a) Labour	1.57	53.6
Employment	1.00	34.1

2	Hours (adjusted for quality change)	(-) .20	(-) 6.8
	Age-sex composition	(-) .01	(-) 0.3
	Education	0.67	22.9
	Others	0.11	3.75
	(b) Capital	0.43	14.7
	(c) Land	0.00	0.00
	Increase in Output per unit of Input	0.93	31.7
	(a) Advance in Knowledge	0.59	20.1
3	*(b)* Resource Shift	0.07	2.4
	(c) Economies of Scale	0.34	11.6
	(d) Irregular Factors	(-) 0.07	(-) 2.4

Table 1 reveals that the growth rate of real national income was 2.93 per cent per annum for the period 1929-57 in the US. The growth rate is calculated from the net national product at factor cost measured at base year prices. Of the 2.93 per cent growth rate, 2 percentage points are accounted for by increase in total inputs and 0.93 percentage points by increase in output per unit of input (or productivity). Of the 2.0 percentage points, 1.57 percentage points are accounted for by labour and 0.43 percentage points by capital.

Labour Input. Increase in labour input by 1.57 percentage points or 54 per cent per annum was adjusted for "quality" changes which include increase in employment by 1 percentage point (or 34 per cent) and the effect of shorter hours on the quality of a man-year's work as (-) 0.20 percentage point. The effect of hours worked is shown as a negative item because labour hours had decreased since 1929. The contribution of education to the annual growth rate was 0.67 percentage point (or 23 per cent), and 0.11 percentage point contribution of increased experience and better utilisation of women workers. Another item in labour input is changes in age-sex composition of labour force, shown as (-) 0.01 percentage point.

Capital Input. The contribution of capital input to the US growth rate was 0.43 percentage point or 15 per cent. Denison takes four types of capital input which are non-farm residential structures and equipment with a contribution of 0.05 percentage point; other structures and equipment with 0.28 percentage point; inventories with 0.08 percentage point; and US international assets with 0.02 percentage point (not shown in the Table).

Output Per Unit of Input. The contribution of increases in output per unit of total input to the US growth in national income was 0.93 percentage point or 32 per cent. This is the residual factor, according to Denison. He divides the increase in output per unit of input into three main components which include advance in knowledge, resource shifts from agriculture to industry, and economies of scale. Thus of the 0.93 percentage point (or 32 per cent) contribution of increase in productivity in the US for 1929-57, the contribution of advance in knowledge was 0.59 percentage point (or 20 per cent); of resource shifts from agriculture to industry was 0.7 percentage point; and of economies of scale 0.34 percentage point (or 12 per cent).

Denison distinguishes between advance in knowledge and education. The former factor accounted for 20 per cent of the total growth in national income in the US for 1929-57 and the latter factor for 23 per cent. According to him, the contribution of education increases the quality of labour force while advance in knowledge is a technical change. Denison regards advance in knowledge as the "true residual" and education as "guesstimated". So far as other factors like resource shifts from agriculture to industry and economies of scale are concerned, they tend to lower the size of the "true residual." Despite Denison's distinction between advance in knowledge and education, if advance in knowledge is considered as part of the contribution of education in the broad sense, it can be said that the contribution of education to the US growth rate was 43 per cent for 1929-57.

ITS CRITICISMS

Denison's analysis of the sources of growth differs from that of Solows in many respects. Solow attributes the residual to technical change. But Denison breaks the residual into further components. He attributes increase in growth to improvement in the quality of labour force as a consequence of better and more education. He disaggregates labour and capital inputs and gives separate estimates of the effect of change in age-sex composition of the labour force and of various types of capital.

However, Denison has ben criticised for the following weaknesses in his study:

1. Economists have questioned the effect of education on earnings which is the index of quality of labour. They find the adjustment factor of 40 per cent

for ability, leaving 60 per cent of differences in income differentials due to differences in years of schooling as arbitrary. Denison himself admits that a good deal of "guesstimating" is involved when he calculates the contribution of education to growth on these assumptions.

2. Lundberg[3] has criticised the use of the Cobb-Douglas production function by Denison for calculating the contribution of factor inputs to growth rate of national income. According to him, the specific Cobb-Douglas production function attributes large share of labour income, 75 per cent, gives this factor its subordinate position and instead permits more room for the residual. He further points out that a static equilibrium concept like the production function is a doubtful tool for analysing the dynamics of growth.

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3. E. Lundberg, in John Vaizey (cd.), *The Residual Factor and Economic Growth*,1964.

3. Sen finds "an internal inconsistency in Denison's simultaneous use of the assumptions of marginal productivity theory of distribution and persistent economies of large scale, when all economies are internal."[4]

4. Again, Denison's estimates are based on constant returns to scale which are available after making payments to all factors according to their marginal products. Consequently, the growth rate of real output either increases more than the growth rate of factor input or deceases.

5. Denison has been criticised for assuming "disembodied technical" progress. In fact, technical progress should be "embodied" in plant and equipment. According to J. Sandee, "The believer in "embodied" progress usually finds atleast twice the yield deduced by the classical Cobb-Douglas cum disembodied trend analyst, because he considers the whole "residual" (and some of Denison's other effects) as the result of new investment."[5]

6. Denison does not take into account the joint effects of capital and technology. Rather, he treats them as separate elements and does not attribute technical progress to the extra capital.

Conclusion. Despite these criticisms, "Denison has performed an extremely useful task in quantifying the contribution of increase in physical inputs to

growth.. „and that his estimates can be accepted with some degree of confidence. His attempt to quantify the sources of increases in output per unit of input, however, falls short of complete success, and some of his conclusions must be considered of doubtful worth. . . .The residual factor in economic growth remains the "coefficient of our ignorance'."[6]

JORGENSON-GRILICHES' SOURCES OF GROWTH

Jorgenson and Griliches [7] in their study of the sources of economic growth in the US private domestic sector economy examined a hypothesis concerning the explanation of changes in total factor productivity (TFP). The hypothesis is that if quantities of output and input are measured accurately, growth in total output is largely explained by growth in total input. The rate of growth of TFP is the difference between the rate of growth of real product and the rate of growth of real factor input. Within the framework of social accounting, the hypothesis is that if real produce and real factor input are accurately accounted for, the observed growth in TFP is negligible.

According to Jorgenson and Griliches, in their system of social accounting for real product and real factor input, there are many sources of error that frequently creep into the measurement of movements in TFP which bias the estimates upwards. They are (1) errors of aggregation; (2) errors of measurement in the prices of investment goods; (3) errors in relative utilisation of labour and capital stock; (4) errors in aggregation of capital services; and (5) errors in aggregation of labour services.

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4. A.K. Sen (ed.), *Growth Economics,* 1970.

5. In John Vaizey (ed.). *op. cit.*

6. A.P. Thirlwall, *Growth and Development,* 3/e, 1983.

7. D.W. Jorgenson and Z. Griliches. 'The Explanation of Productivity Change," *R.E.S.*, July, 1967.

MEASUREMENT OF SOURCES OF GROWTH

In order to prove their hypothesis, Jorgenson and Griliches first constructed the indices of total output and total input for the US for the period 1945-65

without correcting for errors of measurement. As an initial index of total output, they take the US domestic private product in constant prices. For an index of total input, they take the sum of labour and capital services in constant prices. Labour and capital services are assumed to be proportional to stocks of labour and capital respectively. The stock of labour is taken as the number of persons engaged in the private domestic sector of the US economy. The stock of capital is the sum of land, plant, equipment and inventories employed in this sector. The rate of growth of TFP is equal to the difference in rates of growth of total output and total input. They found that the average annual growth rate of total output over the period 1945-65 was 3.49 per cent; the average rate of growth of total input 1.83 per cent; and the average rate of growth of TFP as 1.60 per cent. Thus the growth rate of total input was 52.4 per cent of the growth in output and the remainder 47.6 per cent was explained by changes in TFP.

ELIMINATION OF ERRORS

After these initial estimates of growth rates of output, input and TFP, Jorgenson and Griliches eliminated the errors of aggregation and errors of measurement and reached the estimates shown in Table 2.

Table 2 : Total Output, Input and Factor Productivity of U.S. 1945-65

Estimates	*Average Annual Growth Rates* (Percentage)			*Col.* (3/2)%	*Change* in
	Output	*Input*	*TFP*		*TFP(%)*
(1)	(2)	(3)	(4)	=(5)	(6)
1. Initial	3.49	1.83	1.60	52.4	47.6
After correction for :					
2. Errors of Aggregation	3.39	1.84	1.49	54.3	45.7
3. Errors in Investment Goods Prices	3.59	2.19	1.41	61.0	39.0
4. Errors in Relative Utilisation	3.59	2.57	0.96	71.6	28.4
5. Erros in Aggregation of Capital Services	3.59	2.97	0.58	82.7	17.3
6. Errors in Aggregation					

of Labour Services	3.59	3.47	0.10	96.7	3.3

column (5) and (6) calculated from Table 9 of J&G.

Errors of Aggregation. The average annual rate of growth of total output for 1945-65 after the elimination of errors of aggregation of consumption and investment goods output comes to 3.39 per cent. The average rate of growth of *total input* after elimination of labour and capital services is 1.84 per cent and of TFP is 1.49 per cent. With errors eliminated, total input explains 54.3 per cent of the growth in total output and the remainder 45.7 per cent is explained by changes in TFP.

Errors in Investment Goods Prices. By eliminating the errors of measurement of investment goods prices for 1945-65, the average growth rate of total output is 3.59 per cent. The average rate of growth of total input is 2.19 per cent and of TFP is 1.41 per cent. Thus with errors in measurement of the prices of investment goods eliminated, the growth rate of total input to total output is 61 per cent, leaving 39 per cent due to TFP.

Errors in Relative Utilisation of Labour and Capital Stock. By eliminating errors in the measurement of relative utilisation of labour and capital stock, the average annual growth rate of total output is 3.59 per cent. The average growth rate of total input is 2.57 per cent and of TFP is 0.96 per cent. Now the total input explains 71.6 per cent of the rate of growth in total output, leaving the remainder 28.4 per cent due to TFP.

Errors in Aggregation of Capital Services. When errors in aggregation of capital goods are eliminated, the average annual growth rate of total output for 1945-65 is 3.59 per cent. The average growth rate of total input is 2.97 per cent, and of TFP is 0.58 per cent. With these errors eliminated, total input explains 82.7 per cent of the growth in total output, leaving 17.3 per cent due to TFP.

Errors in Aggregation of Labour Services. By eliminating errors in aggregation of labour services, the average annual growth rate of total output for 1945-65 is again 3.59 per cent. The average growth rate of total input is 3.47 per cent and of TFP is 0.10 per cent.

Conclusion. Thus after making corrections for aggregation errors and measurement errors, Jorgenson and Griliches find that 96.7 per cent of the rate of growth of the US output over the period 1945-65 is explained by the growth in input, leaving only 3.3 per cent due to change in TFP or residual. The latter is in marked contrast to 47.6 per cent before correction of data.

ITS CRITICISMS

Jorgenson and Griliches present more realistic estimates of the sources of growth of the US economy than given by Denison. They correct changes in TFP for errors in aggregation and in measurement of output, capital services and labour services, while Denison corrects only for errors in the measurement of labour services. By eliminating aggregation errors and measurement errors, Jorgenson and Griliches have shown that the residual or change in TFP is very small, 3.3 per cent, as compared with Denison's 20 per cent due to advance in knowledge.

However, certain economists do not accept the Jorgenson-Griliches view when the latter attribute virtually the whole of measured growth to increases in factor inputs.

In his review of the Jorgenson-Griliches study, Denison [8] claims that their extremely low estimate of change in TFP is almost entirely due to the wholly unwarranted adjustment to the capital utilisation series.

He further points out that very little of the difference between the results of Jorgenson and Griliches and traditional estimates of the TFP growth is accounted for by the removal of "errors" in the output series.

Jorgenson and Griliches themselves point out that the most serious weakness of their study is in the use of long-term trends in the relative utilisation of capital and labour to adjust capital input and labour input to year-to-year variations. As a result of discrepancies between them, substantial errors of measurement have remained in the index of TFP.

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8. E.F. Denison. "Some Major Issues in Productivity Analysis," *S.C.B.*, May, 1969.

CHAPTER

The New Endogenous Growth Theory

INTRODUCTION

The new endogenous growth theory was developed as a reaction to omissions and deficiencies in the Solow-Swan neoclassical growth model. To understand the unique features of the new growth theory. *First*, we study the Solow-Swan model. *Second*, the convergence-divergence controversy based on the implications of this model and *Third*, we explain the endogenous growth theory with reference to the ideas of the principal proponents of this theory.

THE SOLOW-SWAN MODEL[1]

The Solow-Swan model of economic growth postulates a continuous production function linking output to the inputs of capital and labour which leads to the steady state equilibrium of the economy. It is based on the following assumptions:

(1) One composite commodity is produced.

(2) Output is regarded *net* output after making allowance for the depreciation of capital.

(3) There are constant returns to scale.

(4) There are diminishing returns to an individual input.

(5) The two factors of production—labour and capital—are paid according to their marginal physical productivities.

(6) Prices and wages are flexible.

(7) There is perpetual full employment of labour.

(8) There is also full employment of the available stock of capital.

(9) Labour and capital are substitutable for each other.

(10) There is no technical progress.

(11) The saving ratio is constant.

(12) Saving equals investment.

(13) Capital depreciates at the constant rate, *d*.

(14) Population grows at a constant rate, *n*.

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1. R.M. Solow, "A Contribution to the Theory of Economic Growth," *Q.J.E., 70* Feb., T.W. Swan, "Economic Growth and Capital Accumulation," *Economic Record*, 32, Nov. 1956.

THE MODEL

Given these assumptions, with unchanging technical progress, the production function is

$$Y = F(K,L)$$

where, Y is income or output, K is capital and L is labour. The condition of constant returns to scale implies that if we divide by L, the production function can be written as

$$Y / L = F(K/L,1) = L.f(k) \qquad ...(1)$$

where, $Y = Y/L$ is output or income per worker, $k = K/L$ is the capital-labour ratio, and the function $f(k) = f(k, 1)$. Thus the production function can be expressed as

$$y = f(k) \qquad ...(2)$$

In the Solow-Swan model, saving is a constant fraction, *s*, of income. So saving per worker is *sy*. Since income equals output,

$$sy = sf(k) \qquad ...(3)$$

The investment required to maintain capital per worker *k*, depends on population growth, and the depreciation rate, *d*. Since it is assumed that population grows at a constant rate *n*, the capital stock grows at the rate *n.k* to provide capital to the growing population. Since depreciation is a constant, *d*, per cent of the capital stock, *d. k* is the investment needed to replace worn-out capital. This depreciation investment per worker *d.k* is added to *n.k*, the investment per worker to maintain capital-labour ratio for the growing population,

$$(nk + dk) = (n + d)k \qquad ...(4)$$

which is the investment required to maintain capital per worker.

The net change in capital per worker (capita labour ratio) $\dot{k}$ overtime is the excess of saving per worker over the required investment to maintain capital per worker,

$$\dot{k} = sf(k) - (n + d)k \qquad ...(5)$$

This is the fundamental equation for the Solow-Swan model, where the steady state corresponds to $\dot{k} = 0$. The economy reaches a steady state when

$$sf(k) = (n + d)\, k \qquad ...(6)$$

The Solow-Swan model is explained in Fig. 1.

Output per worker *y* is measured along the vertical axis and capital per worker (capital-labour ratio), *k*, is measured along the horizontal axis. The $y = f(k)$ curve is the production function which shows that output per worker increases at a diminishing rate as *k* increases due to the law of diminishing returns. The $sf(k)$ curve represents saving per worker. The $(n + d)k$ is the investment requirement line from the origin with a positive slope equal to $(n+d)$. The steady state level of capital, $\dot{k}$ is determined where the $sf(k)$ curve intersects the $(n+d)k$ line at point *E*. The steady state income is $\dot{y}$ with output per worker $\dot{k}$ *P*, as measured by point *P* on the production function $y = f(k)$.

In order to understand why $\dot{k}$ is a steady state situation, suppose the economy starts at the capital-labour ratio k_1. Here saving per worker k_1B exceeds the investment required to keep the capital-labour ratio constant, k_1A, ($k_1B > k_1A$). Thus, k and y increase until $\dot{k}$ is reached when the economy is in the steady state at point E. Alternatively, if the capital-labour ratio is k_2, the saving per worker, k_2C, will be less than the investment required to keep the capital-labour ratios constant, k_2D, ($k_2C < k_2D$). Thus y will fall as k falls to $\dot{k}$ and the economy reaches the steady state E.

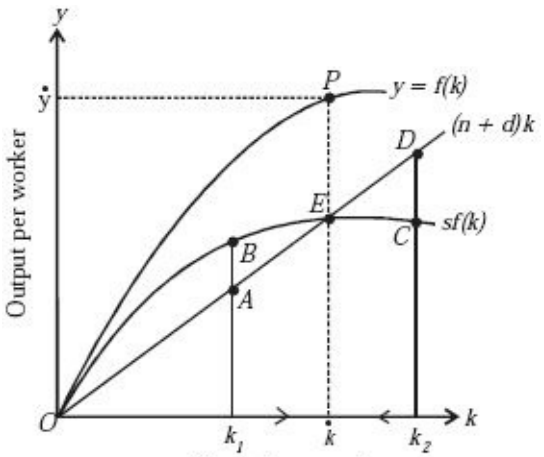

Fig. 1

The Solow-Swan model shows that the growth process is stable. No matter where the economy starts, forces exist that will push the economy over time to a steady state.

GROWTH WITH SAVING

An important conclusion of the Solow-Swan model is that the growth rate does not depend upon the saving rate. In the steady state, both k and y being constant, the growth rate is not affected by the saving rate. This is explained in Fig. 2 where $\dot{k}$ is the steady state capital per worker and $\dot{y}$ is output per worker when the $sf(k)$ curve intersects the $(n+d)\dot{k}$, curve at point E. An increase in the saving rate from s to s_1 shifts the saving curve $sf(k)$ upward to $s_1f(k)$. The new steady state point is E_1.

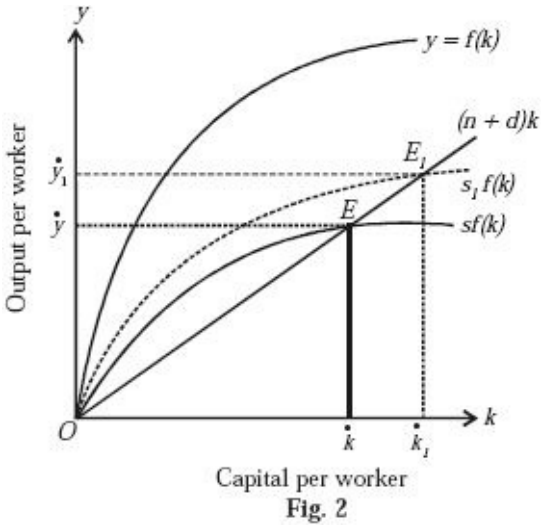

Fig. 2

When the saving rate increases froms s to s_1 with no change in the growth rate of labour force (n), the capital per worker will continue to rise to $\dot{k}_1$ which

will raise output per worker to $\dot{y}_1$ and so will the growth rate of output increase. But this process continues at a diminishing rate in the transition period. As a result, the initial growth rate of output is restored over the long run at the new steady state equilibrium point E_1, where $(n + d)k = s_1 f(k)$.

After this point, there will be no further increase in output per worker because the growth rate of labour force (n) does not change and the long-run growth rate of output also remains at the same level.

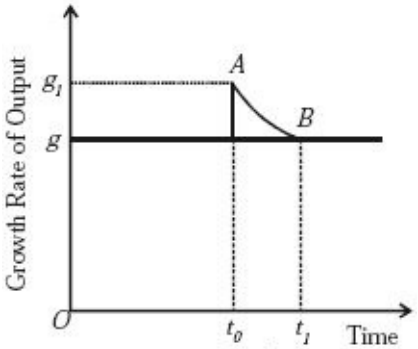

Fig. 3

Fig. 3 depicts the effect on the growth rate of output when there is increase in the saving rate. The saving rate increases at time t_0. Initially, the growth rate of output rises from g to g_1. This is the transition period in which output per worker is increasing from $\dot{y}$ to $\dot{y}_1$ and capital per worker from $\dot{k}$ to $\dot{k}_1$, as shown in Fig.2, but at time t_1, the initial equilibrium growth rate is restored with the fall in the growth rate of output from point A to B.

IMPLICATIONS OF THE MODEL

There are some important implications or predictions of the Solow-Swan model of growth:

1. The growth rate of output in steady state is exogenous and is independent of the saving rate and technical progress.

2. If the saving rate increases, it increases the output per worker by increasing the capital per worker, but the growth rate of output is not affected.

3. Another implication of the model is that growth in per capita income can either be achieved by increased saving or reduced rate of population growth. This will hold if depreciation is allowed in the model.

4. Another prediction of the model is that in the absence of continuing improvements in technology, growth per worker must ultimately cease. This prediction follows from the assumption of diminishing returns to capital.

5. This model predicts conditional convergence. All countries having similar characteristics like saving rate, population growth rate, technology, etc. that affect growth will converge to the same steady state level. It means that poor countries having the same saving rate and level of technology of the rich countries will reach the same steady state growth rates in the long run.

THE CONVERGENCE-DIVERGENCE CONTROVERSY

One of the important predictions (or implications) of the Solow-Swan neo-classical growth model is that of convergence. Convergence is the process of "catching up" of one economy with another economy. The growth convergence prediction has been the focus of extensive empirical research in the 1990s. This led to a debate about the convergence or divergence of GNP per capita over time across economies based on diverse data sets of countries on a comparable basis. We discuss this controversy in the light of the new empirical growth literature. Convergence of growth is of two types : (1) Absolute or unconditional convergence, and (2) conditional convergence.

1. ABSOLUTE OR UNCONDITIONAL CONVERGENCE

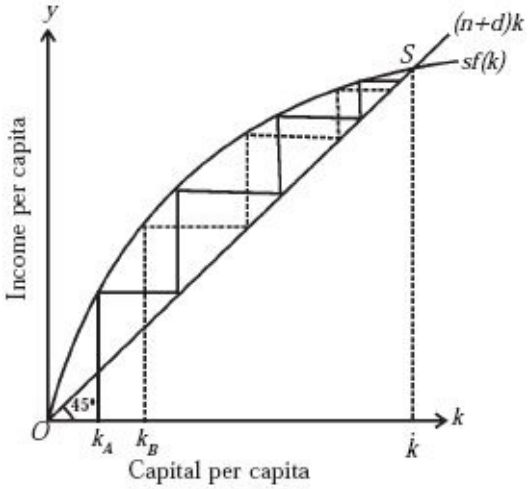

Fig. 4

If two closed countries have the same saving rate, the same rate of population growth, the same depreciation rate of capital and the same production function, they will have the same steady state values of capital per capita and income or output per capita. But the country with low levels of capital per capita and income per capita will grow faster and eventually catch up (or converge) with other country having high levels of capital per capita and income per capita. In other words, when a poor country with low level of income per capita tends to grow faster than a rich country with high level of income per capita, it is called absolute or unconditional convergence. The concept of absolute convergence is explained in Fig. 4 where the 45° line represents the steady state condition. The steady state level $\dot{k}$ is determined at the intersection of the *sf(k)* curve with the $(n + d)k$ line. Suppose there are two

countries *A* and *B* having the same values of the parameters *s, n, d* and *f(k).* But country *A* starts with an initial lower stock of capital k_A and *B* with initial higher stock of capital k_B. The zigzig portion of the figure shows that country *A* with an initial lower capital stock grows faster than country *B* with an initial higher capital stock, as shown by the dotted zigzig curve. Eventually, country *A* catches up or converges to the latter at point *S* where both the countries are at a steady state position $\dot{k}$. Thus absolute convergence shows a negative relationship between growth rate of income per capita and initial level of income per capita.

EMPIRICAL EVIDENCE

A number of economists, among them Barro, Baumol, DeLong, and Barro and Sala-i-Martin, have empirically tested the absolute convergence hypothesis on the basis of statistical relationship between the growth rate of income per capita and the initial level of income per capita. Most have concluded that the hypothesis does not hold in the case of majority of countries.

Based on the Maddison data for 16 countries from 1870 to 1979, Baumol found that poor countries like Italy and Japan caught up with the income per capita of rich countries like Canada and the United States during these years. But Abramovitz found that income per capita tended to diverge between 1870 and 1950. DeLong also found that GNP per capita did not converge over time.

Taking the broad sample of countries in the Heston-Summers data for 1960 to 1985, Romer concluded that poor countries in this sample did not grow faster than the rich countries. Similarly, Barro and Sala-i-Martin from a sample of 118 countries found that the average growth rate of GDP per capita had little relation with the 1960 level for real GDP per capita. Rather, there was “a tendency for the initially richer countries to grow faster in per capita terms.” They also took a sample of 20 member countries of OECD (Organisation for Economic Cooperation and Development) and observed that poorer countries among them in 1960 caught up with relatively advanced countries in terms of real GDP per capita from 1960-85. Thus the empirical evidence about the absolute convergence hypothesis varies from economist to economist even when different samples of the same data are taken.

2. CONDITIONAL CONVERGENCE

If the parameters like rates of saving, population growth, etc., differ across countries, their steady state positions will also differ. But over time their growth rates will eventually equalise or converge.

This convergence is conditional because the steady state levels of capital per capita and income per capita depend on the saving rate, rate of population growth and the position of the production function that differ across countries. Thus countries will converge on the condition that the characteristics that affect their growth rates are similar. This means that if some additional variables as level of education, political stability, etc. are also included, we can explain differences in growth rates among countries. For example, if a country has a poor educational system or unstable political system, its low growth rate can persist, despite its low level of capital per capita and income per capita.

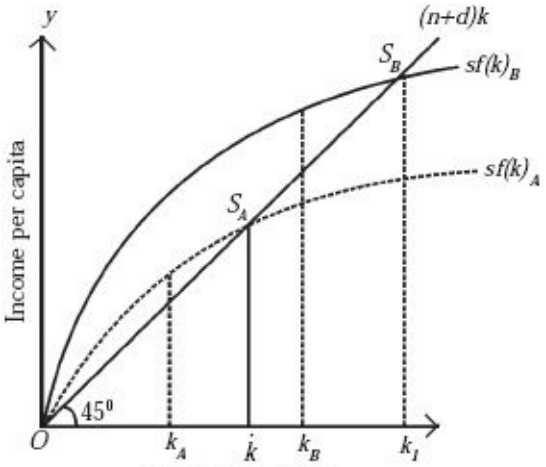

Fig. 5

The concept of conditional convergence is explained in Fig. 5 with reference to two countries, a poor country *A* and a rich country *B*. They have different initial stocks of capital per capita and different saving rates that lead to different steady state positions. The capital per capita stock of *B* country is greater than that of *A* country, $k_B > k_A$, and its saving function is also higher than that of *A* country, $sf(k)_B > sf(k}_A$. The steady state position of country *B* is determined by the intersection of the $sf(k)_B$ curve with 45° line at point S_B and that of county *A* at points S_A with the intersection of $sf(k)_A$ curve with the 45° line.

This shows that a rich country with higher saving rate and higher stock of capital per capita grows at a faster rate than a poor country with lower saving rate and lower stock of capital per capita.

EMPIRICAL EVIDENCE

Barro, Baumol, Dowrick and Nguyen, Barro and Sala-i-Martin and other economists have tested empirically the conditional convergence hypothesis on the basis of cross-sectional data.

The various findings look empirically at the different variables like rates of saving, population growth, etc. and the influence of various government policies, etc. as proxies to explain differences in steady state positions.

Barro has shown that countries that invest more tend to grow faster but the impact of higher investment on growth appears to be transitory because such countries will have higher income per capita, but not higher growth rate. This suggests that countries converge conditionally.

Barro and Sala-i-Martin in their empirical analysis of cross-section of countries based on different variables like eduction, population growth, government policies, etc. found that growth rates per capita differ enormously across countries over long periods of time. On the basis of data for 122 countries from 1965-85, they concluded that the dispersion of real GDP per capita across a group of economies tends to fall over time and that the cross-country data support the conditional convergence hypothesis.

Similarly, Dowick in his study of 113 countries between 1960-64 and 1984-88 found diverging growth paths of GDP per capita across countries. By decomposing observed growth rates of GDP per capita into four elements, he found that the richer countries, in terms of GDP per capita, have been growing faster than the middle-income countries, which in turn, have outplaced the poorest countries. This has been due to lower rates of investment and labour force participation in the poorest countries compared to richer countries. This supports the conditional convergence hypothesis.

Take the case of the “Asian Tigers” as the unusual example of the conditional convergence hypothesis. Alwyn Young has shown that there is a mystery about their rapid growth. Hongkong, Singapore, South Korea, and Taiwan had remarkably high growth between 1966-90. Their rapid growth is measured by increased inputs: labour via increase in participation rates, capital via high saving and investment rates, and human capital via substantial expenditure on education. With the rapid growth of these inputs, Young shows that the growth of output in these countries converges to those of rich advanced countries.

Maddison's long-term data for 16 currently developed countries for 1870-1990 show that real GDP per capita does not converge over time. But there was a steady growth of real GDP per capita overtime in the majority of countries, with stagnations and booms in Japan and Australia. For 15 currently less developed countries, the data for 1900-1987 show that real GDP per capita was stagnant in many countries, including Korea and the Philippines from 1913 to 1950; India, Indonesia, China, Pakistan, Thailand and Taiwan from 1900 to 1950; and Bangladesh which experienced stagnant or declining GNP per capita levels for almost the entire century.

CONCLUSION

The various empirical studies show that absolute convergence cannot be a powerful force in the world, otherwise the poorest countries would be growing very rapidly. In fact, poor countries remain poor and some even decline in absolute terms. Apart from the Asian Tigers, the convergence between poor and advanced countries has been limited or absent. As a result, there is growing evidence of divergences in GDP per capita across economies.

THE ENDOGENOUS GROWTH THEORY

The endogenous growth theory is a new theory which explains the long-run growth rate of an economy on the basis of endogenous factors as against exogenous factors of the neoclassical growth theory. The Solow-Swan neoclassical growth model explains the long-run growth rate of output based on two exogenous variables: the rate of population growth and the rate of technological progress, and that is independent of the saving rate. As the long-run growth rate depended on exogenous factors, the neoclassical theory had few policy implications. As pointed out by Romer, "In models with exogenous technical change and exogenous population growth, it never really mattered what the government did.' The new growth theory does not simply criticise the neoclassical growth theory. Rather, it extends the latter by introducing endogenous technical progress in growth models. The endogenous growth models have been developed by Arrow[1], Romer[2] and Lucas[3], among other economists. We briefly study their main features, criticisms and policy implications.

THE ENDOGENOUS GROWTH MODELS

The endogenous growth models emphasise technical progress resulting from the rate of investment, the size of the capital stock, and the stock of human capital.

Assumptions:

The new growth theories are based on the following assumptions :

1. There are many firms in a market.

2. Knowledge or technological advance is a non-rival good.

3. There are increasing returns to scale to all factors taken togather and constant returns to a single factor, at least for one.

4. Technological advance comes from things people do. This means that technological advance is based on the creation of new ideas.

5. Many individuals and firms have market power and earn profits from their discoveries. This assumption arises from increasing returns to scale in production that leads to imperfect competition.

As a matter of fact, these are the requirements of an endogenous growth theory.

Given these assumptions, we explain the three main models of endogenous growth.

1. ARROW'S LEARNING BY DOING AND OTHER MODELS

The Arrow Model. Arrow was the first economist to introduce the concept of learning by doing in 1962, by regarding it as endogenous in the growth process. His hypothesis was that at any moment of time new capital goods incorporate all the knowledge then available based on accumulated experience, but once built, their productive deficiencies cannot be changed by subsequent learning. Arrow's model in a simplified form can be written as

$$Y_i = A(K)\ F\ (K_i, L_i\ )$$

where, Y_i denotes output of firm *i*, K_1 donates its stock of capital, L_i denotes its stock of labour, *K* without a subscript denotes the aggregated stock of capital and *A* is the technology factor. He showed that if the stock of labour is held constant, growth ultimately comes to a halt because socially very little is invested and produced. Therefore, Arrow did not explain that his model could lead to sustained endogenous growth.

The Levhari-Sheshinski Model. Arrow's model has been generalised and extended by Levhari and Sheshinski. They emphasised the spillover effects of increased knowledge as the source of knowledge. They assume that the source of knowledge or learning by doing is each firm's investment. An increase in a firm's investment leads to a parallel increase in its level of knowledge. Another assumption is that the knowledge of a firm is a public good which other firms can have at zero cost. Thus knowledge has a non-rival character which spillsover across all the firms in the economy. This stems from the fact that each firm operates under constant returns to scale and the economy as a whole is operating under increasing returns to scale.

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1. Kenneth J. Arrow.'The Economic Implications of Learning by Doing," *R.E.S.*, June, 1962.

2. Paul M. Romer, "Increasing Returns and Long-run Growth," *J.P.E.,* October, 1986; indogenous Technological Chanc," J.P.E., October, 1990.

3. Robert E. Lucas, Jr., "On the.Mechanics of Economic Development," *Journal of Monetary Economics,* July, 1988.

In the Levhari-Sheshinski Model, endogenous technical progress in terms of knowledge or learning by doing is reflected in an upward raising of the production function and economic growth is explained "in the context of aggregate increasing returns being consistent with competitive equilibrium."

The King-Robson Model. King and Robson emphasise *learning by watching* in their technical progress function. Investment by a firm represents innovation to solve the problems it faces. If it is successful, the other firms will adapt the innovation to their own needs. Thus externalities resulting from learning by watching are a key to economic growth. The King and Robson study shows that innovation in one sector of the economy has the contagion or

demonstration effect on the productivity of other sectors, thereby leading to economic growth. They conclude that multiple steady state growth paths exist, even for economies having similar initial endowments, and policies that increase investment should be pursued.

The Romer Model. Romer in his first paper on endogenous growth in 1986 presented a variant on Arrow's model which is known as *learning by investment*. He assumes creation of knowledge as a side product of investment. He takes knowledge as an input in the production function of the following form

$$Y = A(R)F(R_i , K_i , L_i)$$

where, Y is aggregate output; A is the public stock of knowledge from research and development R; R_i is the stock of results from expenditure on research and development by firm i; and K_i and L_i are capital stock and labour stock of firm i respectively.

He assumes the function F homogeneous of degree one in all its inputs R_i , K_i and L_1, and treats R_1 as a rival good.

Romer took three key elements in his model, namely externalities, increasing returns in the production of output and diminishing returns in the production of *new knowledge*. According to Romer, it is spillovers from research efforts by a firm that leads to the creation of new knowledge by other firms. In other words, new research technology by a firm spillsover instantly across the entire economy.

In his model, new knowledge is the ultimate determinant of long-run growth which is determined by investment in research technology. Research technology exhibits diminishing returns which means that investments in research technology will not double knowledge. Moreover, the firm investing in research technology will not be the exclusive beneficiary of the increase in knowledge. The other firms also make use of the new knowledge due to the inadequacy of patent protection and increase their production. Thus the production of goods from increased knowledge displays increasing returns and competitive equilibrium is consistent with increasing aggregate returns

owing to externalities. Thus Romer takes investment in research technology as endogenous factor in terms of the acquisition of new knowledge by rational profit maximisation firms.

2. THE LUCAS MODEL

Uzawa developed an endogenous growth model based on investment in human capital which was used by Lucas. Lucas assumes that investment on education leads to the production of human capital which is the crucial determinant in the growth process. He makes a distinction between the *internal effects* of human capital where the individual worker undergoing training becomes more productive, and *external effects* which spillover and increase the productivity of capital and of other workers in the economy. It is investment in human capital rather than physical capital that has spillover effects that increase the level of technology. Thus the output for firm *i* takes the form

$$Y_i = A\,(K_i)\,.\,(H_i).H^e$$

where, *A* is the technical coefficient, K_i and H_i are the inputs of physical and human capital used by firms to produce goods Y_i . The variable *H* is the economy's average level of human capital. The parameter *e* represents the strength of the external effects from human capital to each firm's productivity.

In the Lucas model, each firm faces constant returns to scale, while there are increasing returns for the whole economy. Further, learning by doing or on-the-job training and spillover effects involve human capital. Each firm benefits from the *average* level of human capital in the economy, rather than from the *aggregate* of human capital. Thus it is not the accumulated knowledge or experience of other firms but the average level of skills and knowledge in the economy that are crucial for economic growth. In the model, technology is endogenously provided as a side effect of investment decisions by firms. Technology is treated as a public good from the point of view of its users. As a result, firms can be treated as price takers and there can be an equilibrium with many firms as under perfect competition.

3. ROMER'S MODEL OF TECHNOLOGICAL CHANGE

Romer's model of *Endogenous Technical Change* of 1990 identifies a research sector specialising in the production of ideas. This sector invokes human capital alongwith the existing stock of knowledge to produce ideas or new knowledge. To Romer, ideas are more important than natural resources. He cites the example of Japan which has very few natural resources but it was open to new western ideas and technology. It imported machines from the United States during the Meija era, dismantled them to see how they worked and manufactured their better prototypes. Therefore, ideas are essential for the growth of an economy. These ideas relate to improved designs for the production of producer durable goods for final production.

In the Romer model, new knowledge enters into the production process in three ways. A new design is used in the intermediate goods sector for the production of a new intermediate input. In the final sector, labour, human capital and available producer durables produce the final product. And a new design increases the total stock of knowledge which increases the productivity of human capital employed in the research sector.

ITS ASSUMPTIONS

The Romer model is based on the following assumptions :

1. Economic growth comes from technological change.

2. Technological change is endogenous.

3. Market incentives play an important role in making technological changes available to the economy.

4. Invention of a new design require an specified amount of human capital.

5. The aggregate supply of human capital is fixed.

6. Knowledge of a new design is assumed to be *partially excludable* and *retainable* by the firm which invented the new design. It means that if an inventor has a patented design for a machine, no one can make or sell it without the agreement of the inventor. On the other hand, other inventors are free to spend time to study the patented design for the machine and acquire

knowledge that helps in the design of such a machine. Thus patents provide incentives to firms to engage in research and development, and other firms can also benefit from such knowledge. When there is partial excludability, investment in research and development leading to an invention by a firm can only bring in quasi-rent.

7. Technology is a non-rival input. Its use by one firm does not prevent its use by another.

8. The new design can be used by firms and in different periods without additional costs and without reducing the value of the input.

9. It is also assumed that the low cost of using an existing design reduces the cost of creating new designs.

10. When firms make investments on research and development and invent a new design, there are externalities that are internalised by private agreements.

THE MODEL

Given these assumptions, the Romer model can be explained in terms of the following technological production function:

$$\Delta A = F(K_A, H_A, A)$$

where, ΔA is the increasing technology, K_A is the amount of capital invested in producing the new design (or technology), H_A is the amount of human capital (labour) employed in research and development of the new design, A is the existing technology of designs, and F is the production function for technology.

The production function shows that technology is endogenous when more human capital is employed for research and development of new designs, then technology increases by a larger amount i.e. ΔA is greater. If more capital is invested in research laboratories and equipments to invent the new design, then technology also increases by a larger amount *i.e.* ΔA is more. Further, the existing technology A, also leads to production of new technology, ΔA . Since it is assumed that technology is a non-rival input and partially excludable, there

are positive spillover effects of technology which can be used by other firms. Thus, the production of new technology (knowledge or idea) can be increased through the use of physical capital, human capital and existing technology.

CRITICISMS OF NEW GROWTH THEORY

Despite the fact that the New Growth Theory has been regarded as an improvement over the new classical growth theory, still it has many critics:

1 . According to Scott and Auerbach, the main ideas of the new growth theory can be traced to Adam Smith and increasing returns to Marx's analysis.

2. Srinivasan does not find any thing new in the new growth theory because increasing returns and endogeneity of variables have been taken from the neo-classical and Kaldor's models.

3. Fisher criticises the new growth theory for depending only on the production function and the steady state.

4. To Olson, the new growth theory lays too much emphasis on the role of human capital and neglects the role of institutions.

5. In the various models of new growth theory, the difference between physical capital and human capital is not clear. For instance, in Romer's model capital goods are the key to economic growth. He assumes that human capital accumulates and when it is embodied in physical capital then it becomes a driving force. But he does not clarify which is the driving force.

6. By using secondary school enrollment as a proxy for human capital in their model, Mankiw, Romer and Weil find that physical and human capital accumulation cannot lead to perpetual economic growth.

POLICY IMPLICATIONS OF NEW GROWTH THEORY

The New Growth Theory has important policy implications for both developed and developing economies:

1. The new growth theory suggests that convergence of growth rates per

capita of developing and developed countries can no longer be expected to occur. The increasing returns to both physical and human capital imply that the rate of return to investment will not fall in developed countries relative to developing countries. In fact, the rate of return to capital in developed countries is likely to be higher than that in developing countries. Therefore, capital need not flow from the developed to the developing countries and actually the reverse may happen.

2. Another implication is that the measured contribution of both physical and human capital to growth may be larger than suggested by the Solow residual model. Investment on education or research and development of a firm has not only a positive effect on the firm itself but also spillover effects on other firms and hence on the economy as a whole. This suggests that the residual attributed to technical change in the Solow growth accounting may be actually much smaller.

3. One of the important implications is that it is not necessary that economies having increasing returns to scale must reach a steady state level of income growth, as suggested by the Solow-Swan model. When there are large positive externalities from new investment on research and development, it is not necessary for diminishing returns to start. So the growth rate of income does not slow down and the economy does not reach steady state. But an increase in the saving rate can lead to a permanent increase in the growth rate of the economy.

4. This further implies that countries having greater stocks of human capital and investing more on research and development will enjoy a faster rate of economic growth. This may be one of the reasons for the slow growth rate of certain developing countries.

IMPLICATIONS FOR DEVELOPING COUNTRIES

There are certain important implications of the new growth theory for developing countries:

Grossman and Helpman have shown that potentially developing countries stand to gain more from trade with developed countries by drawing upon new knowledge, research and development and new technologies of developed

countries. This is possible with openness in trade which further offers opportunities to firms to participate in international capital markets for financing investment.

There are also varied policy implications for developing countries. The new growth theory emphasises the role of private firms for investment in technological research and development. But external increasing returns in such cases will be too low. Therefore, public policy can be more effective in making large provision for making investments in creating human capital and on research and development of new knowledge. This can help to increase the rate of accumulation of both physical and human capital and thus the long-run growth rate of developing countries. Lucas favours subsidies by the state or schooling in developing countries because investment in education has a spillover effect on the productivity of other people. He also advocates incentives to such firms which invest more on research and development of new technologies.

According to Shaw, if the state trade policies promote investment on research and development activities, the returns to them will rise because of the resulting technology in the manufacturing sector. Therefore, trade policies in developing countries should not provide protection to the manufacturing sector which promotes transfer of skilled labour from research activity into manufacturing.

CHAPTER

The Cambridge Capital Controversy in the Neo-classical Analysis of Growth

INTRODUCTION

In the 1950s a theoretical controversy raged between two groups of economists over capital theory in the neo-classical analysis of growth. One group of economists belonged to the British Cambridge School and the other of economists at the MIT (Massachusetts Institute of Technology) in Cambridge of America. The debate from the British Cambridge School revolves around Kaldor, Joan Robinson, Hicks, Champernowne and others including the Italian economists Garegnani and Nuti. On the U.S. Cambridge side, Samuelson and Solow have been the principal defenders of the neo-classical theory of capital.

THE CAPITAL CONTROVERSY

The capital controversy relates to the meaning of capital and the reward for the owners of capital. Historically, it goes back to Marx, Ricardo, Bohm-Bawerk, Clark and Wicksell. These economists regarded capital as a factor of production whose marginal productivity determines the reward in the form of profit accruing to its owners. Clark, in particular, conceptualised 'capital' as a single, homogeneous, malleable capital good and profit as the just reward for the owner of capital on the basis of the marginal productivity theory of distribution. Based on Clark's 'parables', modern neo-classical economists Solow, Joan Robinson, Samuelson and others apply the Clarkian conception of capital in one and two-sector models. *First,* alongwith the stock of labour employed, they plug capital into an aggregate production function to explain the determination of output. *Second,* on the basis of the marginal productivity

of capital, they determine the rate of profit and profit per man. All Cambridge economists do not agree that heterogeneous capital goods can be aggregated. However, it was from the publication of Joan Robinson's article of 1953[1] that the modern capital controversy began on the neo-classical conception of aggregate capital and the neo-classical aggregate production.

Before we discuss the controversy, it is essential to outline the neo-classical capital theory.

THE NEO-CLASSICAL CAPITAL THEORY

There are two types of neo-classical theories : of income distribution and growth. The former mainly depends upon the theory of production and the latter upon capital theory, the two being closely integrated. But in the ultimate analysis, the neo-classical growth theory depends upon capital theory.

The Cambridge capital controversy revolves around a one-sector (commodity) model associated with neo-classical growth theory. This is based on the concept of aggregate function.

ASSUMPTIONS

The neo-classical capital theory is based on the following assumptions :

(1) There is a perfectly competitive market.

(2) There is only one commodity (say corn) in terms of which both capital and output are taken, and is also a consumption goods.

(3) There are two inputs, capital *(K)* and labour (L) which produce output.

(4) There are only two classes. Capitalists who own capital and earn profit, and workers who supply labour and earn wages.

(5) The rate of return on capital is the profit or interest rate (r).

(6) The wage rate (w) varies inversely with the interest rate.

(7) The capital-labour ratio *(K/L* or *k)* varies directly with wage-interest rate ratio (w/r).

(8) Output per man *(Q/L* or *q)* varies inversely with the interest rate (r).

(9) There are constant returns to scale.

(10) The economy is closed with no foreign trade.

(11) It is a moneyless economy.

THE THEORY

Given these assumptions, the central concept of the theory is an aggregate production function

$$Q = F(K, L)$$

where, *Q* is total output, *F* is the production function, *K* is the single, homogeneous, malleable capital good, and L is homogeneous labour.

It is a homogeneous production function of degree one. It implies that given one production process (or technique), the use of more inputs, *K* and L, will lead to an increase in output. In the neo-classical theory, *F* is an increasing function of both *K* and *L*. Further, it displays constant returns to scale which means that a proportionate increase in both *K* and *L* leads to an increase of output in the same proportion.

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1. J. Robinson, "The Production Function and the Theory of Capital", *Review of Economic Studies,* 1953.

Two properties follow from constant returns to scale.

First, there is diminishing marginal product to each input. If, say, successive amounts of *K* are increased with fixed units of *L*, they will lead to less than proportionate increase in output.

The *second* property can be represented in per capita terms. An economy with the same capital per man will have the same output per man, although the

absolute level of output will depend upon the absolute amount of capital and number of workers. If we denote capital per man *(K/L)* by *k* and output per man *(Q/L)* by *q*, then the production function may be written as

$$q = f(k)$$

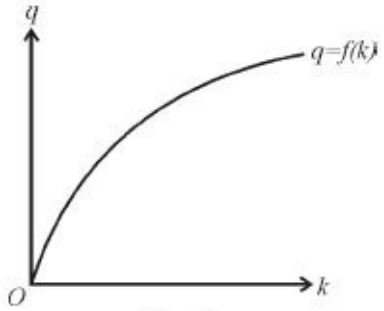

Fig. 1

The functional relationship between output per man *(q)* and capital per man *(k)* is shown in Fig.1. The concave slope of the curve *q = f(k)* shows the first property that an increase in capital per man leads to an increase in output per man but less than in proportion. As per the second property, if it is presumed that capital input is zero, then the output is also zero and no production takes place, $f(0) = 0$.

Having analysed the conditions of production in the neo-classical theory of capital, we study a theory of income distribution in a perfectly competitive market. The following propositions emerge from the neo-classical assumptions which show the distributive relationships as depicted in Fig. 2.

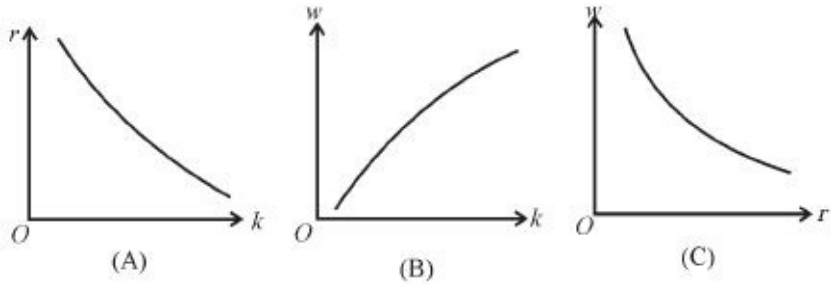

Fig. 2

(1) *r* (the rate of interest or profit) equals MP_k (marginal product of capital), because MP_k falls with increasing *k (K/L).* Therefore *r* will also fall with increasing *k.* Panel (A) of Fig. 2 shows *r* as a decreasing function of *k.*

(2) As output increases, MP_k will be low but the MP_L (marginal product of labour) will be high. Because MP_L is equal to the wage rate, higher *k (K/L)* leads to higher wage rate (*w*). Panel *(B)* shows that *w* is an increasing function of *k.*

(3) It follows from the above propositions that the wage rate (*w*) must vary inversely with the interest rate (*r*), as shown in panel *(C)*. Because an increase in *k* leads to a decline in *r* and an increase in *w*. Therefore, an increase in *r* leads to a decrease in *w* and vice versa.

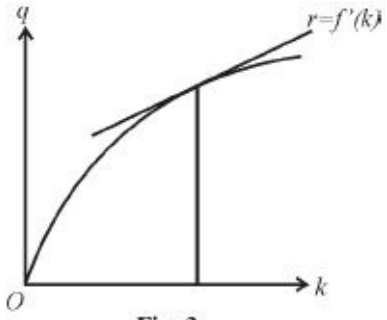

Fig. 3

The relationship between the various variables *r, w* and *k* reveal that distribution is determined by technological relations alone. In other words, the values of *r* and *w* can be calculated when the production possibilities as a whole, *f*, and the particular endowment of resource in use yielding *k*, are known. Then $r = f'(k)$. It implies that the marginal product of capital is equal to the rate of interest, as shown in Fig. 3. Similarly, the wage rate can be deduced as the marginal product of labour (MP_L) which yields the expression $w = f(k) - k f'(k)$. This is how technology alone determines distribution in the classical theory.

THE CAMBRIDGE CRITICISMS

The Cambridge critique of the neo-classical capital theory revolves around two main criticisms. *First*, it uses explicit aggregate production function. *Second*, it measures aggregate capital either in physical units or at current market value.* The debate originated with Joan Robinson's criticism in her famous article of 1953 and Samuelson[2] was its chief rebutter while Hicks[3], Solow[4], Champernowne[5], and many economists participated in it. We discuss the main points of criticism.

JOAN ROBINSON'S CRITIQUE

Joan Robinson's critique of the neo-classical theory of capital is based on its assumptions:

1. She rejects altogether the parable of homogeneous, malleable, divisible and substitutable capital for labour. In the nature of capital, Robinson includes, "so many particular objects called blast furnaces, overcoats etc. Goods grouped under the same name differ from each other in details of their

physical specification and these must not be overlooked. Differences in their ages are also important." Thus, according to Robinson, capital is made of heterogeneous equipments of different vintages having different values.

2. But there is the problem of aggregating heterogeneous capital goods into a scalar value of capital. According to Solow, in general it is impossible to form aggregate capital. To solow, an aggregate capital stock is a simple measure of the total quantity of capital used in the production process. For the case of two inputs, capital and labour, an aggregate production function is a function which focuses on the total output generated from all units of the two inputs and expresses it in terms of aggregative capital stocks and a separate measure of the total labour quantity employed.

3. In the neo-classical theory, output *(Q)* is regarded as a function *(F)* of the amounts of capital *(K)* and labour (L) *i.e., Q = F(K, L).* Joan Robinson asks the basic question, by what units *K* is to be measured? According to her, the capital stock should be measured in units of labour and should be equated to the labour inputs which it costs, compounded at the ruling rate of interest. As against the neo-classical view that the capital stock cannot be measured without knowing the rate of interest, she suggested that the production function itself works only if the capital stock is measured by its value in wage units. Whatever be the defects of the neo-classical production function, what Champernowne called "J.K. Units", can produce only mental and diagrammatic contortions.

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* Students should also read the 'Capital Controversy' given in the beginning of this chapter.

2. P. A. Samuelson, "Parable and Realism in Capital Theory : The Surrogate Production Function, " *R.E.S.*, 1962 and "A Summing Up," *Q.J.E.*, 1966.

3. J.R. Hicks, *Capital and Growth*, 1965.

4. R.M Solow, "The Production Function and the Theory of Capital," *R.E.S.*, 1955.

5. D.G. Champernowne, "The Production Function and the Theory of Capital: A Comment, *R.E.S.*, 1953.

4. Joan Robinson objects to the neo-classical theory that its distribution aspects depend upon marginal products. According to her, the aggregate production function cannot be used to determine the rate of profit (or interest) as the marginal product of capital. The neo-classicals equated the marginal product of capital to the rate of profit. The rate of profit is equal to the ratio of

surplus from output sold to finance investment in a project. It is calculated as the marginal increment of output to a marginal increment of capital. Thus the neo-classical aggregate production function relates variations in output per man to variation in capital per man. Joan Robinson does not agree with this on the ground that marginal product of capital is a physical concept while the rate of profit is the outcome of the ratio of two monetary values (i.e., surplus of goods sold and advance of capital). In other words, the value of the surplus is calculated relative to the value of the advance at current prices. Therefore, to calculate the rate of profit, there is need to know prices, and to know prices, we need to know the rate of profit. Thus the derivation of the rate of profit as the marginal product of capital from a ratio of surplus to advance is a circular reasoning. Thus, according to Joan Robinson, there is no meaning to be given to a 'quantity of capital' apart from the rate of profit, so that the contention that the marginal product of capital determines the rate of profit becomes meaningless.

5. In the neo-classical production function, capital and labour are taken as substitutes and in fixed proportions. But if they are heterogeneous with no scope for substitution, the inter-relationships between *r, w, q* and *k* may not hold. Joan Robinson points out that in such a situation over certain ranges of the "pseudo-production function" (as described by Solow), the techniques that becomes eligible at a higher rate of profit (or interest) with a corresponding lower wage rate may be less labour-intensive or may have a higher output per worker *(q)* than chosen at a higher wage rate. This is contrary to the rule of a "well-behaved production" function (neo-classical) in which a lower wage rate is always associated with a more labour-intensive technique or lower output per worker. Joan Robinson calls this "Ruth Cohen Curiosum" or what is now called the "reswitching of techniques.".

SAMUELSON'S CRITIQUE AND THE SURROGATE PRODUCTION FUNCTION

Samuelson in his article on "Parables and Realism in Capital Theory" defends the neo-classical capital theory by taking 'a great variety of heterogeneous physical capital goods and processes through time.' For this, he developed the "Surrogate Production Function" as "some rationalisation for the validity of the simple J.B. Clark parables which pretend that there is a single thing called

'Capital' that can be put into a single production function and alongwith labour will produce total output." Thus in his Surrogate Production Function model, Samuelson shows that proposition of the neo-classical capital theory are valid when there are fixed proportions and heterogeneous capital goods.

ASSUMPTIONS

He makes the following assumptions :

1. There is a two-sector economy in which both a consumer good *(C)* and a capital good *(K)* are produced.

2. It produces only one kind of homogenous final output.

3. Both the goods are produced by means of non-productible labour and single produced capital in rigidly fixed proportions.

4. There are fixed proportion techniques to produce a common consumption good and a particular capital good.

5. The production functions for the consumption and capital goods are the same.

6. There are separate production functions corresponding to each activity having no smooth substitutability.

7. Technical knowledge does not change.

8. There are constant returns to scale.

9. There is a perfectly competitive market.

SURROGATE PRODUCTION FUNCTION

Given these assumptions, Samuelson's surrogate production relations for a typical process can be expressed as

$$K = C = \min\left(\frac{1}{\alpha_K}K, \frac{1}{\alpha_L}L\right) \qquad \ldots(1)$$

where, *K* denotes the capital good; *C* the consumption good and αs are the technological coefficients. Since factor proportions are the same in both sectors, α_K and α_L, are identical.

In this system, there is a great variety of stationary states in which the wage rate *(w)* and the interest rate *(r)* are determined. The equilibrium relation between *w* and *r* is represented by what Samuelson calls the Factor-Price Frontier.

Equation 1 implies the following relation between *w* and *r,*

$$w = \frac{1}{\alpha_L} - \frac{\alpha_K}{\alpha_L} \qquad \text{...(2)}$$

and

$$-\frac{dw}{dr} = \frac{\alpha_K}{\alpha_L} = \frac{K}{L} \qquad \text{....(3)}$$

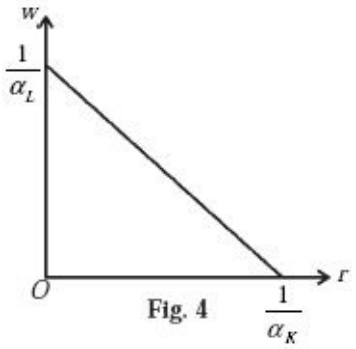

Fig. 4

Equation 3 shows that the slope of a straight line factor-price frontier is equal to the common capital-labour ratio *(K/L)* of this technique. This is illustrated in Fig. 4 where the factor-price frontier $1/\alpha_L$ and $1/\alpha_K$ is negatively sloped and is a straight line. It shows that when the rate of profit, *r* is zero then the wage rate equals $1/\alpha_L$ and when the wage rate is zero, the rate of profit is $1/\alpha_K$. The slope of each factor-price frontier is associated with a particular technique and represents the neo-classical relation that the capital-labour ratio *(k)* varies directly with the wage-interest rate ratio *(w/r).*

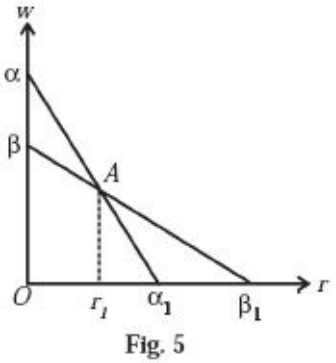

Fig. 5

Let us take the consequences of having two different techniques having different straight line factor-price frontiers. Fig. 5 shows two techniques α and β . Their linear factor-price frontiers intersect at point *A.* For rates of profit less than r_1 , competition will ensure that only α technique is used because in this range, (0 to r_1)*α* technique provides a higher rate of profit for any given wage rate than β technique. At rates of profit greater than r_1, β technique is more profitable while at r_1 the two techniques are equally profitable. As the slope of each factor-price frontier equals the common

capital-labour ratio *(K/L or k)* associated with each technique, high rates of profit and low wage rates are associated with low levels of *K/L* ratio and vice versa. This again proves the neoclassical parable that the capital-labour ratio *(k)* varies directly with the wage-interest rate ratio *(w/r)* without reswitching of techniques.

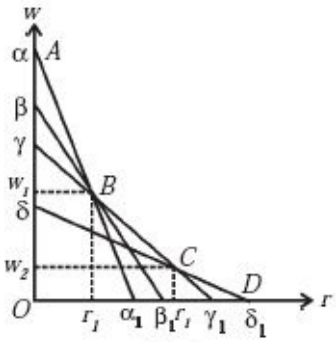

Fig. 6

Now take four different techniques so that each technique has a different straight line factor-price frontier. They are shown as $\alpha\alpha_1$, $\beta\beta_1$, $\gamma\gamma_1$ and $\delta\delta_1$ in Fig. 6 which intersect at a single "switch point" such as *A, B, C* and *D.* The envelope of these lines as the dark curve is called the *Grand Factor-Price Frontier.* According to Samuelson, "equilibrium is possible only on the north-east frontier or "envelope" of all the straight lines." This grand frontier consists of straight line segments and corner points. On any straight line segment, only the technique corresponding to that line is being used, such as technique α on the segment *AB* and δ on *CD.* The slope of the straight line is a simple index of capital per worker and the elasticity of the envelope on each point is a measure of the relative shares of labour and capital in distribution. At any corner point, there is a blending of two adjacent techniques where relative shares characterise each technique separately. At the corner point B, techniques α, β and γ give the same rate of profit r_1 at the wage rate w_1 . In case the wage rate is above w_1 the α technique is the optimum because the rate of profit for it is greater than the other two techniques. (Imagine lines drawn on the horizontal axis from the segments α*B,* β*B* and γ*B).* Similarly, the corner point *C* where the techniques γ and δ give the same rate of profit r_2 and the wage rate w_2. But below w_2, the technique δ is preferred because it gives higher rate of profit *(r)* than the technique γ . Thus Samuelson's parables of fixed proportions techniques and homogeneous capital validate the neo-classical theory in relation to the theory of distribution.

Next Samuelson shows that his surrogate (homogeneous) capital model gives exactly the same results as the heterogeneous capital model explained above. The quantity of surrogate capital *(* jelly *)* can be computed at each stationary equilibrium situation "by calculating the slope of the Factor-Price Frontier at

each and every point and multiplying it by the easily measurable labour at that point," i.e. the slope of the frontier, $dw/dr = -K/L$, having the properties of a one good model. It implies that as w decreases, r increases. Further, the wage-interest rate ratio at any point on the factor-price frontier is equal to the elasticity of the frontier at that point, i.e. elasticity = $-wdr_1 / rdw = wL/rK$ = ratio of relative prices.

For his surrogate capital model, Samuelson assumes labour and a homogeneous capital jelly which produce a homogeneous output. The production function obeys constant returns to scale and smooth substitutability and well behaved marginal productivities of labour and capital.

Given these assumptions, Fig. 7(A) shows different wage and profit rates that will prevail at each level of capital-labour ratio *(k)* in accordance with the law of diminishing returns. To get the factor-price frontier, we simply plot the size of the upper curve (a) against that of the lower curve (b) in Panel (B). This is the *Surrogate Production Frontier* which shows the inverse monotonic relation between w and r. This curve resembles the factor-price frontier of the heterogeneous capital model, as shown in Fig. 6.

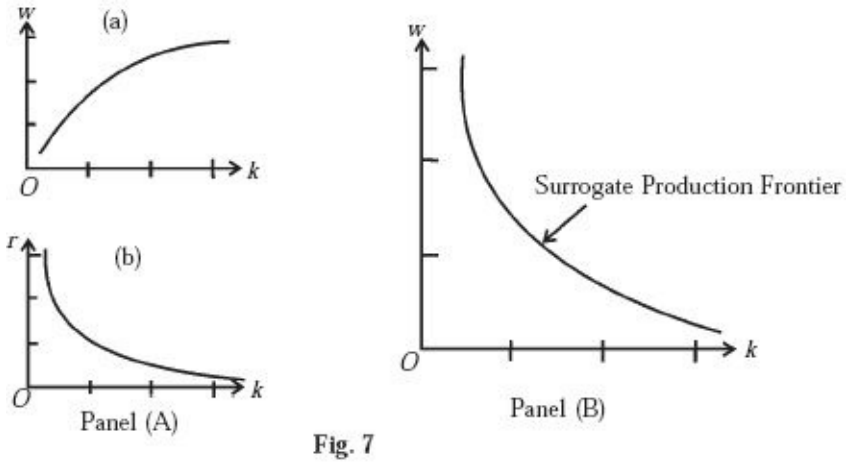

Fig. 7

Thus Samuelson's surrogate (homogeneous) capital model gives exactly the same results as his surrogate (heterogeneous) capital model and validates the classical theory of capital.

ITS CRITICISMS

Several Cambridge economists on both sides have criticised Samuelson's Surrogate Production Function on the following grounds :

1. According to Joan Robinson, Samuelson's parables of heterogeneous capital and fixed proportions in his surrogate production function model do not validate the neo-classical theory. It simply shows that it is valid in certain situations taken by Samuelson.

2. In investigating the meaning of pseudo-production function, Robinson found that there is no meaning to be given to a 'quantity of capital' apart from the rate of profit, so that the contention that the 'marginal product of capital determines the rate of profit, is meaningless. Incidentally she found that over certain ranges of the pseudo-production function, the technique that becomes eligible at a higher rate of profit with a correspondingly lower wage rate may have a higher output per man (q) (less labour-intensive) than that chosen at a higher wage rate, contrary to the rule of a well-behaved production function in which a lower wage rate is always associated with a more labour-intensive technique (less output per man). Robinson attributed this discovery to *Ruth Cohen Curiosum.*

3. According to Piero Garegnani, Samuelson's Surrogate Production Function is a special case of a pseudo-production function with labour-value prices. In this context, Robinson pointed out that Samuelson had ignored Garegnani's warning and treated labour value prices as the general case. His real mistake was to suppose that a pseudo-production function which relates the rate of profit to the value of capital at the prices corresponding to that rate of profit provides the neo-classical parable. In fact, the neo-classical 'capital' is a physical quantity which is independent of prices.

4. Joan Robinson, Sraffa, Hicks, Garegnani, and Samuelson himself in a footnote to his article of 1962 pointed out that when there is reswitching of techniques, many of the theorems of the neo-classical theory are invalidated. We know that in the neo-classical capital theory, high capital-labour ratios are associated with high wage rates and relatively low profit rates. If at some rate of profit, a technique which was previously used at a higher rate of profit is discontinued in favour of another more profitable

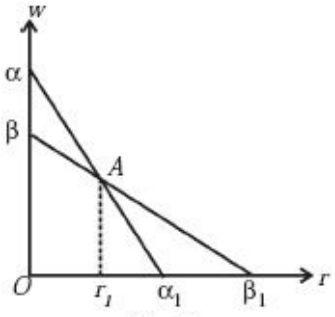

Fig. 8

technique, then Samuelson's analysis implies that *there cannot exist any lower rate of profit at which the first technique is re-employed.* This is illustrated in Fig. 8 where two linear factor-price frontiers associated with α technique and β technique intersect at point *A.* We have studied in Fig. 5 that at rates of profit less than r_1 , technique α provides a higher rate of profit then β technique, and at rates of profit greater than r_1, β technique gives more profit than α technique. So technique β which would have been used at *any* rate of profit *above* r_1 is *always* less profitable than a technique for *every* level of the rate of profit *below* r_1. Thus the main weakness of Samuelson's fixed proportions and heterogeneous capital model is that it is not possible to establish a definite relation of the neo-classical theory between capital-labour ratio and factor-price ratio.

5. More serious problems arise when both the factor-price frontiers are not straight lines and reswitching occurs. If in the two sector model, more of given capital relative to labour is needed to produce a capital good than to produce a consumption good, the factor-price frontier between the wage rate and interest rate would be *convex* to the origin, because a rise in interest rate would affect the capital goods sector more than the consumption goods sector.

Similarly, if the proportion between capital goods and labour is higher in the consumption goods sector than in the capital goods sector, the factor-price frontier would be *concave* to the origin. Robinson and other economists of the British Cambridge School point out that with several wage rates and profit rates at several switch points on factor-price frontiers, producing two goods is equally profitable. As a result, changes in the relative values of goods can occur which go against the neo-classical theory.

Consider Fig. 9 which shows factor-price frontiers of two different techniques α and β . The factor=price frontier of β technique is a straight line which'satisfies the Samuelson assumption of equal capital-labour ratios *(K/L)* in each sector. The α technique is drawn as a convex curve. The shape of α α_1 curve implies that with α technique, production in the capital goods sector is labour-intensive relative

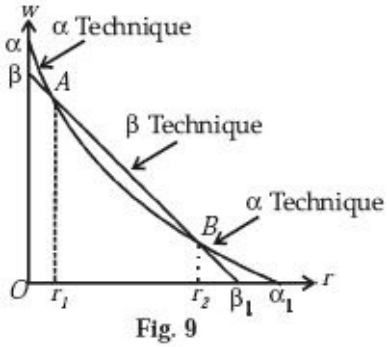

Fig. 9

to production in the consumption goods sector. Here the two curves cross twice so that there are two switch points A and B. This is the *reswitching* or *double switching* of techniques. The α technique will be employed above the switch point *A* because it is more profitable than β technique. Below r_1 the rate of profit is relatively lower than the wage rate. Between *A* and *B* switch points with rates of profit r_1 and r_2, β technique is used because this technique is more profitable than α technique. But below the switch point β once again α technique will be used because above r_2 the rates of profit are relatively higher than the wage rate. The existence of reswitching is paradoxical in this case because the same technique α, is the more profitable of the two techniques at both very low and very high levels of the rate of profit, while the other technique β is the most profitable at intermediate levels. Thus the presence of reswitching invalidates the neo-classical theory.

The same type of analysis applies in Fig. 10 where the factor-price frontier of α technique is concave and that of β technique is linear. Here β technique is more profitable than the α technique at switch points *A* and *B* below r_1 and above r_2 rates of profit.

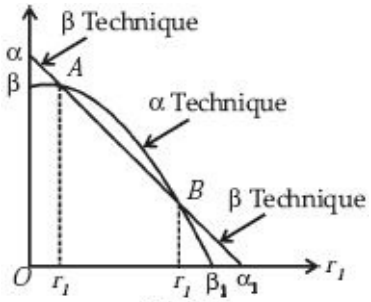

Fig. 10

MORE ABOUT THE CAMBRIDGE CRITIQUE

1. We can infer from the capital controversy between the two Cambridges that each depends upon an exogenously given set of technical relations which incorporate the conditions of production. From these, the necessary logical relations are formed between wages and profits. So the Cambridge critique of the neo-classical one-sector production function is simply a criticism of a one sector model and all other things remain unchanged on the production side. In reality, the Cambridge critique is not a criticism but a reformulation of the neoclassical production theory by generalising it from the one sector model to a two sector model. Thus the critique is not a radical break with the neo-classical theory.

2. For these reasons, the critique does not provide any solutions to the problems raised by it. It does not explain the existence of wages and profits. It

simply presumes the existence of wages and profits. So it only explains the existence of profits on the basis that wages do not absorb the whole net product.

3. Similarly, it fails to explain the weaknesses of the neo-classical theory of distribution.

4. Like the neo-classicals, the critique explains different steady state equilibrium paths in terms of comparative static analysis rather than in dynamic equilibrium.

5. The critique depends upon the existence of reswitching of techniques and its validity, in turn, depends upon the existence of reswitching in the real world. This is an empirical-question which can be provided on the basis of data. As the data do not exist in the real world, nobody has investigated the existence of reswitching. Thus reswitching is simply a theoretical concept which exposes its limitation. However, writers like Levhari have produced *sufficiency theorems* which demonstrate under what situations reswitching can and cannot occur. The neo-classical economists admit that the possibility of reswitching weakens the theory in terms of parables but they do not accept that it makes any serious difference to the neo-classic theory in general. Stiglitz has shown that in truly dynamic economies, the problem associated with heterogeneous capital goods are not those of reswitching or the recurrence of techniques. Rather they relate to the possible non-uniqueness of momentary equilibrium in the presence of heterogeneous capital goods.

CONCLUSION

The capital controversy does not exist now because the Cambridge critics believe that their viewpoint has triumphed while the neo-classicals contend that the critique was never about the real issues involved in the controversy. Thus it is difficult to draw any correct conclusion about the capital controversy as to who won and who lost.

Despite this, the capital controversy has definitely highlighted many difficulties associated with the heterogeneous capital goods and the problem of deriving correct predictions of the relationship between, capital-labour ratio and wage-interest rate ratio.

CHAPTER

The Fel'dam Model

THE MODEL

G.A. Fel'dman was a Russian economist who wrote an article '*On the Theory of National Income Growth*' which was published in *The Planned Economy,* the journal of the Soviet State Planning Commission (GOSPLAN) in 1928. It is a theoretical model which is concerned with long-run planning.[1]

Assumptions

The Fel'dman model is built around the following assumptions :

1. It assumes constant prices in the economy.

2. Capital is assumed to be the only limiting factor.

3. There are no lags in the growth process.

4. There is a closed economy.

5. There are two sectors in the economy—the consumer goods sector and the capital goods sector.

6. Production is assumed to be independent of consumption,

7. There is no government expenditure except on consumption and investment.

8. There are no bottlenecks in the economy.

9. The supply of labour is unlimited.

1. The Fel'dman Model has been translated and interpreted in English by Evcsy D Domar. *Essays in the Theory of Economic Growth (*1957). Essay IX. Our analysis is based io Prof. Domar's interpretation.

Given these assumptions, Fel'dman based his model on the Marxian division of the total output of an economy (*W*) into category 1 and category 2. The former relates to capital goods meant for both producer goods and consumer goods, while the latter category relates to all consumer goods including raw materials for them. The production of each category is expressed as the sum of constant capital *(C)*, variable capital (wages), *V,* and surplus value *S.* It can be shown as

$$W_1 = C_1 + V_1 + S_1$$
$$+W_2 = C_2 + V_2 + S_2$$
$$W = C + V + S$$

"The division of the economy between the two categories is complete, in the sense that no existing capital can be transferred from one to another. Thus the rate of investment is rigidly determined by the capital coefficient and the stock of capital in category 1. Similarly, the output of consumer goods is determined by the stock of capital and the capital coefficient of category 2. Hence the division of total output between consumption and investment at any given moment depends on the relative productive capacities of the two categories. The division of total investment (that is, of output of category 1) between the two categories is, however, completely flexible. Indeed the fraction of total investment allocated to category 1 is the key variable to the model."

In this two-sector model he demonstrated that if

γ = the fraction of total investment allocated to category 1;

I = the annual rate of net investment allocated to the respective categories, so that $I=I_1 + I_2$;

t = the time measured in years;

V - the marginal capital coefficient for the whole economy;

V_1 and V_2 = the marginal capital coefficients of the respective categories;

C = the annual rate of output of consumer goods;

Y = the annual net rate of output of the whole economy or national income;

α = the average propensity to save;

α'= the marginal propensity to save;

I_0 , C_0 and Y_0=the respective initial magnitudes of these variables (when t = 0); the annual rate of net investment allocated to category 1 is given by $I_1 = \gamma I$. And since only I_1 increases the capacity of category 1, it is shown by

$$\frac{dI}{dt} = \frac{I_t}{V_1} = \frac{\gamma I}{V_1} \qquad [\because I_1 = \gamma I]$$

In time t, total investment will grow at an exponential rate

$$I = e^{\gamma/v_t} \qquad \ldots (1)$$

In other words, total investment will grow at a constant exponential rate of γ/ V_1-

Similarly, the annual rate of net investment allocated to category 2 is given by $I_2 = (1—\gamma)I$. And I_2 being the source of increased capacity in category 2,

$$\frac{dC}{dt} = \frac{I_2}{V_2} = \frac{(1-\gamma)}{V_2} e^{\gamma/v_1 t} \qquad [\because I = e^{\gamma/v_1 t}]$$

The annual rate of output of consumer goods is given by

$$C = C_0 + \left(\frac{1-\gamma}{\gamma}\right)\frac{V_1}{V_2}(e^{\gamma/v_1 t} - 1) \qquad \ldots(2)$$

The elements which determine the national income and the growth rate of the economy are given by

$$Y = I + C$$

By substituting the values of I and C in the above equation

$$Y = e^{\gamma/v_1 t} + C_0 + \left(\frac{1-\gamma}{\gamma}\right)\frac{V_1}{V_2}(e^{\gamma/v_1 t} - 1) \quad \text{[From (1) and (2)]}$$

$$Y = e^{\gamma/v_1 t} - 1 + 1 + C_0 + \left(\frac{1-\gamma}{\gamma}\right)\frac{V_1}{V_2}(e^{\gamma/v_1 t} - 1)$$

$$= (e^{\gamma/v_1 t} - 1) + 1 + C_0 + \left(\frac{1-\gamma}{\gamma}\right)\frac{V_1}{V_2}(e^{\gamma/v_1 t} - 1)$$

$$= [1 + C_0 + \left(\frac{1-\gamma}{\gamma}\right)\frac{V_1}{V_2} + 1](e^{\gamma/v_1 t} - 1)$$

Assuming $I_0 = 1$, the equation becomes

$$Y = I_0 + C_0 + \left[\left(\frac{1-\gamma}{\gamma}\right)\frac{V_1}{V_2} + 1\right](e^{\gamma/v_1 t} - 1)$$

or

$$Y = Y_0 + \left[\left(\frac{1-\gamma}{\gamma}\right)\frac{V_1}{V_2} + 1\right](e^{\gamma/v_1 t} - 1) \qquad [\because Y_0 = I_0 + C_0]$$

The fundamental equation shows that *C* and *Y* each represent a sum of a constant and an exponential in *t*. Their rates of growth will differ from γ/V_1. The values of *C* and *Y* will.be greater than the value of *I*. With the passage of time, the exponential $e^{\gamma/v_1 t}$ will dominate the scene and the rates of growth of *C* and *Y* will gradually approach γ/V_1. But this may take quite a long time, unless of course it so happens that $C_0 = \frac{(1-\gamma)}{\gamma}\frac{V_1}{V_2}$ in which case the constants will vanish, and *C* and *Y* will grow at the rate of γ/V_1 from the very beginning."

COMPARISON WITH THE DOMAR MODEL

In the Domar model, the average propensity to save (α) is equal to the marginal propensity to save (α'), *i.e.*, α = α'. But in the Fel'dman model α = α'. To compare the Domar model with the Fel'dman model, it is necessary to rework their results without the assumption that α ≠ α', treating α' as a constant. But since α = α', α has now become a variable. The rate of growth of investment will now be α'/v while that of income α /v (by disregarding the difference between α and *s* : *s* being the reciprocal of *v*). The expression α'/v is the ratio of marginal propensity to save to the overall capital coefficient. In Fel'dman's model, however, we have obtained γ/V_1 as the growth rate of

investment where γ is the fraction of investment allocated to category 1 and V_1 is the capital coefficient of this category only. In the special case when $V=V_1$, we obtain α = γ, that is Fel'dman's fraction of investment allocated to category 1 and the marginal propensity to save become, identical. If $V_1 > V_2$, than γ>α'. When $V_1 = V_2$, Fel'dman's γ and Domar's α' are closely related. "But it is merely a reflection of the fact that if a certain fraction of increment in national income (α') is to be devoted to investment, a corresponding fraction of investment (γ) must be allocated to capital goods industries to make the production of this increment in investment possible. In other words, in a growing economy some capital is used to make more capital."

IMPLICATIONS FOR ECONOMIC DEVELOPMENT

The Fel'dman model has important implications for economic development. Since $V_1 = V_2$, the expressions *I*, *C* and γ in the model are all inverse functions of V_1 and V_2. Fel'dman treated the magnitudes of his capital coefficients as variables for the purpose of economic development. If the purpose of economic development is maximisation of investment or national income at a point of time, or of their respective rates of growth, or of integrals overtime, γ should be set as high as possible. This is always true for investment and nearly always for income. The only exception being when V_1 greatly exceeds V_2 and even then for a short period of time. A high γ does not imply, however, any reduction in consumption. With capital assets assumed to be permanent, even γ = 1 would merely freeze consumption as its original level. If assets were subject to wear, consumption would be slowly reduced by failure to replace them. Finally, a transfer of resources from consumption to investment industries would reduce consumption still further, though the latter possibility is excluded from the Fel'dman model.

Summing up the Fel'dman model, Prof. Domar observes: "it contains an important element of truth, a closed economy without well-developed metal, machinery and subsidiary industries (the complex of the so-called heavy industries) is unable to produce a sizable quantity of capital goods and thus to invest a high fraction of its income, however, high its *potential* saving propensity may be. In Soviet economic thinking the former consideration has been predominant; in our recent literature the ability to save has been

emphasized." This was because he felt that more could be achieved with greater utilization of capital than from its expansion as happened in Russia from 1924-25 through 1927-28. He, therefore, favoured a fall in the magnitudes of his capital coefficients.

But his own analysis of data given in the optimal version of the First Five-Year Plan of Russia indicated movement and variation in coefficients of specific industries, while the average for the whole economy remained almost unchanged at 2.4 for every year for the period 1925-26 to 1932-33. However, in the 'two versions of his own long-run plan, he showed in the first an almost constant capital coefficient at 2.4 for the period 1926 to 1932 which gradually rose to 3.3 in 1950; and in the second, a sharply declining coefficient to about 2.0 in 1930 which stabilised at 1.4 over the period 1932-50. The purpose of working out such contrasting versions was to illustrate the effect of the variation in the size of the capital coefficient on the growth rate of national income.

Treating the capital coefficient as given, the variable y (the fraction of total investment allocated to category 1) can be varied as an instrument of planning. Since there is complete intra-category flexibility γ can vary between zero and one. But the choice of the optimum size of *r* will depend on the objective of economic development.

But the Fel'dman model does not determine the magnitude of capital coefficient because no attempt is made to relate it to any other variables, such as the desirability of the assets, the length of the construction period, the supply of labour and of other factors like the magnitude, composition and the rate of growth of investment and the industrial structure.

Moreover, it is difficult to distinguish clearly between consumer goods and capital industries, when a large number of industries are in the nature of intermediate goods industries which help produce both consumer goods and capital goods. For instance, metals, coal, transportation, chemicals, petroleum, power, etc. are some of the industries whose goods and services are used in both categories of Fel'dman. "Perhaps Fel'dman could claim that in the Russia of his day, practically all metals were used in category 1 only. But what would he say about the rest? Nor would it help to divide an industry (like coal or transportation) between two categories, because the respective proportions

would by their very nature lack stability. Of course, any division of an economy by industries, or even of output between consumption and investment, is difficult and arbitrary but it is clear that Fel'dman's method creates special difficulties."

CHAPTER

The Mahalanobis Model

INTRODUCTION

In October 1952, Mahalanobis developed a single-sector model based on the variables of national income and investment. It was further developed into a two sector model in 1953 where the entire net output of the economy was supposed to be produced in only two sectors—the investment goods sector and the consumer goods sector. Next he developed the famous *four-sector model* in 1955. We will discuss his two-sector and four-sector models.

TWO-SECTOR MODEL

It was Mahalanobis's two-sector[1] model which became the basis for his formulation of the four-sector model for the Second Five-Year Plan. The *Mahalanobis two-sector* model was based on the following assumptions:

(a) It is related to a closed economy where there is no foreign trade.

(b) The economy consists of two sectors: the consumer goods sector and the capital goods sector. There is no intermediate sector. The industries producing intermediate goods are grouped together with the consumer goods and the capital goods which they help to produce.

1. P.C. Mahalanobis, "Some Observations on the Process of Growth of National Income." *Sankhya*, September 1953. This model turned out to be almost identical with the Fel'dman model.

(c) There is total non-shiftability of capital equipment once installed in any of the sectors. But products of the capital goods sector can be used as inputs in the two sectors.

(d) There is full capacity production in the consumer goods sector as well as

in the capital goods sector.

(e) Investment is determined by the supply of capital goods.

(f) There are no changes in prices.

Given these assumptions, Mahalanobis divides the economy into two parts: λ_k , the proportion of net investment used in the capital goods sector and λ_C, the proportion of net investment used in the consumer goods sector:

$$\lambda_k + \lambda_C = 1 \qquad \ldots(1)$$

Further, net investment (I) can be divided into two parts at any point of time (t): one, $\lambda_k I_t$ to increase the productive capacity of the capital goods sector and λ_C I_C of the consumer goods sector. In this way

$$I_t = \lambda_k I_t + \lambda_C I_t \qquad \ldots(2)$$

Taking β_k and β_C as the output-capital ratios of the capital goods sector and the consumer goods sector respectively and β as the total productivity coefficient, the latter can be shown as

$$\beta = \frac{\beta_k \lambda_k + \beta_c \lambda_c}{\lambda_k + \lambda_c}$$

But $\lambda_K + \lambda_C = 1$

$$\beta = \beta_k \lambda_k + \beta_C \lambda_C \qquad \ldots(3)$$

The income identity equation for the entire economy is

$$Y_t = I_t + C_t \qquad \ldots(4)$$

Now, when national income changes, investment and consumption also change. The change in investment depends upon previous year's investment (I_{t-1}) and so does consumption on previous years consumption (C_{t-1}). So the increase in investment in period t, is $\Delta I_t = I_t - I_{t-1}$, and increase in consumption is $\Delta C_t = C_t - C_{t-1}$. As a matter of fact, the increase in the two sectors is related to the linking up of productive capacity of investment and the output-capital ratio. *First*, the *investment growth path* is determined by the productive capacity of

investment in the capital goods sector ($\lambda_k I_k$) and its output-capital ratio (β_k). So that

$$I_t - I_{t-1} = \lambda_k \beta_k I_{t-1}$$

$$I_t = I_{t-1} + \lambda_k \beta_k I_{t-1}$$

or $$I_t = (1+ \lambda_k \beta_k) I_{t-1} \quad \ldots(5)$$

Putting different value for t (t = 1, 2, 3,....) the solutions of equation (5) are

$$I_1 = (1 + \lambda_k \beta_k) I_0$$

$$I_2 = (1 + \lambda_k \beta_k) I_1$$

$$= (1 + \lambda_k \beta_k) (1 + \lambda_k \lambda_k) I_0$$

$$= (1 + \lambda k\ \beta k)^2 I_0 \qquad [\because I_1 = (1+\lambda k\ \beta k)\ I_0]$$

In the same manner by putting the value of t in equation (5), we get

$$I_t = I_0 (1 + \lambda_k \beta_k)^t$$

$$I_t = I_0 = I_0 (1 + \lambda_k \beta_k)^t - I_0$$

$$I_t = I_0 = I_0(1 + \lambda_k \beta_k)^t - 1 \quad \ldots(6)$$

Similarly, by putting the value of t (t = l, 2,3,. . .) in the *consumption growth path* $\Delta C_t = C_t — C_{t-1} = \lambda_c \beta_c I_{t-1}$, we get

$$C_1 - C_0 = \lambda_C \beta_C I_0$$

$$C_2 - C_1 = \lambda_C \beta_C I_1$$

and, finally $$C_t - C_0 = \lambda_C \beta_C \ (I_0+I_1+I_2+....+I_t)$$

By substituting the values of I_1, I_2...I_t in equation (6) and its related equations, the above equation can be solved as

$$C_t - C_0 = \lambda_C \beta_C [I_0 + (1 + \lambda_k \beta_k) I_0 + (1+ \lambda_k \beta_k)^2 \ I_0 +...+ (1+\lambda_k \beta_k)^t \ I_0]$$

$$= \lambda_C \beta_C I_0[1 + (1 + \lambda_k \beta_k) + (1+ \lambda_k \beta_k)^2 \ +...+ (1+\lambda_k \beta_k)^t \ ]^*$$

$$= \lambda_c \beta_c I_0 \left[\frac{(1+\lambda_k \beta_k)^t - 1}{(1+\lambda_k \beta_k) - 1} \right]$$

or $$C_t - C_0 = \lambda_c \beta_c I_0 \left[\frac{(1+\lambda_k \beta_k)^t - 1}{\lambda_k \beta_k} \right] \quad \ldots(7)$$

Now, the growth path of income for the whole economy on the basis of equation (4) is

$$\Delta Y_t = \Delta I_t + \Delta C_t$$

or $$Y_t - Y_0 = (I_t - I_0) + (C_t - C_0)$$

By substituting the values of equations (6) and (7) in the above equation, we get

$$Y_t - Y_0 = (I_0[1+\lambda_k\beta_k)^t - 1] + \lambda_c\beta_c I_0\left[\frac{(1+\lambda_k\beta_k)^t - 1}{\lambda_k\beta_k}\right]$$

$$= I_0[1+\lambda_k\beta_k)^t - 1]\left[1+\frac{\lambda_c\beta_c}{\lambda_k\beta_k}\right]$$

$$= I_0[1+\lambda_k\beta_k)^t - 1]\left[\frac{\lambda_k\beta_k+\lambda_c\beta_c}{\lambda_k\beta_k}\right]$$

Supposing $I_0 = \alpha_0 Y_0$ and substituting it in the above equation, we have

$$= Y_t - Y_0 = \alpha_0 Y_0[1+\lambda_k\beta_k)^t - 1]\left[\frac{\lambda_k\beta_k+\lambda_c\beta_c}{\lambda_k\beta_k}\right]$$

or $$Y_t = \alpha_0 Y_0[1+\lambda_k\beta_k)^t - 1]\left[\frac{\lambda_k\beta_k+\lambda_c\beta_c}{\lambda_k\beta_k}\right] + Y_0$$

or $$Y_t = Y_0 \left[[1+\alpha_0 \frac{\lambda_k\beta_k+\lambda_c\beta_c}{\lambda_k\beta_k} \{(1+\lambda_k\beta_k)^t - 1\}\right] \quad \ldots(8)$$

where, Y_t = gross domestic national income in year *t*;

α_0 = the rate of investment in the base year;

λ_k = the share of net investment used in the capital goods sector;

$\lambda_c = 1—\lambda_k$ = the share of net investment going to the consumer goods sector;

β_k = incremental output-capital ratio in the capital goods sector;

β_c = incremental output-capital ratio in the consumer goods sector.

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* These are G.P. series, when they are solved, the result is the next equation. Its solution is not required.

The interpretative value of this model is that total investment in the economy consists of two parts: one part λ_k is used to increase the production of capital

goods, and the other part λ_C to increase the production of consumer goods. Thus, the total investment is $\lambda_k + \lambda_C = 1$. The ratio

$$\frac{\lambda_k\beta_k + \lambda_c\beta_c}{\lambda_k\beta_k}$$

of the equation is the overall capital coefficient. Assuming β_k and β_C to be given, the growth rate of income will depend upon α_0 and λ_k. Further assuming α_0 (the rate of investment in the base year) to be constant, the growth rate of income depends upon the policy instrument λ_k.

Given that $\beta_C > \beta_k$, it implies that the larger the percentage investment in consumer goods industries, the larger will be the income generated. The expression $(1+\lambda_A\ \lambda_k)^t$ of the equation shows, however, that after a critical range of time, the larger the investment in capital goods industries, the larger will be the income generated. In the beginning, a high value of λ_k increases the magnitude $(1 + \lambda\beta_k)_t$, and lowers the over-all capital coefficient

$$\frac{\lambda_k\beta_k + \lambda_c\beta_c}{\lambda_k\beta_k}$$

But as time passes, a higher value of λ_k would lead to higher growth rate of income in the long run.

$$\frac{\lambda_k\beta_k}{\lambda_k\beta_k + \lambda_c\beta_c} = \lambda_k$$

If $\beta_C = \beta_k$, then the reciprocal of the overall capital coefficient = marginal rate of saving. This leads us to an important policy implication of the model that for a higher rate of investment (λ_k), the marginal rate of saving must also be higher. A higher rate of investment on capital goods in the short-run would make available a smaller volume of output for consumption, but in the long-run, it would lead to a higher growth rate of consumption.

RELATION OF THE MAHALANOBIS TWO-SECTOR MODEL WITH THE DOMAR MODEL

Mahalanobis derived his two-sector model from the Domar model. Therefore, both the models have a close relation. *First*, we present the Domar model in terms of the parameters of the Mahalanobis model.

The equilibrium equation for determining investment in the Domar model is

$$I = \alpha Y$$

where, I is investment, α is the saving-income ratio and Y is the national income.

The growth of investment in period t is

$$\Delta I_t = \alpha \Delta Y_t \quad \ldots(1)$$

By taking investment in the initial period $I_0 = \alpha_0 Y_0$ ...(2)

Dividing (1) by (2), $\dfrac{\Delta I_t}{I_0} = \dfrac{\alpha}{\alpha_0} \cdot \dfrac{\Delta Y_t}{Y_0}$

or $\dfrac{\Delta Y_t}{Y_0} = \dfrac{\alpha_0}{\alpha} \cdot \dfrac{\Delta I_t}{I_0}$

or $\dfrac{Y_t - Y_0}{Y_0} = \dfrac{\alpha_0}{\alpha} \cdot \dfrac{I_t - I_t}{I_0}$

$[\because \Delta Y_t = Y_t - Y_0 \text{ and } \Delta I_t = I_t - I_0]$

or $\dfrac{Y_t - Y_0}{Y_0} = \dfrac{\alpha_0}{\alpha}\left[\dfrac{I_t}{I_0} - 1\right]$

or $\dfrac{Y_t - Y_0}{Y_0} = \dfrac{\alpha_0}{\alpha}\left[(1+\alpha\beta)_t - 1\right]$

$\left[\because \dfrac{I_t}{I_0} = (1+\alpha\beta)^t \text{ and } \beta \text{ is output capital ratio}\right]$

or $Y_t - Y_0 = \dfrac{\alpha_0}{\alpha} Y_0 [(1+\alpha\beta)^t - 1]$

or $Y_t = \dfrac{\alpha_0}{\alpha} Y_0 [(1+\alpha\beta)^t - 1] + Y_0$

or $Y_t = Y_0 \left[1 + \dfrac{\alpha_0}{\alpha}\{(1+\alpha\beta)^t - 1\}\right]$ ....(3)

On the other hand, the final equation of the two-sector Mahalanobis model is

$$Y_t = Y_0\left[1 + \alpha_0 \frac{\lambda_k\beta_k + \lambda_c\beta_c}{\lambda_k\beta_k}\left\{(1+\lambda_k\beta_k)^t - 1\right\}\right] \quad \ldots(4)$$

There are certain similarities between the two models. *First*, the last expressions of the two equations (3) and (4) are similar, *i.e.*, $(1 + \beta)^t$ and $(1+\lambda_k\beta_k)^t$, since Domar's $\alpha\beta$ is Mahalanobis's $\lambda_k\lambda_k$. *Second*, both use the concept of time lag. *Finally*, the policy conclusions of both are the same, investment can be increased by raising the marginal savings rate.

Despite these similarities, there is some difference between the two models. The Domar model is a single-sector model, while the Mahalanobis model is a two-sector model. Mahalanobis divides the economy into the capital goods sector and the consumer goods sector. On the other hand, Domar treats the whole economy as one sector.

FOUR-SECTOR MODEL

The Mahalanobis model is not a growth model in the real sense, rather it is an allocation model. Being associated with the Planning Commission, Mahalanobis knew that the maximum funds available for net investment during the *Second Five-Year Plan* would be approximately Rs 5,600 crores and the aim was to provide additional employment to 10-12 million people. To these, he added a 5 per cent per annum increase in national income during the Plan period. He further estimated one-third of the total investment in investment goods industries, leaving two-thirds for investment in the remaining three sectors of the economy. He put all this data in a simple simultaneous equation system given below and obtained the solution which became the basis of India's Second Five-Year Plan. The Mahalanobis model takes a four-sector economy consisting of:

(*a*) the investment goods sector *(k);*

(b) the factory produced consumer goods sector (C_1);

(*c*) the small household produced (including agricultural products) consumer goods sector (C_2); and

(*d*) services (health, education, etc.) producing sector (C_3).

These subscripts k ,1, 2, and 3 are used respectively in the model for the industries producing investment goods, consumer goods (both factory and household), and services.

For each of these four sectors a set of three parameters is introduced

β's (beta), *i.e.*, β_k, β_1, β_2, β_3 —the ratios of net income generated to investment or output-capital ratios.

θ's (theta), *i.e.*, θ_k, θ_1; θ_2, θ_3, — the net investment required per engaged person or capital-labour ratios.

λ's (lambda), i.e. λ_k, λ_1, λ_2, γ_3,— the proportion of investment allocated to each sector or allocation ratios.

Further, *A* stands for the total amount of investment to be made for the plan period of five years, *E* for the total increase in income and *N* for the total increase in employment over the plan period.

Given these parametric ratios (β's, θ's and λ's) and the total amount to be invested *(A)*, an estimate of total income *(E)* and employment *(N)* generated in the different sectors of the economy during the plan-period can be had on the basis of the system of equations.

The equations of the model are:

$$E = E_k + E_1 + E_2 + E_3 \quad \text{....(1)}$$
$$N = n_k + n_1 + n_2 + n_3 \quad \text{....(2)}$$
$$A = \lambda_k A + \lambda_1 A + \lambda_2 A + \lambda_3 A \quad \text{...(3)}$$

Now the increase in employment *(N)* in each sector is

$$n_k = \lambda_k A/\theta_k \text{ or } n_k\theta_k = \lambda_k A \quad \text{....(4)}$$
$$n_1 = \lambda_1 A/\theta_1 \text{ or } n_1\theta_1 = \lambda_1 A \quad \text{....(5)}$$
$$n_2 = \lambda_2 A/\theta_2 \text{ or } n_2\theta_2 = \lambda_2 A \quad \text{....(6)}$$
$$n_3 = \lambda_3 A/\theta_3 \text{ or } n_3\theta_3 = \lambda_3 A \quad \text{....(7)}$$

Substituting the values of $\lambda_k A$, $\lambda_1 A$, $\lambda_2 A$ and $\lambda_3 A$ in equation (3), the total investment equation becomes

$$A = n_k\theta_k + n_1\theta_1 + n_2\lambda_2 + n_3\theta_3 -$$

Similarly, the increase in income *(E)* generated in each sector can be estimated as follows:

$$E_k = \lambda_k A.\beta_k \quad ...(8)$$

$$E_1 = \lambda_1 A.\beta_1 \quad ...(9)$$

$$E_2 = \lambda_2 A.\beta_2 \quad ...(10)$$

$$E_3 = \lambda_3 A.\beta_3 \quad ...(11)$$

Also, $E = n_k\theta_k\beta_k + n_1\theta_1\beta_1 + n_2\theta_2\beta_2 + n_3\theta_3\beta_3$ [$\because \lambda_k A = n_k\theta_k$ and so on from equations 4, 5, 6, and 7]

$$= Y_0[(1+\eta)^5 - 1] \quad ...(12)$$

In the Mahalanobis model the above equation is the final one where, η (eta) is a given 5 per cent annual growth rate of income, and Y_0 the initial income per year, the *E* is derived by applying η rate to Y_0. In the system of equations given above, A, *E* and *N* are the boundary renditions. They are constants. But at the same time they are the target variables to be achieved during the plan-period. The β's, θ's and λ's are the instrument variables.

The β's and θ's are, however, the structural parameters, determined by technological conditions and assumed to remain constant during the plan-period. The λ's are the allocation parameters which are at the choice of the planner within certain limits.

In the Mahalanobis model, the allocation parameter (ratio) λ_k for the investment goods sector is given and the remaining ratios for the other three sectors (λ_1, λ_2, λ_3) are obtained as solutions of the set of simultaneous equations given above. For example, as Mahalanobis explains, "the rate of increase of income or the employment generated may be treated as variables to which desired value may be assigned. The model would then enable us, with the help of numerical estimates of the various parameters, to study how the allocation ratios λ's that is, the proportions of total investment going into the different sectors should be chosen so that the desired aim can be realized."

Prof. Mahalanobis gives the following numerical solution of his model, where

A (total investment) = Rs 5,600 crores

η (percentage increase in national income)

	=5 per cent per annum
N (total employment to be created)	= 110 lakhs (11-million)
λ_k proportion of investment in investment goods industries	$=^1/_3$ (or 0.33)

The sectoral values of λ's, β's and θ's are taken as

Sectors	*Parameters*		
	λ	β	θ
Investment goods *(k)*	λ_k=0.33	β_k=0.20	θ_k = Rs. 20,000
Factory consumer goods (C_1)	λ_1=0.17	β_1=0.35	θ_1 = Rs. 8,750
Small and household industries including agriculture (C_2)	λ_2=0.21	β_2=1.25	θ_2 = Rs. 2,500
Services (C_3)	λ_3=0.29	β_3=0.45	θ_3 = Rs. 3,750

On the basis of the given data, the amount of investment in sector k is $\lambda_k A = \frac{33}{100} \times 5{,}600 = 1{,}850$ crores; the increase in income as a result of this investment comes to $E_k = \lambda_k A \beta_k = 1850 \times \frac{20}{100} =$ Rs 370 crores, while the increase in employment in sector k is of the order of $n_k = \lambda_k A/\theta_k = 1850 \times \frac{1}{20000} = 0.9$ million (9 lakhs). Similarly, the allocation of increase in income, employment generate and investment for the other sectors during the planning period of 5 years in rounded figures, as calculated with the help of simultaneous equations are:

Sectors	*Investment (A) (Rs. crores)*	*Increase in*	
		Income (E) (Rs. crores)	*Employment (N) Million*
k	1850	370	0.9
C_1	980	340	1.1
C_2	1180	1470	4.7
C_3	1600	720	3.3

Total	5610	2900	10.0

We can sum up the Mahalanobis model thus:

In a given time period, in order to achieve a certain growth rate for the economy, the total investable amount has been divided in such a way that it leads to the required growth rate. But since the required growth rate is to be reasonably high, it can be achieved by expanding sector *k* and thereby producing larger quantities of investment goods. However, investment in sector *k* is bound to generate increased purchasing power and hence demand for consumer goods which require comparatively less capital but employ more labour. In this way a balance is sought to be established between the investment goods sector and consumer goods sector.

A CRITICAL APPRAISAL

The above solution of the Mahalanobis model and its practical application to India in the form of the Second Five-Year Plan proves that it possesses great utility as an instrument of development planning. But it has its limitations and weaknesses.[2]

1. Fails to Solve any Definite Welfare Function. It is essentially an operational model. As already explained, it arrives at an optimal solution out of a multiplicity of solutions in relation to a preference or welfare function already prescribed. The numerical solution of the model, however, does not point towards any definite welfare function without which it is not possible to arrive at an optimum allocation of resources.

2. Arbitrary Value of λ*k*. Mahalanobis assumes the value $\lambda k = 1/3$ but he does not ascribe any cogent reason for this, and simply says that "it would not be possible to go beyond this value under present conditions." He could very well choose any other value or any value for any other allocation parameter with perhaps better results. The assumption of $\lambda = 1/3$ is, therefore, somewhat arbitrary and may not help the planners in arriving at correct solutions for the optimum allocation of investments of the different sectors of the economy.

3. Technique not Applicable to Open Economy. Moreover, the use of λ

technique suggests that investment is a single homogeneous fund which is utilised for a single type of investment goods. Since investment goods are of heterogeneous type, this requires the use of an investment matrix. The λ technique can be applied as long as constant relative prices are assumed. It cannot, therefore, be applied to a model of open economy where the system is not homogeneous.

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2. Alak Ghosh, *New Horizons in Planning*, pp. 41-42; see also S. Tsuru, "Some Theoretical Doubts on the Plan-Frame", *Economic Weekly*, January 1957 Annual Number; and A. Mitra, 'A Note on the Mahalanobis Model', *Economic Weekly*, March 16, 1957; P.N. Mathur. 'A Note on Planning in India', *IEJ*, Nov. 4, 1957.

4. Supply of Agricultural Produce not Infinitely Elastic. The Mahalanobis model is based on the supposition that the supply of agricultural produce is infinitely elastic. This is untenable for the supply of agricultural produce because it has failed to meet the increased demand for food and raw materials ever since the beginning of the Second Five-Year Plan.

5. Supply of Labour also not Infinitely Elastic. It also assumes an infinitely elastic supply of labour which does not seem to be correct even though an underdeveloped country like India is faced with the serious problem of unemployment and under-employment. What is required for productive structure is not simple labour but skilled and trained labour and management.

6. Production Technique not constant. Like Harrod, Mahalanobis assumes the techniques of production to be constant during the Plan period. In fact, technological change is bound to occur during the process of development. Thus his model does not seem to take us very far.

7. Arbitrary Values for Structural Parameters. The values assigned to the structural parameters (the β's and θ's) are also arbitrary. In fact, it is extremely difficult to have a correct estimate-values of β's and θ's in an underdeveloped country which completely lacks in sufficient reliable data. Moreover, the assumption of independence between capital-output ratios and capital-labour ratios is not realistic. These parameters may change in the process of development.

8. Silent over Investment in a Mixed Economy. Further, the Mahala **nobis**

model fails to guide the planners in deciding the share of investments in the private and public sectors. It is silent with regard to **important** problem of development planning in a democratic **country with a** mixed economy.

9. **Ignores Factor Prices.** Another important defect of this model is that Mahalanobis ignores the pattern of factor prices while fixing targets on the basis of his model.

10. Closed Model. This model is confined to a closed economy. Mahalanobis assumed "that there will be no imports or exports of investment goods." Thus he ignored the impact of foreign trade on the variables of the model and deprived it of the element of reality.

11. Neglects Demand Functions. The Mahalanobis model concentrates exclusively on the supply functions and neglects the demand functions altogether. This is an unrealistic assumption and makes the growth model incomplete. "Actually speaking, many important considerations connected with market forces, psychological environment, popular enthusiasm and the emergence of specific pressure points are unavoidably involved in the course of development planning in a backward economy. The Mahalanobis model quietly ignores these important problems for the sake of mathematical simplicity."

12. Failure to Link up Investment Decisions with the Rates of Saving Required. According to K.N. Raj, one of the weaknesses of the Mahalanobis model is its failure to link up investment decisions with the rates of saving required. The necessity of high marginal rates of saving is one of the main considerations in favour of capital-intensive techniques of production.

13. Failure to Explain the Problem of Choice of Techniques. Prof. Raj further points out that from the theoretical angle, the Mahalanobis model fails to explain the problem of choice of techniques satisfactorily. He asks, if sector *C* is divided according to techniques of production, why should not sector *K* be similarly divided? Even in the manufacture of machine-tools there are more or less capital-intensive techniques. The case of labour-intensive techniques could have been perhaps stated more pointedly.[3]

Conclusion. Despite these practical and theorectical weaknesses, the

Mahalanobis model was instrumental in putting the Indian economy on the right path to development planning with the Second Five-Year Plan and paved the way for the subsequent bolder Plans.

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3. K.N. Raj "Growth Models and Indian Planning", *IER*, February, 1961, pp. 260-61.

PART - IV
DOMESTIC MEASURES FOR ECONOMIC DEVELOPMENT

CHAPTER

Capital Formation and Economic Development

MEANING OF CAPITAL FORMATION

Almost all economists lay emphasis on capital formation as the major determinant of economic growth. "The meaning of 'capital formation' is , that society does not apply the whole of its current productive activity to the needs and desires of immediate consumption, but directs a part of it to the making of capital goods: tools and instruments, machines and transport facilities, plant and equipment—all the various forms of real capital that can greatly increase the efficacy of productive effort. The essence of the process then, is the diversion of a part of society's currently available resources to the purpose of increasing the stock of capital goods so as to make possible an expansion of consumable output' in future."[1] Nurkse's definition relates only to the accumulation of material capital and neglects human capital. A proper definition must include both material and human capital. According to Singer, 'capital formation consists of both *tangible* goods like plants, tools and machinery and *intangible* goods like high standards of education, health, scientific tradition and research.' The same view has been expressed by Kuznets in these words: "Domestic capital formation would include not only additions to constructions, equipment and inventories within the country, but also other expenditure, except those necessary to sustain output at existing levels. It would include outlays on education, recreation and material luxuries that contribute to the greater health and productivity of individuals and all expenditures by society that serve to raise the morale of employed population." Thus the term capital formation covers material as well as human capital.

1. R. Nurkse, *op. cit.*, p. 2.

IMPORTANCE OF CAPITAL FORMATION

Capital formation (or accumulation) is regarded as one of the important and principal factors in economic development. According to Nurkse, the vicious circle of poverty in underdeveloped countries can be broken through capital formation. Due to low level of income in such countries, demand, production and investment are deficient. This results in the deficiency of capital goods which can be removed by capital formation. The supplies of machines, equipment and tools increase. The scale of production expands. Social and economic overheads are created. It is capital formation that leads to fuller utilisation of available resources. Thus capital formation leads to increase in the size of national output, income and employment thereby solving the problems of inflation and balance of payments, and making the economy free from the burden of foreign debts.

We will discuss below the importance of capital formation in detail.

The main purpose of economic development is to build capital equipment on a sufficient scale to increase productivity in agriculture, mining, plantations and industry. Capital is also required to construct schools, hospitals, roads, railways, etc. In fine, the essence of economic development is the creation of economic and social overhead capital. This is possible only if there is a rapid rate of capital formation in the country, that is, if a smaller proportion of the community's current income or output is devoted to consumption and the rest is saved and invested in capital equipment. As aptly pointed out by Lewis, the central problem in the theory of economic development is the process of raising domestic saving and investment from 4-5 per cent to 12-15 per cent of national income.

Investment in capital equipment not only increases production but also employment opportunities. Capital formation leads to technical progress which helps realise the economies of large-scale production and increases specialisation. It provides machines, tools and equipment for the growing labour force. Thus capital formation also benefits labour.

Capital formation leads to expansion of market. It is capital formation which helps remove market imperfections by the creation of economic and social overhead capital, and thus breaks the vicious circles of poverty both from the

demand side and the supply side.

Further, capital formation makes development possible even with increasing population. In overpopulated underdeveloped countries the increase in per capita output is related to the increase in capital-labour ratio. But countries aiming at raising the capital-labour ratio have to face two problems. *First,* the capital-labour ratio falls with increase in population so that large net investment is needed to overcome the diminution of capital-labour ratio. *Second,* when population is increasing rapidly, it becomes difficult to have sufficient savings for the required quantity of investment, reason being that a low per capita income keeps the propensity to save at a low level in such a country. The only solution to these problems is a rapid rate of capital formation.

Under-developed countries are faced with the problem of balance of payments because they mostly export primary products like raw materials and agricultural products, and import almost all types of manufactured, semi-manufactured and capital goods. Domestic capital formation is one of the important solutions to this problem of adverse balance of payments. By establishing import-substitution industries, the import of manufactured and semi-manufactured goods are reduced. On the other hand, with increasing production of all types of consumer and capital goods the composition of exports changes. Alongwith agricultural products and industrial raw materials, the exports of manufactured articles also start. Thus capital formation helps in solving the problems of balance of payments.

A rapid rate of capital formation gradually dispenses with the need for foreign aid. In fact, capital formation helps in making a country self-sufficient and reduces the burden of foreign debt. When a country borrows from foreign countries for long periods, it imposes a heavy burden on the future generations. With every loan the debt charges increase day-by-day which can only be repaid by levying more or/and higher taxes. The burden of taxes increases and money flows out of the country in the form of debt repayments. Therefore, it is capital formation that brings freedom from foreign aid, reduces the burden of foreign debt and makes the country self-sufficient.

The strains of inflationary pressure on a developing economy can be removed to a considerable extent by increased capital formation. The output of

agricultural products and manufactured consumer goods tends to increase with a rise in the rate of capital formation. On the other hand, when income increases with capital formation, it raises the demand for goods. In the short run, it is not possible to match this increased demand by increase in supply and this results in the development of inflationary pressure in the economy. It is, however, a steady rise in the rate of capital formation in the long-run that augments the supply of goods, controls inflation and brings stability in the economy.

Capital formation also influences the economic welfare of a country. It helps in meeting all the requirements of an increasing population in a developing economy. When capital formation leads to proper exploitation of natural resources and the establishment of different types of industries, levels of income increase and the varied wants of the people are satisfied. They consume a variety of commodities, their standard of living rises and their economic welfare increases.

Lastly, an increase in the rate of capital formation raises the level of national income. The process of capital formation helps in raising national output which in turn raises the rate and level of national income. Thus the rise in the rate and the level of national income depends on the increase in the rate of capital formation. Thus capital formation is the principal solution to the complex problems of underdeveloped countries, and is the main key to economic development.

REASONS FOR LOW RATE OF CAPITAL FORMATION

The rate of capital formation is low in LDCs. The reason is that they lack in those factors which determine capital formation. In fact, capital formation depends upon savings, on the institutions mobilising these savings and on the investment of these savings. The failure of these three stages of capital formation to operate properly is responsible for the low rate of capital formation in such countries. The rate of capital formation in LDCs is about 5 per cent, whereas in America it is 15 per cent and in West Germany and Australia about 25 percent.

The main reasons for low rate of capital formation in LDCs are the following:

Low Income. Large savings are essential for capital formation and savings depend upon the size of income. Since agriculture, industry and other sectors are backward in underdeveloped countries, the national output is low and so is the national income. As a result, per capita income is also low. On the other hand, the propensity to consume is very high, it is near unity. So almost the entire income is spent on consumption. Thus saving is not possible and the rate of capital formation remains low.

Low Productivity. Since the level of productivity is very low in such countries, the rate of growth of national income, saving and capital formation are also low. Their natural resources are either unutilised or misutilised due to lack of efficient labour and technological knowledge, non-availability of capital, etc. These factors stand in the way of increasing the income of the resource-owners so that they are unable to save and invest more and the rate of capital formation does not rise.

Demographic Reasons. LCDs possess such demographic features which keep the rate of capital formation at a low level. The growth rate of population is very high. On the other hand, the per capita income is low. As a result, the entire income is spent on bringing up the additional numbers, and little is saved for capital formation. Besides, the rapid increase in numbers aggravates the shortage of capital because large investments are required to equip the growing labour force even with obsolete equipment. Moreover, in such economies a large percentage of children in the total population entails a heavy burden on the parents in bringing them up and they are unable to save for capital formation. *Lastly*, such countries have a shorter life expectancy which means a smaller fraction of their population is available as an effective labour force. Since workers die in the prime of their lives, there are few adults to provide for large number of children. This brings down the per capita income further. Thus demographic reasons inhibit the rate of capital formation.

Lack of Enterprise. The lack of entrepreneurial ability is another factor responsible for low rate of capital formation in LDCs. ‘In fact entrepreneurship is regarded as the focal point in the process of economic development. But in LDCs the small size of market, deficiency of capital, lack of private property and contract, etc., retard enterprise and initiative, thus there is low rate of capital formation.

Lack of Economic Overhead. Existence of economic overheads is essential to make fruitful investment and to encourage enterprise, for capital formation depends on them to a considerable extent. But economic overheads like power, transport, communications, water, etc., are lacking in LDCs which retard enterprise, investment activities and the path of capital formation,

Lack of Capital Equipment. In such countries the rate of capital formation also remains low due to lack of capital equipment. Here, not only the capital stock is low, but even capital is deficient. The total capita! investment is hardly 5 to 6 per cent of the national income in LDCs whereas it is 15 to 20 per cent in developed countries. Due to shortage of capital, it is not possible to replace the existing capital equipment and even to cover its depreciation in such countries. As a result, the rate of capital formation remains at a low level.

Inequalities in Income Distribution. There are extreme inequalities in income distribution which keep the rate of capital formation low in such countries. But income inequalities do not imply larger savings. In fact, larger savings are possible only in the case of the top 3 to 5 per cent of the people in the income-pyramid. But these people invest in unproductive channels like gold, ornaments, precious stones, real estates, foreign currency, etc. This distorts real investment and, the rate of capital formation is low. -

Small Size of the Market. The small size of the market is another reason for the low rate of capital formation in LDCs. It is a big hindrance in the way of enterprise and initiative. People are poor in such countries. The demand for goods is limited due to their low income. Hence it is the small size of the domestic market to absorb the supply of new products. This keeps the rate of capital formation at a low level.

Lack of Financial Institutions. Another reason for the low rate of capital formation in such countries is the lack of financial institutions to procure funds for investment. Larger capital expenditure is required for productive purposes. But this is not possible because of the lack of properly developed capital and stock markets, and credit and banking institutions. As a result, sufficient savings cannot be mobilised for investment purposes and the rate of capital formation remains low.

Economic Backwardness. Economic backwardness is also responsible for the

low rate of capital formation in LDCs. Low labour efficiency, factor immobility, limited specialisation in occupation and in trade, economic ignorance, traditional values and social structure retard saving and investment, and prevent the rate of capital formation from increasing.

Technological Backwardness. Technological backwardness also stands in the way of capital formation. Obsolete techniques of production are used in such countries. As a result, per unit labour productivity and per unit capital productivity remain low. This situation keeps the national output and income low, and the rate of capital formation fails to rise.

Deficit Financing. One of the important sources of capital formation in such countries is deficit financing. But if it crosses the limits of safety then it tends to lower the rate of capital formation. It happens when deficit financing leads to an inflationary situation in the country. When prices rise, goods become dearer. As a result, consumers are required to spend a larger portion of their income on buying goods, and it becomes difficult to save. This retards capital formation.

Increase in Taxes. Taxes also retard and reduce capital formation. When governments increase the number and rates of taxes as a means of forced savings, the income of consumers is reduced. This may be due to both direct and indirect taxes. Direct taxes reduce income directly while indirect taxes reduce income by raising their prices. Thus savings and capital formation are retarded.

Demonstration Effect. According to Nurkse, one of the important reasons for low rate of capital formation in LDCs is the demonstration effect. Everybody has an urge to imitate the standard of living of his prosperous neighbours. Similarly, there is a tendency on the part of the people of such countries to emulate the higher consumption standards of advanced countries. This demonstration effect is usually caused by foreign films, magazines and visits abroad. As a result, the rise in income is spent on increased expenditure on conspicuous consumption and thus savings are almost static or negligible. Thus, the rate of capital formation fails to rise.

SOURCES OF SAVINGS

The rate of voluntary private savings is extremely low in LDCs because of the low level of income and a high propensity to consume. Even dissaving is common among low income households in India, Ceylon and Thailand as well as among working families in Mumbai, British Honduras and the Philippines.[2] However, there are some groups which receive very high income. They are the merchants, the landlords and the speculators. The savings of these *upper income groups* are seldom channelled into investment projects. Instead, they are utilised for speculative purposes and for hoarding in the form of gold and jewellery and for giving short-term loans at as high as 30 to 100 per cent interest rates per annum. They are spent in ways most likely to enhance prestige, *i.e.*, on conspicuous consumption, on traditional items, on palatial buildings fitted with luxury gadgets in western style and on luxury automobiles.

Besides the few rich, there are the limitless cultivators. Given the same income, they save more than the labourers working in urban areas. 'Peasants learn to be thrifty because they know how near they live to the brink of disaster.' Similarly, the money-lenders save more because their incomes are very high as compared to their consumption level. Rural sayings also arise in some of the underdeveloped countries from urban remittances or from overseas remittances. People belonging to rural areas but working in towns, in the armed forces or living in foreign countries remit large sums to their dependents.

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2. *UN, World Economic Survey,* 1966, pp. 29-30.

The wage and salary earning classes, better known as the middle class, are also a source of savings. But they save little because their inclination is more towards spending rather than saving, since their income is very low. Whatever little they save is spent on conspicuous consumption, to educate their children, to build a house or to meet unforeseen circumstances, etc. "However, the very fact that these savings are merely a postponement of future consumption, and are thus largely offset by other postponed consumption means that they are not important in the context of productive investment."[3]

Another important source is the *business* and *corporate savings* in the form of distributed and undistributed profits. The profit-making classes, having an

ambition for power, save more and thus invest more in productive enterprises. They are an important source of capital formation in the agricultural and industrial sectors. But they lack confidence in the security of long-term investments due to socialist leanings of the majority of underdeveloped countries. In fact, the problem of mobilizing domestic private savings is twofold: *firstly*, it is one of increasing business savings, and facilitating their most effective use: *secondly*, it is to stimulate individuals to, save more and make their savings available for financing of appropriate growth promoting investment. On the whole however, the expansion of private saving has been sufficient except in a few developing countries. But if national saving rates are to increase, it is from the private sector; that the resources ultimately have to come.[4]

Last but not the least is the role of the government as a saver. "One of the inexorable features of economic growth seems to be a rise in the share of the government, in the national income. At the lowest level of national income per head the share of the government in *under-developed countries* may be as little as 5 per cent whereas advanced industrial governments use upto 10 per cent or so of real resources for current purposes, apart from what they use for military purposes and for transfers (pensions, insurance payments, interest payments, etc.)."[5] So the capacity of the government to save in an LDC is limited due to the low level of income and large administrative expenses.

SOURCES OF CAPITAL FORMATION

The process of capital formation involves three steps: (i) increase in the volume of real savings, (ii) mobilisation of savings through financial and credit institutions, and *(iii)* investment of savings. Thus the problem of capital formation in underdeveloped countries becomes two-fold; *one*, how to increase the propensity to save of the people in the lower income groups, and *two*, how to utilise current savings for capital formation. This leads us to the sources of capital formation which are classified as domestic and external. The domestic sources from which savings can be mobilised.for capital formation are: increase in national income, reduction in consumption, savings drives, establishment of financial institutions, mobilisation of gold hoards, perpetuation of income inequalities, increasing profits, fiscal and monetary measures, by utilising disguised unemployed; etc. The external sources are:

foreign capital, restriction of consumption-imports and favourable terms of trade.

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3. Lewis, *op. cit.*

4. *World Economic Survey, op. cit.,* p. 26.

5. W.A. Lewis, op. *cit.*. p. 239. Italics mine.

We discuss these internal and external sources of capital formation below:

(1) Domestic Sources. The various domestic sources of capital formation are as follows:

(i) Increase in National Income. The first important step is to increase the national output or income which will tend to raise the income of the people. This can be done by utilising the existing techniques and employing resources more efficiently, by utilising unused resources productively, and by increased division of labour.

(ii) Savings Drive. Savings drives will also help solve the problem of augmenting savings. They require concerted efforts in the form of propaganda and social education. Savings is a matter of habit which can be inculcated by propaganda. People can be persuaded to save in their own interest or in the interest of the family, for imparting education to their children, for marrying them, for building a house or as a safeguard against old age, sickness or emergency. Similarly, issuing of savings certificates in the form of government bonds and annuities carrying a high rate of interest may be helpful in mobilizing savings. Further incentive to savings can be in the form of business gifts, lottery prizes and tax exemptions on the purchase of government bonds.

(iii) Establishment of Financial Institutions. It is common knowledge that much of the unspent current income is hoarded in cash, jewels, gold, etc., by the people in underdeveloped countries. Therefore, the need is to establish financial institutions where small savers can safely deposit their money with confidence. The setting up of a well-developed capital and money market by the Central bank can give further impetus in this direction. In order to stimulate small savings among the masses, attention should be paid to the starting of life

insurance, compulsory provident fund, provident fund-cum-pension-cum-life insurance schemes, opening up of savings banks and mobile banks in rural areas, and promoting savings through cooperative societies, including the establishment of service cooperatives and strong apex institutions like the central and state cooperative banks. "Such agencies will not only permit small amounts of saving to be handled and invested conveniently but will allow the owners of savings to retain liquidity, individually and finance long-term investment collectively."[6]

(iv) Rural Savings. Another important measure is to encourage rural savings for local needs which are understood and approved of by the savers. Government securities might be attached to particular development projects in rural areas. As the All India Rural Credit Survey Committee proposed, "These rural debentures should as far as possible be for specific projects of development in which the villager is interested in different degrees, according as they are of direct benefit to him, or to those with whom he shares fellowship of interest because of their belonging to his district or region or state."[7] The guiding policy should, therefore, be to link rural savings with local development projects. In this way, mobilization of rural savings might lead to more rapid development. Such voluntary savings can even lead to that "critical minimum" which is so essential for a "take-off."

(v) Gold Hoards. Another method is the mobilization of gold hoards. This is a useful, though a neglected method of capital formation. The government should issue gold certificates carrying a high rate of interest in lieu of the gold surrendered by the public. But people are not prepared to part with gold and jewellery and are thus reluctant to invest in gold bonds or certificates voluntarily. It is, therefore, essential that hoarding of gold, above a stipulated quantity, should be prohibited by law; private trading in gold should be regulated; and the use of pure gold for manufacturing ornaments should be banned in the country. Alongwith these measures, smuggling of gold into the country should be stopped. These measures are not likely to be successful unless gold is sold in the country at the international price.

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6. E. Nevin, *Capital Funds in Underdeveloped Countries,* p. 75.

7. *All India Rural Credit Survey (abridged,* ed.,) p. 267

(vi) Perpetuation of Income Inequalities. This is also regarded as one of the measures to achieve high rates of saving and investment. Since the mass of the people have a low marginal propensity to save in underdeveloped countries, it is the higher income groups with a high marginal propensity to save that can do saving and investment for capital formation. This had been one of the major sources of capital formation in 18th century England and early 20th century Japan. But widening of income inequalities is not feasible under the prevailing political climate in underdeveloped countries. Moreover, it is not definite that the wealthy classes may utilise their savings for productive investments, as was done by the British entrepreneurs of the 18th century. Rather the tendency is to spend on conspicuous consumption re-inforced by the international demonstration effect. In some of the African and Latin American countries where the governments are not watchful, the declining influence of the wealthy classes has led to the flight of domestic capital into the safe vaults of banks in developed countries.

(vii) Increasing Profits. Prof. Lewis[8] is of the view that the ratio of savings to national income is a function not just of inequality, but precisely of the ratio of profits to national income. He maintains that voluntary savings form a significant large share of national income only where inequality of income distribution is such that profits are a relatively large share of national income. If there is unequal distribution of income and the society's upper level income accrue to the landlords or traders, there is little chance of providing voluntary savings to finance investments. Lewis believes that even if profits, interest and rental incomes as a whole are a small share of national income in an underdeveloped country, savings can be increased from 5 to 12 per cent by raising the profit rate. The share of profits in the national income can be increased by expanding the capitalist sector of the economy.

In the *first* place, some legal safeguards should be provided to private investors against arbitrary depredations.

Secondly, the technique of borrowing by private enterprise should be changed in order to minimize the risk of capital loss. Industrial banks and other specialized institutions like the government sponsored finance and development corporations and investment trusts should be set up.

Thirdly, the capitalist sector is likely to expand rapidly if investment opportunities are very profitable. In the initial stages of development, a rise in productivity goes into profits. Productivity increases due to an unlimited supply of labour at low wages, technological progress, expansion of the market, geographical discoveries and the expansion of social overheads. The more rapidly the opportunities for productive investments expand, the faster the profits grow, and the greater is the capital formation.

Fourthly, this process is also accelerated by mild and intermittent doses of inflation. A mild dose of inflation increases profits relatively to other incomes. So when profits rise, there is increased investment which increases the rate of capital formation. But profit can grow even in the absence of inflation due to other institutional and technological changes mentioned above. Therefore, says Prof. Lewis, "The correct explanation of why poor countries save so little is not because they are poor but because their capitalistic sectors are so small." They can increase their rate of capital formation by raising profits relatively to national income; possibly without inflation. To this end, Lewis suggests that those who live on *earned incomes* particularly on ground rents, should be taxed heavily and the proceeds given to capitalists who live on profits unless the former agree to change themselves into the latter like the Japanese landed aristocracy. Thus profits can be increased by giving subsidies and tax rebates, by providing adequate supply of raw materials and capital equipment, by restricting imports of competitive products, by controlling wages and trade unions and by government purchases of the goods of the industries. These measures might, however, create vested interests and lead to maldistribution of resources within the economy. Prof. D.R. Gadgil believes that the raising of profits to increase savings for capital formation may lead to social unrest and may even fail to produce socially desirable investment since the profit making classes are not necessarily interested in the welfare of the masses.[9]

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8. W.A. Lewis, *op. cit.,* pp. 227-29.

(viii) Fiscal Measures. Since sufficient voluntary savings are not forthcoming for capital formation in an underdeveloped economy, the government is in a better position to mobilize them through various fiscal and monetary measures. These measures may be in the form of a budgetary surplus through increase in taxation, reduction in government expenditure, expansion of the

export sector, raising money by public loans and even by deficit financing. Besides, the government can increase savings by running public undertakings more efficiently so that they show larger profits. Above all, the government should evolve a growth-oriented long-term savings policy so that savings should increase automatically as development gains momentum. Let us discuss these measures briefly.

Taxation is one of the major and most effective instrument of fiscal policy for reducing private consumption and transferring resources to the government for productive investment. Taxation helps capital formation in two ways: *(i)* by transferring private resources to the state for utilisation in the desired channels; and *(ii)* by providing incentives to the private sector to increase production. The *first* point further raises two problems: how much taxation should be raised and how should it be allocated? According to Prof. Lewis, an underdeveloped country should raise at lest 20 per cent of its national income through taxation. Out of this, 12 per cent should be utilised on current expenditure and 8 per cent on capital investments in the public sector.

The *second* purpose of *taxation* (of providing incentives to private enterprise) involves the types of taxation and the rates to be levied. Progressive *direct taxes* on personal incomes, wealth, expenditure, etc. should be so levied that they do not adversely affect the incentive to work, save and invest. They should aim at reducing the tendency of the wealthy class to conspicuous consumption, capital flight, hoarding, and speculation. The decision about rates of taxes is, however, the most ticklish problem, for it cannot be said with definiteness which rate will encourage or discourage private enterprise.

Indirect taxes also provide incentives for development by reducing consumption and encouraging the masses to save more. Moreover, such taxes help in collecting funds which cannot be otherwise collected from the mass of the people. High rates on luxuries and low rates on articles of consumption are the most accepted principles of indirect taxes. Besides, import duties on luxury articles restrict their consumption and at the same time bring revenue to the state for productive investment. Taxation of export incomes and levying of export duties on agricultural and industrial raw materials are other fruitful sources of development finance.

Public borrowing is also a useful tool for diverting resources from

unproductive to productive channels. But its scope is limited in underdeveloped countries because of the low levels of income and savings, and high propensity to consume. Besides, there is lack of organised money and capital markets. To make public borrowing a success, concerted campaign by propaganda and social education is essential. Further, a network of intermediate agencies should be set up in the form of savings banks, commercial banks, insurance companies, unit trusts, social security institutions and a well-organised bill market. Nurkse also suggests froced loans if voluntary public borrowing does not succeed.

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9. D.R. Gadgil, *Economic Policy and Development,* p. 181.

(ix) Inflation. If sufficient funds are not forthcoming for capital formation, inflation is the most potent measure. It is regarded as a hidden or invisible tax. When prices rise, they reduce consumption and thus divert resources from current consumption to investment. The government creates inflation by issuing more currency into circulation to meet its requirements. But inflation raises savings at the cost of the standard of living of the masses. The fixed income groups are the most hard hit. Discontentment increases among the masses, unions fight for higher wages and productivity is adversely affected. Rising prices and costs also reduce exports to world markets. Thus, inflation, as a method for capital formation, brings more harm than benefit unless counter-inflationary measures are adopted by the government.

(x) Profits of Public Corporations. The government can also mobilise domestic savings for productive investment by establishing public corporations. Public corporations receive funds in the form of equity capital and bonded debt from the open market, and in countries like India, directly from the government. They also obtain foreign loans or collaborate with foreign enterprises. Public corporations are a substitute for private enterprise in underdeveloped countries. They generally utilise their resources as a revolving fund. But in certain under developed countries where public corporations are established as state enterprises, their profits are utilised for capital formation. This is being done in the case of public enterprises set up by the Central and State Governments in India. In many underdeveloped countries like India, Philippines, Columbia and Brazil, public corporations have been set up for financing the establishment and running of private enterprises. Similarly, they

have been formed as investment trusts. The establishment of such varied public corporations helps organise capital and money markets for the mobilisation of domestic savings for capital formation.

(xi) Utilisation of the Disguised Unemployment. According to Nurkse, one of the important source of capital formation is the concealed saving potential contained in rural underemployment in overpopulated, underdeveloped countries. The disguised unemployed workers contribute practically little or nothing to output, *i.e.*, their marginal productivity is zero or negligible. Such unproductive workers can be removed from the land without a fall in agricultural output and employed on various capital projects such as irrigation, roads, house building, etc., and they can be a fruitful source of capital formation. The newly employed workers can be provided simple tools from the farms by the reorganisation of agriculture or by importing them from abroad or by getting the same made by the workers. It is, however, assumed that food will continue to be provided to the newly employed workers by their relative-workers on the farms without any transport costs and at the same time maintaining their own consumption level. In this way, mobilization of the disguised unemployed as saving potential becomes self-financing. Nurkse's view precludes the payment of wages to workers. If wages are paid to workers they will spend on foodstuffs and thus raise the incomes of the agriculturists working on the farms. This increased income can be taxed to finance the investment projects. When the investment projects are completed, they will tend to raise output and income which can also be taxed and utilised for further investment.

(2) External Sources. Domestic sources for capital formation are required to be supplemented by the following external sources:

(i) Foreign Aid. In the absence of adequate domestic resources for capital formation, it is necessary to import foreign capital in the form of loans and grants from advanced countries without any 'strings.' But the best course is to start joint ventures whereby foreign investors bring technical know-how alongwith capital, and they train local labour and enterprise. Capital can also be imported indirectly by paying for through exports. This is the best policy because exports pay for imports. But it is not possible for a backward economy to increase its exports to the level of capital imports in the initial stage of development.

(ii) Restriction of Imports. Another important external source of capital formation is the restriction of consumption imports. All luxury imports should be restricted and the foreign exchange so saved should be utilised in importing capital goods. This measure can be successful only if the domestic income saved on imported consumer goods is not utilised on luxury and semi-luxury goods manufactured at home. If consumers start spending more on domestic consumer goods, the increase in the import of capital goods will be offset by reduction in domestic investment because resources will be diverted from domestic capital production to increased spending on consumer goods. An increase in domestic saving is, therefore, essential if the restriction of luxury imports is to lead to increase in net capital formation.

(iii) Favourable Terms of Trade. Similarly, if the terms of trade move in favour of an underdeveloped country, it is in a position to import large quantities of capital goods. To take advantage of the favourable terms of trade, it is essential that increase in domestic income due to larger export earnings should be saved and invested productively. If the extra income thus earned is spent on consumer goods, new saving will not take place for capital formation. Since improvement in the terms of trade is not an automatic source of capital formation, Nurkse suggests that this saving should be extracted through taxation 'to give the country a command over additional imports of investment goods.'

Conclusion. Capital formation is thus an important determinant of economic development. It would, however, be an over-simplification to regard economic development as a matter of capital formation alone, neglecting political, social, cultural, technological, and entrepreneurial factors.

CHAPTER

Role of Agriculture and Industry in Economic Development

AGRICULTURE AND ECONOMIC DEVELOPMENT

The contribution of agriculture to economic development lies in: (*i*) providing more food to the rapidly expanding population; *(ii)* increasing the demand for industrial products and thus necessitating the expansion of the secondary and tertiary sectors; *(iii)* providing additional foreign exchange earnings for the import of capital goods for development through increased agricultural exports; *(iv)* increasing rural income to be mobilized by the state; (v) providing productive employment; and (vi) improving the welfare of the rural people. We will discuss these one by one.

Providing more food to the rapidly expanding population. In LDCs, food production dominates the agricultural sector. When output expands with increased productivity, it increases the income of the farmers. Rise in per capita income leads to substantial rise in the demand for food. In such economies, the income elasticity of demand for food is very high. It usually ranges between 0.6 and 0.8 per cent. Moreover, the increase in the growth rate of population due to a rapid decline in the mortality rates and slow reduction in fertility rates tends to raise further the demand for food. Besides, the demand for food increases with the expansion of population in towns and industrial areas Taking these factors into consideration, the increase in farm output should be at a higher rate than the rate of increase of food demand. In a situation where the increased production of agricultural commodities lags behind the growth in demand for them, there will be a substantial rise in food prices. To offset domestic shortage and prevent rise in prices, food may be imported from abroad but it can be at the cost of capital goods needed for development. The state may also introduce price controls, rationing and compulsory food collection. All this emphasizes the importance of increase in

food production in LDCs.

A rise in rural purchasing power, as a result of the increased agricultural surplus, is a great stimulus to industrial development. The market for manufactured goods is very small in an underdeveloped country where peasants, farm labourers and their families, comprising typically two-thirds or four-fifths of the population, are too poor to buy any factory goods in addition to whatever little they already buy. There is lack of real purchasing power reflecting the low productivity in agriculture.[1] The basic problem thus is low investment-returns caused by the small size of the market. Increased rural purchasing power caused by expansion of agricultural output and productivity will tend to raise the demand for manufactured goods and extend the size of the market. This will lead to the expansion of the industrial sector. Moreover, the demand for such inputs as fertilizers, better tools, implements, tractors, irrigational facilities in the agricultural sectors will lead to the greater expansion of the industrial sector. Besides, the means of transport and communications will expand when the agricultural surplus is to be transported to urban areas and manufactured goods to the rural areas. The long-run effect of the expansion of the secondary and tertiary sectors will be towards higher profits in them whether they are operated in the private or the public sector. These profits will tend to increase the rate of capital formation through their reinvestment. This is what Kuznets calls the “market contribution” of agriculture when it trades with others.

Underdeveloped countries mostly specialise in the production of a few agricultural goods for exports. As output and productivity of the exportable goods expand, their exports increase and result in larger foreign exchange earnings. Thus agricultural surplus leads to capital formation when capital goods are imported with this foreign exchange. As development gains momentum due to industrialization, the proportion of agricultural exports in country’s total exports is likely to fall as they are needed in larger quantities for domestic production of imported articles. Such articles are import substitutes and conserve foreign exchange. Similarly, increased marketed surplus of foodgrains leads to a net saving of foreign exchange, as the economy tries to achieve the goal of self-sufficiency in food production. Larger production of food and export crops not only conserve and earn foreign exchange but also lead to the expansion of the other sectors of the

economy. Foreign exchange earnings can be used to build the efficiency of other industries and help the establishment of new industries by importing scarce raw materials, machines, capital equipment and technical know-how. Kuznets calls it the "product contribution" of agriculture which *first* augments the growth of net output of the economy, and *second*, the growth of per capita output.

An underdeveloped country needs large amount of capital to finance the creation and expansion of the infrastructure and for the development of basic and heavy industries. In the early stages of development, capital can be provided by increasing the marketable surplus from the rural sector without reducing the consumption levels of farm population. According to **Johnston and Mellor**, "An increase in agricultural productivity implies some combination of reduced inputs, reduced agricultural prices or increased farm receipts."[2] Labour as the principal input can be a source of capital formation when it is reduced on the farm and employed in construction works. But the possibility of utilising unskilled surplus farm-labour on capital projects requiring skilled labour is limited. The *second* possibility of increasing capital formation through reduced agricultural prices is also not feasible in the early stages of development when the rise in prices is inevitable. Reduction in agricultural prices is possible in the long-run but democratic countries may not be able to follow this policy for political reasons. A more practicable solution is to stabilise the prices of farm products. The *third* possibility of increasing farm receipts is perhaps the best way of capital formation. This can be done by mobilising increased farm income through agricultural taxation, land revenue, agricultural income tax, land registration charges, school fees, fee for providing agricultural technical services and other types of fees that cover all or part of the cost of services provided to the farm population. But "political and institutional problems make it difficult to translate the increased potential for saving and capital accumulation, made possible by increased agricultural productivity, into an actual increase in investment," in underdeveloped countries. According to **Wald**, special assessments have had their widest application in the United States. In view of the fact that they are specially designed for financing such development projects as irrigation works, flood control system and certain classes of roads, all of which are extremely important for underdeveloped countries."[3] Except for betterment levy in a few states no other assessment exists in India. Earnings from land

revenue are on the decline and agricultural income tax is not favoured due to political reasons. Wald, therefore, warns underdeveloped countries like India that "*the penalties of too light taxation of agriculture are a stagnating farm sector, a financially starved public sector and a retarded rate of economic growth in the country as a whole*." Thus in countries where agriculture dominates, the taxation of agriculture in one form or another is essential for mobilising agricultural surplus in order to accelerate economic development. Kuznets calls it the "factor contribution" of agriculture when there is a transfer of resources to other sectors, these resources being productive factors.

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1. R. Nurkse, *Patterns of Trade and Development.*

2. B.F. Johnston and J.W. Mellor, 'The Role of Agriculture in Economic Development',*A.E.R.,* September, '1961.

Agriculture also expands and diversifies employment opportunities in rural areas. As agricultural productivity and farm income increase non-farm rural employment expands and diversifies. Landless and marginal farmers are primarily engaged in non-agricultural pursuits which include the manufacture of textiles, furniture, tools, handicrafts, leather and metal working; processing, marketing, transport, repair work; construction of houses and other buildings; education, medicine and other services. All these activities satisfy local demand.

Lastly, increase in rural income as a result of the agricultural surplus, tends to improve rural welfare. Peasants start consuming more food especially of a higher nutritional value in the form of superior quality cereals, eggs, ghee, milk, fruits, etc. They build better houses fitted with modern amenities like electricity, furniture, radio, fan, etc. Provide themselves with bicycles, motor cycles, watches, readymade garments, shoes, etc. They also receive direct satisfaction from such services as schools, health centres, irrigation, banking, transport and communication facilities. Thus increased agricultural surplus has the effect of raising the standard of living of the mass of rural people.

ROLE OF INDUSTRIALISATION

Industrialisation is the process of manufacturing consumer goods and capital goods and of creating social overhead capital in order to provide goods and

services to both individuals and businesses. As such industrialisation plays a major role in the economic development of LDCs.

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3. H.P. Wald, *op. cit.*

Industrialisation is a pre-requisite for economic development as the history of advanced countries shows. For development, the share of the industrial sector should rise and that of the agricultural sector decline. This is only possible through a policy of deliberate industrialisation. As a result, the benefits of industrialisation will "trickle down" to the other sectors of the economy in the form of development of agricultural and service sectors leading to the rise in employment, output and income.

In overpopulated LDCs there is overcrowding on the land, holdings are subdivided and fragmented, and farmers practise traditional agriculture. For rapid development, LDCs cannot afford to wait for changes in farm practices to take place. Therefore, LDCs must begin with industrial development to supply fertilisers, farm machinery and other inputs so as to increase efficiency on the farm.

Again, industrialisation is necessary in order to provide employment to the underemployed and unemployed in the agricultural sector. In overpopulated LDCs, large number of people are underemployed or disguised unemployed whose marginal product is zero or negligible. They can be transferred from agriculture to industry with little or no loss in agricultural output. Since the marginal product of labour is higher in industry than in agriculture, transferring such workers to the industrial sector will raise aggregate output. Thus overpopulated LDCs-have no choice but to industrialise.

Industrialisation is also essential in LDCs because it brings increasing returns and economies of scale while agriculture does not. "These economies reside in training, stimulating communication, interaction within industry (inter-sectoral linkages), demonstration effects in production and consumption, and so on. Rural society tends to be stagnant, urban society dynamic. Since industrialisation brings urbanisation, it is superior to the stimulation of agriculture."

Further, the LDCs need industrialisation to free themselves from the adverse

effects of fluctuations in the prices of primary products and deterioration in their terms of trade. Such countries mainly export primary products and import manufactured goods. The prices of primary products have been falling or remaining stable due to protectionist policies of advanced countries, while the prices of manufactures have been rising. This has led to deterioration in the terms of trade of the LDCs. For economic development, such countries must shake off their dependence on primary products. They should adopt import substituting and export-oriented industrialisation.

The case for industrialisation in the LDCs also rests on the psychological boost which such a policy provides to their citizens in marching towards modernisation. Industrialisation is viewed as a matter of pride by every LDC, for it implies using the new technology, new and diverse skills, larger enterprises and more large cities. Moreover, incomes rise rapidly in the industrial sector which are saved and invested for creating more demand for goods and services. Since industrialisation is followed by urbanisation, employment opportunities and incomes increase.

People enjoy the fruits of modernisation in the form of a variety of goods and services available in urban centres due to industrialisation. These also affect the rural sector through the demonstration effect. Thus industrialisation tends to raise the living standards and promotes social welfare.

Finally, industrialisation brings social transformation, social equality, more equitable distribution of income and balanced regional development in the process of economic development.

A CRITICAL APPRAISAL

The policy of industrialisation followed by the LDCs in the early phase of their development has not brought the expected economic and social benefits. It has failed to reduce inequalities of income and wealth, unemployment, and regional imbalances. Even the pace of development has been uneven with the neglect of the growth of other sectors. Moreover, industrialisation has created such serious problems as: "(*i*) rural stagnation, (*ii*) the mushrooming growth of the urban underclass, (*iii*) education poorly geared to the development needs, (*iv*) organisational "power failures" in government bureaucracies, and

(*v*) excessively high rates of growth of the population and the labour force." [4]

Therefore, economists have veered round to the view that there is no basis for the argument that development should be launched with industrialisation. Rather, the process of development should be interwoven with the harmonious growth of agriculture and industry. In fact, in most LDCs successful industrialisation has been supported by sustained agricultural development.

INTERRELATIONSHIP BETWEEN AGRICULTURAL AND INDUSTRIAL DEVELOPMENT

Debates have centred around the relative importance to be assigned to agriculture versus industry. But this dichotomy is often overdrawn. Experience has shown the limitations of overemphasising industrialisation, and it is increasingly recognised that agricultural progress must have a vital role in the development process. The earlier confrontation of industrial development versus agriculture has been shown to be a false issue, and the concern now is rather with the inter-relationship between industry and agriculture and the contribution that each can make to the other."

In the LDGs, more people are engaged in agriculture for their livelihood than in the industrial and other sectors of the economy. Agricultural growth provides food for the growing non-agricultural labour force and raw materials for agro-based industries, stimulates domestic demand for industrial goods, increases savings and tax revenue to be utilised for further development, earns more foreign exchange to finance imports of capital, intermediate goods and raw materials for industrialisation, and facilitates the development of labour-intensive village, small and medium industries in rural and urban areas.

Since agriculture provides employment to more than 70 per cent of the population in the early stages of development, increases in agricultural production and productivity, raise rural incomes. Rising rural incomes have strong multiplier effects in that they increase the demand for domestic non-agricultural goods and services which, in turn, increase the income of those providing the goods and services.

As rural income rise due to increasing agricultural yield, the increase in the domestic demand for industrial goods brings rapid gains in industrialisation. Besides, increase in industrial output of consumer goods needed by the rural population, the output of fertilisers, pesticides, agricultural tools, implements, and other intermediate manufactured goods required by the farm sector also increases. Moreover, with the diversification of agricultural activities, a number of labour-intensive village and small enterprises are set up in the rural areas. These provide further fillip to industrialisation.

When there is agricultural progress, some of the resources for industrialisation come from agriculture. In fact, increased agricultural productivity implies a large marketable surplus and a redistribution of income in favour of the rural sector. Industrialisation requires the reallocation of funds towards the modern sector along with rising agricultural incomes. Rising farm incomes is mopped up through land taxes and betterment levies, and the mobilisation of rural savings through savings drives and such financial institutions as co-operative banks, rural banks, etc. They play an important part in channelising rural savings for industrialisation.

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4. Clark Kerr, *et. al.*, "Postscript to Industrialisation and Industrial Man", *I.L.R.*

Increasing yields of agricultural products for exports help finance large imports of raw materials, intermediate and capital goods for industrial production. Similarly, by raising their food production, the LDCs save the foreign exchange for industrial development. On the other side, industrialisation favourably affects agricultural development in a number of ways.

First, with industrialisation income rise rapidly which increase the demand for such agricultural commodities as milk, vegetables, eggs, poultry, etc. Since the production of such commodities is labour intensive, agricultural production is greatly increased without enlarging farm acreage. This, in turn, provides more work to the rural population and raises incomes.

Second, industrialisation increases the availability of capital for the agricultural sector which helps in modernising agriculture and raising farm output.

Third, industrialisation followed by urbanisation opens vast job opportunities to the rural people who remit money back to their home. This, in turn, is utilised for buying inputs for farming or raising cattle, poultry, fisheries, etc. With improved means of transportation due to industrialisation, markets expand which facilitate the sale of such agricultural products at remunerative prices in the towns. Moreover, rural people living in villages near the towns and cities who work in city establishments also continue various part-time jobs at home which further raise their incomes.

Fourth, when urbanisation follows industrialisation, it provides larger facilities for education, travel and contact with new things and ideas which widen the horizon of the rural people, change their attitudes towards life and lead to modernisation.

Finally, industrialisation provides a wide and expanding range of consumer goods which encourages the agriculturists to increase farm produce. This, in turn, tends to raise their income to enable them to buy the consumer goods.

Thus both agricultural and industrial development are interrelated and each affects the growth of the other in ways mentioned above. The LDCs should, therefore, achieve the harmonious development of agriculture and industry for a steady growth of the economy.

CHAPTER

Monetary Policy in Economic Development

MEANING AND IMPORTANCE

Monetary policy refers to the policy of the monetary authority of a country with regard to monetary matters. It may be defined as that policy which deals with: *(a)* "the controls of financial institutions; *(b)* active purchases and sales of paper assets by the monetary authority as adeliberate attempt to effect changes in money conditions; and (*c*) passive purchases and sales of paper assets resulting from the maintenance of a particular interest rates structure, the stability of security prices or meeting other obligations and commitments."[1] Monetary policy in an underdeveloped country plays an important role in accelerating development by influencing the cost and availability of credit, by controlling inflation, and by maintaining balance of payments equilibrium. As development gains momentum, an appropriate monetary policy is all the more essential to provide an elastic credit supply to meet the requirements of a growing volume of trade, a rapidly increasing population, and an expanding monetized sector.

MAIN FEATURES OF MONETARY POLICY

According to Dr. J.D. Sethi, monetary policy can be taken to function in the following directions: *(i)* To have and also to make use of a most suitable interest rate structure, *(ii)* To achieve a correct balance between the demand and supply of money. *(iii)* The provision of proper credit facilities for a growing economy and stopping its undue expansion; and also the channeling of credit to users as consistent with pre-planned investment, *(iv)* The creation, working and expansion of financial institutions, (*v*) Debt management.[2]

1. J. D Sethi, *Problems of Monetary Policy in an Underdeveloped Country.*

These features of monetary policy in an underdeveloped country are discussed below:

1. Creation and Expansion of Financial Institutions. One of the aims of monetary policy in an underdeveloped country is to improve its currency and credit system. More banks and financial institutions should be set up to provide larger credit facilities and to divert voluntary savings into productive channels. Financial institutions are localised in big cities in underdeveloped countries and provide credit facilities to estates, plantations, big industrial and commercial houses. In order to remedy this, branch banking and unit banking should be extended to rural areas to make credit available to peasants, small businessmen and traders. For an effective monetary policy, however, the existence of a strong and powerful central bank is a necessary condition. In underdeveloped countries, the commercial banks provide only short-term loans. Credit facilities in rural areas are mostly non-existent. The only source is the village money-lender who charges exhorbitant interest rates. Besides, there are no properly organised and developed stocks and security markets. To remove these shortcomings, the central bank should play a dominant role in shaping a country's monetary policy.

The Central bank acts as the fiscal agent of the government and thus manages the public debt. It issues government bonds and securities itself and through other commercial banks in the country. Since there is no well-established bill market in an underdeveloped country, it is the central bank which can set up and organise a stocks and securities market.

The hold of the village money-lender in rural areas can only be slackened if new institutional arrangements are made by the central bank in providing short-term, medium-term and long-term credit at lower interest rates to the cultivators. A network of cooperative credit societies with apex banks financed by the central bank can help solve the problem. With the vast resources at its command, the central bank can also help in establishing industrial banks and financial corporations in order to finance large and small industries.

Lastly, the central bank acts as the guardian of the money market. It has sufficient powers to control commercial banks as it desires. 'Central bank

control of commercial banks ‘is a chief weapon of monetary policy.’ [3] It can induce banks to make provide medium and long-term loans by providing rediscounting facilities.

But monetary and financial institutions in themselves cannot be expected to be the primary and active movers of development in credit sense. Given the fundamental stimulus which comes from enterprise and entrepreneurship, the monetary system must then be sufficiently responsive to the stimuli that arise as development gains momentum.”[4]

2. A Suitable Interest Rate Policy. In an underdeveloped country the interest rate structure stands at a very high level. There are also vast disparities between long-term and short-term interest rates and between interest rates and different sectors of the economy. The existence of high interest rates acts as an obstacle to the growth of both private and public investment in an underdeveloped economy. A low interest rate is, therefore, essential for encouraging private investment in agriculture and industry. Since in an underdeveloped country businessmen have little savings out of undistributed profits, they have to borrow from the banks or from the capital market for purposes of investment and they would borrow only if the interest rate is low. A low interest rate policy is also essential for encouraging public investment. A low interest rate policy is a cheap money policy. It makes public borrowing cheap, keeps the cost of servicing public debt low, and thus helps in financing economic development. Even from the point of view of foreign investors, the availability of cheaper money for ‘complimentary funds” encourages private foreign investments. But a low interest policy is not an unmixed blessing in an underdeveloped country. It has certain disadvantages. It encourages borrowing and investment for speculative purposes and thus hinders the financing of productive investments. A low interest rate on government bonds makes them unattractive to the investors who are solely guided by the profit motive. A low interest rate also adversely affects the growth of saving in the economy.

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2. *Ibid.*, p. 94.

3. *Ibid.*, p. 103.

4. Meier and Baldwin, *op. cit.*, p. 395.

In order to discourage the flow of resources into speculative borrowing and investment, the Central bank should follow a policy of discriminatory interest rates, charging *high* rates for non-essential and unproductive loans and *low* rates for productive loans. But this does not imply that savings are interest-elastic in an underdeveloped economy. Since the level of income is low in such economies, a high rate of interest is not likely to raise the propensity to save. In the context of economic growth, as the economy develops, a progressive rise in the price level is inevitable. The value of money falls and the propensity to save declines further. Money conditions become tight and there is a tendency for the rate of interest to rise automatically. This would result in inflation. In such a situation any effort to control inflation by raising the rate of interest would be disastrous. Cheap money policy may thus lead to inflation if it is not accompanied by strict physical control. A *stable* price level is, therefore, essential for the success of a low interest rate policy.[5]

3. Debt Management. Debt management is one of the important functions of monetary policy in an underdeveloped country. It aims at proper timing and issuing of government bonds, stabilizing their prices and minimizing the cost of servicing public debt. It is the central bank which undertakes the selling and buying of government bonds and making timely changes in the structure and composition of public debt. The primary aim of debt management "is to create conditions in which public borrowing can increase from year to year and on a big scale without giving any jolt to the system. And this must be on cheap rates to keep the burden of the debt low."[6]

In order to strengthen and stabilize the market for government bonds, the policy of low interest rates is essential. For, a low rate of interest raises the price of government bonds, thereby making them more attractive to the public and giving an impetus to the public borrowing programmes of the government. The maintenance of structure of low interest rates is also called for minimizing the cost of servicing the national debt. Further, it encourages funding of debt by private firms. Dr. Sethi opines that to make the rate of interest play an active and useful role in any single market, the government should offer a wide range of securities. He maintains that if there is no demand for them, as is the case in an underdeveloped country, then the basic function of debt management policies is to create their demand.

However, the success of debt management, as an instrument of monetary policy, would depend upon the existence of well-developed money and capital markets in which wide range of securities exist both for short and long periods. To the extent these factors are absent, debt management becomes an Herculean task in an underdeveloped country.

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5. J.D. Sethi, *op. cit.*, pp. 94-97.

6. Ibid., pp. 106-107.

4. Proper Adjustment between Demand for and Supply of Money. Monetary policy is an important instrument in bringing about a proper adjustment between demand for and supply of money. An imbalance between the two will be reflected in the price level. A shortage of money supply will inhibit growth while an excess of it will lead to inflation. As the economy develops, the demand for money is likely to go up due to gradual monetization of the non-monetized sector, the increase in agricultural and industrial production and prices. The demand for money for transaction and speculative motives will also rise. So the increase in money supply will have to be more than proportionate to the increase in the demand for money in order to avoid inflation. There is, however, the likelihood of increased money supply being used for speculative purposes, thereby inhibiting growth and causing inflation. The monetary authorities should control the use of money and credit by an appropriate monetary policy and control speculative activities through direct physical controls. Thus in an underdeveloped economy, the supply of money and credit should be controlled in such a way that the price level is prevented from rising without affecting investment and production adversely.

5.Credit Control. Monetary policy should also aim at controlling credit in order to influence the patterns of investment and production in a developing economy. Its main objective is to control inflationary pressure arising in the process of development. This requires the use of both quantitative and qualitative methods of credit control.

Open market operations are not successful in controlling inflation in underdeveloped countries. The success of open market operations depends on: (*a*) the existence of a well-organised bill market; *(b)* the maintenance of fixed cash reserve ratios by the commercial banks; and (*c*) the absence of

rediscounting facilities from the Central bank. But these factors do not operate in such economies. The bill market is small and under-developed. Commercial banks keep an elastic cash ratio because the central bank's control over them is not complete. They are also reluctant to invest in government securities due to their relatively low interest rates. Moreover, instead of investing in government securities, they prefer to keep their reserve in liquid form such as gold, foreign exchange and cash. Only the last condition is operative because commercial banks are not in the habit of rediscounting or borrowing from the central bank.

In underdeveloped countries, *the bank rate policy* is also not so effective due to lack of bills of discount and the habit of the commercial banks to keep large cash reserves. Where the central bank is more powerful, it is able to influence the market rates by appropriate changes in the bank rate.

The use of the *variable reserve* ratio as a method of credit control is more effective than the open market operations and the bank rate policy. Commercial banks are able to create more credit in underdeveloped countries as they keep large cash reserves. The Central bank can check this expansion by raising the compulsory reserve ratio.

The qualitative credit control measures are, however, more effective than the quantitative measures in influencing the allocation of credit, and thereby the pattern of investment. In underdeveloped countries, there is a strong tendency to invest in gold, jewellery, inventories, real estate, etc., instead of in alternative productive channels available in agriculture, mining, plantations and industry. The selective credit controls are more appropriate for controlling and limiting credit facilities for such unproductive purposes. They are beneficial in controlling speculative activities in foodgrains and raw materials. They prove more useful in controlling 'sectional inflations' in the economy. They curtail the demand for imports by making it obligatory on importers to deposit in advance an amount equal to the value of foreign currency. This has also the effect of reducing the reserves of the banks in so far as their deposits are transferred to the central bank in the process. The selective credit control measures may take the form of changing the margin requirements against certain types of collateral, the regulation of consumer credit and the rationing of credit.

Of the various quantitative and qualitative methods of credit control, the latter are more effective than the former. But reliance on any one method would not suffice. Therefore, "alongwith *the qualitative methods of credit control not only* such methods as: (*a*) direct control of plant and equipment; *(b)* control of capital issues; (*c*) discriminatory taxes, and *(d)* control over imports and exports etc., will have to be instituted, but direct physical controls over commodity markets will have to be brought into make the general control policy a success."[7]

Conclusion. To conclude with Dr. Baljit Singh, "Development of banking facilities and savings institutions, reorganization of agricultural and industrial credit, integration and improvement of the money market, growth of a sound central banking, closing of free markets in gold and silver, replacement of hoards and above all currency reforms are urgently needed. It is only after these deficiencies are made good that the monetary apparatus of economically backward countries can prove effective in aiding construction and development. If a country fails in this task it would either go slow, even stagnate or be compelled to switch over its economic system to overall planning and reallocation of resources through direct state control."[8]

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7. *Op. cit.*, p. 102, Italics mine.

8. Baljit Singh, *Federal Finance and Underdeveloped Economy,* p. 70.

CHAPTER

Fiscal Policy in Economic Development

MEANING AND IMPORTANCE

Fiscal policy means the use of taxation, public borrowing, and public expenditure by government for purposes of 'stabilization' or 'development'. The use of fiscal policy for the purpose of promoting economic development is of recent origin. The Keynesian analysis of fiscal policy is applicable to advanced economies. The role of fiscal policy in advanced economies is to stabilize the rate of growth. In the context of an underdeveloped economy, the role of fiscal policy is to accelerate the rate of capital formation. It is designed as an instrument of economic development. In the Keynesian analysis, fiscal measures are used to reduce savings and raise the propensity to consume. But an underdeveloped country is confronted with a different problem altogether. In such an economy, the propensity to save is extremely low and the propensity to consume is very high. What is required is a curb on the propensity to consume in order to raise the propensity to save. Thus the Keynesian analysis has little relevance to underdeveloped economies. As Nurkse puts it, "There is no doubt that Keynes' *General Theory* has a bias against saving and in favour of spending...but one that is pernicious when transplanted to the conditions in which the underdeveloped countries find themselves."[1]

Fiscal policy plays a dynamic role in underdeveloped countries. In fact, an extensive use of fiscal policy is indispensable for economic development. Fiscal policy, in the words of Nurkse, "assumes a new significance in the face of the problem of capital formation in under-developed countries."[2] The per capita income and savings are extremely low in such countries. The few rich indulge in conspicuous consumption. A considerable portion of savings is dissipated in unproductive channels—in real estates, hoardings, jewellery,

gold, speculation, etc. Fiscal policy diverts all these into productive channels.

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1. R. Nurkse, *op. cit.,* p. 148.

Nurkse regards the country's incremental saving ratio—the marginal propensity to save—as the crucial determinant of growth.[3] The incremental saving ratio can be raised by government expenditure in creating social and economic overheads, banking and credit institutions and in establishing new industries. They will help raise employment, output and income levels in the country. Since the flow of voluntary savings is meagre in underdeveloped economies taxation is the most useful instrument for forced savings. Taxation" effectively curtails conspicuous consumption and other wasteful expenditure of the richer classes. Thus taxation is an important and useful fiscal instrument for reducing private consumption, and transferring idle resources for capital formation by the government. As the *UN Report on Taxes and Fiscal Policy* says, "Fiscal policy is assigned the central task of wresting from the pitifully low output of *underdeveloped* countries sufficient savings to finance economic development programmes and to set the stage for more vigorous *public* investment activity."[4]

In an underdeveloped country where monetary policy alone is ineffective due to the existence of underdeveloped money and capital markets, fiscal policy can be used an important adjunct to monetary policy in accelerating the rate of capital formation.

Fiscal policy also plays a significant role in the development plans of underdeveloped countries. Under planning, a balance has to be achieved both in real and money terms. In other words, a physical plan has to be matched by a financial plan. "The implementation of the financial plan and the achievement of balances in *real* and money terms obviously will have to rely largely on fiscal measures."[5]

Objectives of Fiscal Policy

Fiscal policy as a means of promoting economic development aims at achieving the following objectives:[6]

1. To Increase the Rate of Investment. Fiscal policy aims at the promotion and acceleration of the rate of investment in the private and public sectors of the economy. This can be achieved by checking actual and potential consumption and by raising the incremental saving ratio. Fiscal policy should also be used to encourage some and discourage other forms of investment. In order to raise the rate of investment, government should, in the first instance, undertake a policy of planned investment in the public sector. This will have the effect of increasing the volume of investment in the private sector. But the main problem in an underdeveloped country is to find out adequate financial resources for investment purposes in the absence of sufficient voluntary savings. Measures aimed at curtailing conspicuous consumption and investment in unproductive channels can make available some resources. Due to the non-availability of enough foreign capital, both private and public, the remedy is to raise the incremental saving ratio, the marginal propensity to save —through public finance, taxation and forced loans.[7]

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2. *Ibid*.. p. 143

3. Ibid.

4. *Op. cit.,* p. 3. Italics mine.

5. Raja J. Chelliah, Fiscal *Policy in Underdeveloped Countries,* p. 23. Italics mine.

6. The UN Report on *'Methods of Financing Economic Development in Underdeveloped Countries'* (p. 15)

> mentions the following four objectives of Fiscal Policy in the context of underdeveloped countries:
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> To correct excessive or harmful inequalities in the distribution of income and wealth and in doing so to expand internal markets and reduce unessential imports.
>
> To counteract inflation which might result from economic development.
>
> To provide incentives for desirable types of development projects and thus help to steer development into desirable directions.
>
> To increase the total volume of savings available for economic development.'

Dr. R.N. Tripathy[8] suggested six methods which the government may adopt in order to raise the incremental saving ratio for mobilisation of the requisite volume of developmental finance. They are: *(i)* direct physical controls; *(ii)* increase in the rates of existing taxes; *(iii)* imposition of new taxes; *(iv)* surplus

from public enterprises; (*v*) public borrowing of non-inflationary nature; and (*vi*) deficit financing.

Direct physical controls are most effective in curtailing consumption and unproductive investment. Though they are difficult to administer in an underdeveloped country, direct physical controls are a necessary adjunct to fiscal policy. Imposition of new taxes and increase in the rates of existing taxes on a progressive scale are also essential. Measures which curtail consumption include steeply progressive income taxe, luxury import restrictions, high duty on luxury imports, ban on the manufacture of luxury and semi-luxury goods at home or restricting their use by licensing or by imposing heavy excise duty. In order to restrict the use of savings in unproductive investment high progressive taxes on windfalls, on unearned incomes, on capital gains, on expenditure and real estates, etc., should be levied. Surpluses from public enterprises can accrue if they are run efficiently. But due to their high cost of operation in the initial stages, they do not lead to surpluses. Moreover, there are not many public enterprises to warrant enough surpluses in economies.

We may also add to Dr. Tripathi's suggestions the about inflow of external assistance to fill the deficiency of domestic savings. External assistance should be directed in those channels where private enterprise is not forthcoming. It should also be used to develop private enterprise itself. Besides, "fiscal policy in the shape of fiscal concessions such as investment and depreciation allowances, provision of finance and foreign exchange, tax holiday, development rebates, subsidies, etc., can contribute materially to the growth of investment in the private sector of the economy."[9]

Of all the methods, therefore, taxation is the most effective instrument of forced savings. Deficit financing in underdeveloped countries is always inflationary due to lack of complementary resources. Borrowing from the public does not bring enough money to the exchequer in the absence of a properly developed capital market. Further, it is likely to raise interest rates thus affecting investment adversely.

2. To Encourage Socially Optimal Investment. Fiscal policy should encourage the flow of investment into those channels which are considered socially desirable. This relates to the optimum pattern of investment and it is

the responsibility of the state to promote investment in social and economic overheads. Investment in transport, communications, river and power development, and soil conservation fall under economic overheads. While investment in education, public health and technical training facilities come under social overheads. These two categories of investments lead to external economies. They tend to widen the market, raise productivity, and reduce the cost of production.

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7. Nurkse, *op. cit.*, pp. 142-43.

8. *Public Finance in Underdeveloped Countries,* p. 56.

9. *Ibid., p* . 51.

Moreover, the creation of overhead capital is in keeping with the criterion of social marginal productivity. It creates external economies and thereby raises the marginal productivity of private investment. Thus private investment in useful and productive channels is encouraged.

But such investments requiring large funds cannot come from private enterprise which is lacking in initiative and capital. Moreover, returns on them cannot be expected to be either quick or direct. Therefore, it is the duty of the state to bear the burden of expenditure on social and economic overheads that will go a long way in accelerating the rate of capital formation.

3. To Increase Employment Opportunities. Fiscal policy should aim at increasing employment opportunities and reducing unemployment and underemployment. For this, the state expenditure should be directed towards providing social and economic overheads. Such expenditures create more employment and increase the productive efficiency of the economy in the long-run. In underdeveloped countries with a larger base of rural population, the state should undertake local public works of community development involving more labour and less capital per head. Besides undertaking the establishment of public enterprises, the government should also encourage private enterprise through tax holidays, concessions, cheap loans, subsidies, etc. In the rural areas, efforts should be made to encourage domestic industries by providing training, finance, and machines connected with them. Expenditure on all these short-term and long-term measures will go a long way not only in

eradicating unemployment and underdevelopment but also in increasing employment opportunities.

In fact, public money will go waste if the growth rate of labour force is not checked alongwith the above measures. Since in underdeveloped countries population grows at a very fast rate, the objective of increasing employment is closely linked to that of stabilising the growth rate of population. Rapid economic development is only possible if the rate of increase in employment opportunities and hence in income is much higher than the growth rate of population. Fiscal policy should, therefore, provide more social amenities with a greater emphasis on family planning. Unless population is controlled, the objective of increasing employment opportunities cannot be fulfilled.

4. To Promote Economic Stability in the Face of International Instability. Fiscal policy should promote the maintenance of reasonable economic stability in the face of short-run international cyclical fluctuations. An underdeveloped country is prone to the effects of international cyclical fluctuations due to the very nature of its economy. It mainly exports primary products and imports manufactured articles and capital goods. In the event of a fall in the prices of agricultural and mineral products in the world market, the terms of trade become adverse, foreign exchange earnings decline and national income falls. Due to the inelastic nature of the supply of agricultural and mineral products, an underdeveloped country cannot take advantage of increasing its exports when their prices fall. Similarly, it is unable to take advantage of a boom in the world market. An improvement in the terms of trade is not accompanied by an increase in output and employment. On the contrary, increased export earnings are dissipated in conspicuous consumption, real estate, speculation, etc. They also lead to inflationary pressures in the economy.

Fiscal policy plays a crucial role in maintaining economic stability in the face of external and internal forces. In order to minimize the effects of international cyclical fluctuations during a boom, export and import duties should be levied. Export duties can siphon off the windfall gains arising from the rise in world market prices. But heavy import duties on consumer goods and luxury import restrictions are also essential to curb the use of additional purchasing power. The success of fiscal policy, however, depends to the extent luxury import restrictions and export and import duties are used for domestic savings and capital formation. In a period of recession in the world market, export

earnings decline considerably and the export goods sector is hit hard. In such a situation, government should undertake large public works programmes through deficit financing. But injections of additional purchasing power would tend to raise the prices of consumer goods due to their inelastic supply in the short-run.

Fiscal policy should, therefore, be viewed from a longer perspective. It should aim at diversification of the economy—balanced growth of the various sectors of the economy. In order to reduce the effects of international cyclical movements, a contra-cyclical fiscal policy of deficit budgeting during *depression* and surplus budgeting during *inflatio*n is also called for. Such a policy should, however, be supplemented by appropriate monetary measures.

5. To Counteract Inflation. Fiscal policy should aim at counteracting inflationary tendencies inherent in a developing economy. In such an economy, there is always an imbalance between the demand for and supply of real resources. With increasing injections of purchasing power into the economy the demand rises but the supply remains relatively inelastic due to structural rigidities, market imperfections, and bottlenecks which impede the supply of essential goods. This leads to inflationary rise in prices. It may also tend to raise the demand for wages in the organized sector of the economy which may, in turn, push up costs and thus give a further fillip to rise in prices. The inflationary pressure will be still greater if large investments are directed to the capital goods industry to the neglect of the consumptive goods sector in *the* economy.

Direct taxes on progressive scale supplemented by commodity taxes are one of the effective fiscal measures for counteracting inflationary pressures in the economy. Such taxes tend to siphon off a large proportion of the rise in money income generated by the inflationary process. It is, however, imperative that the tax structure should be so manipulated that it does not adversely affect private investment. The aim of fiscal policy is not only to arrest the inflationary rise in prices but also to maintain some measure of stability in the general price level. For this, the fiscal role of the government should also include the removal of bottlenecks and structural rigidities, planned development of the various sectors of the economy, physical controls of essential products, their purchase and sale by the government, and granting of subsidies and protection to essential consumer goods industries in the economy. Above all, for fiscal

measures to be effective they must be supplemented with monetary measures. The latter have the added advantage of controlling credit expansion, mopping up additional purchasing power, and stimulating voluntary savings. To sum up, to control inflation in an underdeveloped country, fiscal and monetary measures should be so adopted that they do not clash with the overall objectives of economic growth and stability.

6. To Increase and Redistribute National Income. Lastly, fiscal policy should increase national income and redistribute it in such a manner that the extreme inequalities of income and wealth are reduced in the economy. The importance of removing these inequalities of income and wealth can hardly be exaggerated. Extreme inequalities of income and wealth create social cleavages, lead to economic and political instability, and stand in the way of economic development. On the one hand, the few rich roll in wealth and misuse their income on conspicuous consumption and inventories, real estate, gold, foreign exchange, speculation, etc., while on the other hand, the masses *groan* under *abject* poverty and misery. The aim of fiscal policy is to remove these extreme inequalities and direct these misdirected and misused resources into productive channels for economic development.

The redistributive role of fiscal policy consists in increasing the real income of the masses and reducing higher income levels. Direct government investment in social and economic overheads tends to increase the volume of output, employment and real income in an underdeveloped economy. The economic position of the masses improves and their standard of living rises. This policy would be all the more effective in raising living standard and reducing disparities in income if the government launches upon a programme of balanced regional development of the different sectors of the economy.

In order to reduce higher income levels, fiscal policy should include a highly progressive and broad-based tax structure. Such a tax structure comprises taxation of incomes, wealth, expenditure and estates, etc. It should also include a stiff taxation of articles of conspicuous consumption. But in the interest of economic growth, a redistributive tax policy should not impinge on entrepreneurial incomes and thus sap whatever little incentive to entrepreneurial activity is to be found in an underdeveloped country. A more formidable problem is one of implementation and collection of the various direct taxes. Political pressures, lack of tax morality and the absence of an

efficient and honest administration prevent fiscal policy from being an effective instrument of income redistribution in such countries. We should not, however, forget that one of the important objectives of fiscal policy is not only to redistribute income but also to increase national income. The latter is dependent on the former. Fiscal policy alone is insufficient to achieve these twin objectives fully due to lack of a proper atmosphere and machinery to enforce and collect the various taxes in an underdeveloped country. As Nurkse reminds us: "Not a change in the inter personal income distribution but an increase in the proportion of national income devoted to capital formation is the primary aim of public finance in the context of economic development."[10]

The success of fiscal policy in achieving these objectives depends on: (a) the amount of public revenue that it can raise, and (b) the amount and direction of public expenditure. The important fiscal means by which resources can be raised by the government are a budget surplus, taxation, and borrowing from the public and banks. These means should be used in such a way that they lead to economic growth and stability.

TAXATION AS THE MOST EFFECTIVE INSTRUMENT OF FISCAL POLICY

Of all the means, taxation is perhaps the most effective instrument of fiscal policy. A budget surplus may be achieved through higher prices and tax rates. Borrowing from the public is likely to raise interest rates thereby affecting investment adversely. While obtaining funds from the banks will tend to raise prices and divert resources, the actual efficacy of fiscal policy will thus depend on the country's taxation structure. "The importance of taxation is that the state enforces an act of savings, whereas the act of investment can be public, private, or a mixed institutional arrangement."[11] As the *Economic Bulletin for Asia and the Far East* states: "Taxation, therefore remains as the only effective financial instrument for reducing private consumption and investment, and transferring resources to the government for economic development."[12] For the purpose of promoting a country's economic development, taxation may be used to achieve the following objectives: (*i*) To put a curb on consumption and thus transfer resources from consumption to investment; (*ii*) to increase the incentives to save and invest; *(iii)* to transfer resources from the hands of the

public to the hands of the government in order to make public investment possible; (*iv*) to modify the pattern of investment; (*v*) to reduce economic inequalities; and above all (*vi*) to mobilise economic surplus. [13]

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10. *Nurkse, op. cit.,* p. 147.

11. Meier and Baldwin, *op. cit.,* p. 386.

12. Quoted in Raja J. Chelliah, *op. cit., p. 55.*

Importance of Taxation. We may discuss the role of taxation in economic development in the light of these objectives:

(*i*) Taxation is the most important instrument in curbing the increased demand for consumer goods generated by the development process. As individual income increase with development, they tend to raise the demand for consumer goods. Direct taxes curtail consumption by taking away a part of increased income of the higher income groups; while indirect taxes on essential commodities and non-essential luxury and semi-luxury articles reduce the consumption power of the low income groups as well. Thus the government is able to transfer resources through taxation from private consumption to public investment. Moreover, it is also through taxation that the state is in a position to control *inflationary pressures* within the economy. By draining off a part of increased income, taxes tend to bring down the total demand so as to match the available supply of consumer goods. Since the marginal propensity to import is high in such economies, it is necessary for the state to watch that the increased income do not lead to increased imports and thus create balance of payments difficulties. Import duties levied to check imports may bring greater pressure on domestic supplies of consumer goods, and accentuate inflationary tendencies. It, therefore, requires a careful and integrated choice of taxes to check inflationary pressure and bring stability in the economic system.

(ii) Taxation should not merely aim at obtaining larger revenue but should also act as an incentive to save and invest. Highly progressive direct taxes for raising more finance for public consumption and investment expenditure adversely affect the incentives to save and invest. Similarly, too many indirect taxes discourage private saving. Therefore, taxation should not be regressive in nature. Direct taxes should be so levied that while taking away a portion of

the increased income, they leave enough for those who save to invest. In this respect, property tax and expenditure tax are better than income tax. The former curtail consumption while a high income-tax discourages savings and investment. Fiscal concessions, such as investment and depreciation allowances, tax holiday, tax rebates,, etc., should be provided as an incentive to investment. Similarly, indirect taxes should curb conspicuous consumption and be not so heavy as to raise the prices of articles to such an extent that their production is affected adversely. Thus taxation should provide sufficient incentives to private saving and investment.

(iii) In an under-developed country, taxes are the most efficient way of transferring resources to the government for their more productive utilisation. In order to break the vicious circle of low income, low saving and low investment in such economies, public investment is required to be stepped up. Private enterprise is confined to small businesses and a few selected large enterprises producing consumer goods. They do not generate enough savings to be utilised for reinvestment. Moreover, the tendency is to invest these business savings in unproductive channels, such as in gold, real estates, speculative activities, etc. By levying taxes on income, land, property, expenditure, profits, wealth, etc., the government can siphon off increased incomes to the treasury for their proper utilisation through public investment. Thus taxation helps in transferring resources from unproductive to productive channels via public investment.

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13. *Ibid.*, p. 53.

(iv) Taxation should modify the pattern of investment in the economy. We have seen above that one of the functions of taxation in underdeveloped countries is to transfer resources from private sector to public sector. But this does not mean that taxation is aimed at supplanting private investment. Rather, taxation should encourage and redirect private investment into more productive channels. The government should provide sufficient incentives to private enterprise in the form of development rebate, tax holiday, accelerated depreciation allowance, etc., so that manufacturing industries are started and expanded within the economy. This will lead to larger profits which can be ploughed back for investment. Taxes should be such as not to reduce the volume of reinvestible funds. On the other hand, tax financed public investment

should be directed towards the creation of social and economic overheads like education, health, transport, power, and other services. Thus taxation should aim at encouraging and strengthening private investment alongwith public investment.

(*v*) One of the important objectives of taxation is to reduce the gap between the incomes of the rich and the poor. Reduction of inequalities of income and wealth require separate measures. Highly progressive taxation of total income tends to reduce the consumption and accumulation of wealth of the rich. But such a policy may adversely affect productive investment. So when a highly progressive income-tax is levied on individuals and corporations, it should be accompanied by certain exemptions in order to lessen the effects of. taxation on business investments. To reduce the concentration of wealth in the hands of few rich and inequalities of wealth, progressive taxation of gifts, inheritances, and wealth is suggested. Such taxes should be so levied that they do not lead to dissaving on the part of the tax payers. As observed by Prof. Kaldor, "In most underdeveloped countries, where extreme poverty co-exists with greater inequality in wealth and consumption, progressive taxation is, in the end, the only alternative to complete expropriation through violent revolution. It is the only alternative instrument for curbing the power of wealth, for mobilising resources for developing and for loosening the paralysing hold of traditional, social and economic relationship." Thus progressive taxation is essential for removing inequalities of income and wealth.

(*vi*) Taxation should mobilise economic surplus for development and continually enlarge its size. According to Prof. Chelliah, in underdeveloped countries agriculture contributes more than half the national output and a major part of it goes to the landlords, merchants and intermediaries. This is economic surplus which is the difference between actual current output and actual current consumption. Such surplus may also exist in other sectors of the economy. It is essential that in the early stages of development a large part of the surplus be mobilised into productive channels. In such economics the landlords, merchants and intermediaries are in the habit of investing this surplus in unproductive channels like gold, jewellery, real estates, speculative activities and conspicuous consumption. Therefore, the government should mobilise this surplus through increased land tax, agricultural income tax and special assessments like betterment levies for financing such development

projects as irrigation works, flood control system, improved agricultural services, etc. The latter also help in enlarging the size of economic surplus by increasing agricultural productivity and output. As pointed out by Prof. Kaldor, "The taxation of agriculture by one means or another has a typical role to play in the acceleration of economic development."

These objectives of taxation are in keeping with the broader objectives of fiscal policy enumerated in the preceding pages. The problem, however, is to build a taxation structure that is conducive to the attainment of these objectives. In an underdeveloped country the taxation base is narrow. So, in making a choice among the various types and kinds of taxes the state has to take into consideration, besides the above objectives, such matters as the country's taxable capacity, the administrative ability to enforce taxes and collect them efficiently and justly, and the effect of rising and increasing taxes on the social and political structure of the country.

ROLE OF PUBLIC BORROWING IN ECONOMIC DEVELOPMENT

Borrowing from the public can be another important source of capital formation in under-developed countries. This device is better than taxation. Taxation implies forced saving; borrowing is voluntary. The tax payer is never happy in paying a tax, for he does not expect to get his money back. A lender, on the other hand, gives his money on loan of his own accord to receive it back alongwith interest after a stipulated period. Unlike taxation borrowing does not adversely affect incentives to save and invest. The lure of interest is always there to increase the incentives instead.

Public borrowing acts as an anti-inflationary measure by mobilizing surplus money in the hands of the people in a developing economy. A successful public borrowing programme can be a useful tool of economic development by diverting resources from unproductive channels, *i.e.*, real estates, jewellery, gold, etc., to productive channels. Public borrowing is resorted to for specific development projects like power generation, irrigation works, roads, railways, etc. Thus it is a useful method of financing development projects.

But the scope of voluntary public borrowings is limited in underdeveloped

countries due to low levels of income, low savings and high property to consume of the masses. The few rich are not likely to be attracted by government loans which are not so lucrative as investment in real estates, gold, speculation, etc. The government is also not in a position to borrow much due to the absence of organized money and capital markets. The banking and financial institutions are very few and bonds or securities are not so popular. *Lastly*, popular confidence may be lacking in the financial and political stability of the government. Domestic borrowing can, however, increase as development gains momentum whereby income and savings tend to rise. In the meantime, certain measures can be adopted to increase the "extent of public borrowing by making loans more attractive and by tapping small savings.

Firstly, the government should discourage savings being spent in unproductive channels say, gold, jewellery, real estates and on ostentatious articles. The masses should be encouraged to save more. This can be done by education, propaganda and persuasion.

Secondly, there should be a network of intermediate agencies to attract savings from the people. The establishment of savings banks, commercial banks, insurance companies, unit trusts, social security institutions, etc., can induce people to save more.

Thirdly, a well-organized bill market should be established. There should be a variety of government bonds which would provide better marketability and competitive rates with private issues and through such special features as ready convertibility to each, acceptance of government securities at par with gold for tax payment by masses. *Lastly*, the success of public borrowing programme will depend on the extent of the confidence people have in the political and financial stability of the government. A rising level of real income with no threat of inflation will go a long way in making government borrowing a success.

Despite all these measures, if sufficient funds are not forthcoming in the form of voluntary loans, the government may have to resort to compulsory borrowing for the mobilization of resources for capital formation. Compulsory public borrowing is, therefore, justified in those underdeveloped countries where taxation and voluntary borrowing fail to bring adequate funds for development to the exchequer. Certain sections of the society who dissipate

a larger portion of their income in unproductive channels or derive special benefits from particular development projects may be forced to subscribe to government bonds. Nurkse justifies the use of compulsory borrowing in these words, “Since individuals are interested not only in their consumption but also in the size of their asset holdings, there is a case for forced loans as an alternative to taxation. They may be little more than tax receipts and yet make a difference to the incentive to work and to produce as was found during the war period when the unspendable cash reserves accumulated as a result of rationing thus made consumers feel much better off. Forced loans in place of taxation would be a method of forced saving in form as well as substance.” But it is not advisable for an underdeveloped country to rely on this method of development finance except for specific development projects and for a short period. Ultimately governments will have to depend on voluntary borrowing. The government of India’s voluntary borrowing programme has been a great success.

ROLE OF PUBLIC EXPENDITURE IN ECONOMIC DEVELOPMENT

In under-developed countries, private enterprise is reluctant to invest in risky channels and where returns on capital are not quick. The few rich lack in initiative and enterprise and invest in gold, jewellery, real estates, speculative activities, etc. A small number undertakes investments in consumer goods industries, plantations and mines. Under the circumstances, rapid economic development is only possible through public expenditure. It, therefore, devolves on the state to assume the responsibility of creating the infrastructure needed for progress. The state has larger financial resources and is in a better position to start economic and social overheads requiring long gestation periods. The role of public expenditure in economic development lies in increasing the growth rate of the economy, providing more employment opportunities, raising income and standard of living, reducing inequalities of income and wealth, encouraging private initiative and enterprise, and bringing about regional balance in the economy.

Public expenditure on the establishment of heavy and basic goods industries in the initial periods increases the growth rate of the economy. But investment in the capital goods sector may increase production in the long run. Therefore,

public expenditure should also be directed towards meeting the immediate needs of the economy. Such a pattern of public investment is essential to secure a balance between the demand and supply of goods in order to prevent inflationary tendencies. Public expenditure should, therefore, be directed towards increasing agricultural productivity to meet the growing demand for goods and raw materials, and increasing the supply of consumer goods by encouraging the establishment and expansion of the small industries sector which may also provide sufficient employment opportunities. The growth rate of the economy can be increased only when public expenditure fulfils the short-term and long-term objectives of the development plan.

Public expenditure on economic and social overheads provides large, employment opportunities, raises incomes and, above all, the productive capacity of the economy. When the state starts public works like the construction of roads, railways, power projects, canals, etc., it gives employment to millions of unemployed people in underdeveloped countries. The provision for such services helps to increase production, trade and commerce. Public expenditure on social overheads like education, public health, cheap housing, etc., makes the people healthier and efficient. It is the state which can create the “critical skills” needed for rapid development by investing in human capital.

Public expenditure also helps in improving the allocation of resources toward desired channels. In order to remove scarcities of food products during stringencies, the state opens fair price shops and may even subsidise food for the working classes to maintain their health and efficiency. It may fix minimum prices for foodgrains, and through state, trading and creation of buffer stocks encourage farmers to produce more. To increase the production of certain essential commodities and to end private monopoly in various spheres of production, the state may start public enterprises. It may also nationalize banks and public utility services in order to provide cheap and more efficient facilities to the people. Public expenditure can thus spread to all spheres of economic activities.

Under-developed countries are characterized by extreme inequalities of income and wealth. Public expenditure tends to lessen them. Expenditure on education, public health and medical facilities helps in human capital formation. As a result, the earning power of the working population is

enhanced. As economic development proceeds rapidly through rising public expenditure, the barriers to upward mobility are removed. Occupations expand and spread, providing more jobs to the people, and with the acquisition of skills, the level of wages tends to rise within the economy. Moreover, industrialization tends to increase the share of wages and decrease the share of profits in national income in the long run, and the gap between higher and lower income is narrowed.

Further, public expenditure helps in stimulating private enterprise through the establishment of state-owned financial and banking institutions to provide cheap credit, such as the Industrial Finance Corporation of India, the Industrial Development Bank of India, State Financial Corporations, the State Bank of India, etc. Public expenditure also encourages the agricultural and industrial sectors of the economy by means of grants, subsidies, tax exemptions, etc. Moreover, when the state spends on the creation of economic and social overheads like power, transport, education, etc., they pave the way for the establishment and expansion of the private sector. The creation of the infrastructure leads to external economies that are reaped by the private sector.

Last but not the least, public expenditure helps bring about regional balance in the economy. If things were left to market forces, commerce, banking, industries and almost all the main activities would be localised in a few selected regions, and the rest of the economy may be in a state of perpetual backwardness. As a matter of fact, economic development in India under the British rule was confined to a few regions like Maharashtra, and cities like Mumbai, Kolkata, Chennai, Kanpur and Ahmedabad. It is only through planned public expenditure that less developed areas can be developed by starting certain projects like the building of dam, digging canal, and starting some new industries there. The setting up of steel plants at Bhillai, Bokaro, Durgapur, Rourkela, the heavy electrical plants at Bhopal and Hardwar, and about eighty other public sector undertakings in the backward areas of the country are intended to bring about balanced economic development'. Thus public expenditure is one of the important instruments for accelerating development in underdeveloped countries.

CHAPTER

Deficit Financing as an Instrument of Economic Development

MEANING

The phrase 'deficit financing' is used to mean any public expenditure that is in excess of current public revenues. In advanced countries, deficit financing is used "to decribe the financing of a deliberately created gap between public revenue and public expenditure or a budgetary deficit, the method of financing being borrowing of a type that results in a net addition to national outlay or aggregate expenditure."[1] Thus government expenditure financed by borrowing from the public is included in deficit financing. Another method usually followed is deficit financing by "created money." Deficit financing in the context of an LDC has a different connotation. It excludes expenditure financed by borrowing from the public. In an LDC, income is low but the propensity to consume is high, thus voluntary savings are at a very low level. If investment is tied to the current level of voluntary savings, the growth of real income will be retarded. Savings will remain low and so will investment. Deficit financing is thus seen as a way of breaking this deadlock by forced savings. Moreover, budget-deficit financed by borrowing from the public implies simply diversion of existing resources for capital formation. But the term deficit financing is applied to that expenditure which is financed only by such means as tend to increase the total outlay in the country. As V.K.R.V. Rao puts it, "investment involves outlay, which constitutes either an addition to, or a re-allocation of national spending or both, as the case may be. It is only in the former case that investment outlay involves deficit financing."[2] According to the Indian Planning Commission, "The term deficit financing is used to denote the direct addition to gross national expenditure through budget deficits, whether the deficits are on revenue or on capital account. The essence of such a policy lies in the government spending in excess of the revenue it receives in

the shape of taxes, earnings of state enterprises, loans from the public, deposits and funds, and other miscellaneous sources. The government may cover the deficit either by running down its accumulated balances or by borrowing from the banking system (mainly from the central bank of the country and thus 'creating' money)."[3] Thus deficit financing includes: (*a*) withdrawal of past accumulated cash balances by the government, *(b)* borrowing from the central bank, and (*c*) issuing of new currency by the government. In India, these methods are in use.

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1. V.K.R.V. Rao, *Essays in Economic Development,* p. 105.

ROLE OF DEFICIT FINANCING[4]

Deficit financing is the most useful method of promoting economic development in LDCs. The nature of an LDC is such that sufficient private investment is not forthcoming due to various social, economic and institutional factors. Therefore, the responsibility of augmenting the *rate of net investment* in the economy devolves on the government. On account of the lack of sufficient resources to finance public investment, governments have to resort to the method of deficit financing.

Deficit financing may be used for the development of *economic* and *social overheads* such as construction of roads, railways, power projects, schools, hospitals, etc. By providing socially useful capital, deficit financing is able to break bottlenecks and structural rigidities and thereby increases productivity. Moreover, the fiscal apparatus in LDCs is neither efficient nor can it be easily made so to enforce the required savings needed for capital formation.

Further, deficit financing by increasing money income augments *community savings.* It is an effective instrument of forced saving. When the government resorts to deficit financing, it takes away real resources from the people. The transfer of resources takes place in a concealed manner when the government buys goods and services for its own use. There being a shortage of real resources in an LDC, little is left to be used by the people who are forced to save more. Moreover, deficit spending by the state on development projects leads to increased employment, output and income. The increased income

tends to raise the demand for consumer goods which leads to rise in prices due to deficient supplies. This process leads to inflation. In such a situation, a part of the increased income can be taken away through taxation by the government. It is another way of forced savings which can be utilised for capital formation.

However, "some price rise may well occur in an economy trying to increase its real capital and improve its technique of production. A moderate, though not continuous, rise of prices is likely to have beneficial effects on the process of development itself; it may, for instance, provide greater incentives to and sources of finance for greater private investment. The important point is to see whether a general and sustained price increase is taking place causing a perceptible and continuous depreciation in the value of money."[5]

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2. *Ibid.*, p. 107.

3. GOI, *The First Five Year Plan*, pp. 59-60.

4. This and the next section also relate to the problems of *Inflation* and *Economic Development.*

5. S.K. Ghosh, *Deficit Financing for Development and Inflationary Pressure*, p. 2.

The rationale of deficit financing is that it tends to raise the income of the *entrepreneurial* class which has a high propensity to save. During inflationary periods, wages and other fixed costs do not rise to the same extent as the rise in prices. This tends to raise profits which are used for higher investment and capital formation. At the same time, inflation tends to reduce the real income of the fixed incomists and thereby their propensity to save. But the loss in the propensity to save of the fixed incomists is compensated more than proportionately by the rise in the propensity to save of the variable incomists. "Given such differential marginal propensities to save, each inflation-induced redistribution of real income would increase the average propensity to save and the rate of growth of productive capacity for the whole economy."[6] Deficit financing thus combines in itself both the fiscal and monetary policies. It acts as a fiscal measure when inflation operates as an engine of forced saving through taxation. It is a monetary measure when it creates new money through a deficit budget.

Deficit financing is always *expansionary* in its effects. As development gains momentum, the rate of investment in the economy is accelerated which

requires additional doses of the quantity of money at every stage: (*a*) With a continuous increase in investment the total physical product is likely to be higher than before thereby necessitating a corresponding increase in supply of money for transaction purposes. *(b)* As the economy develops, the non-monetised sector is gradually transformed into the monetised sector, leading to an increase in the demand for money, (*c*) A process of continuous economic development leads to rise in income thus increasing the demand for cash balances on the part of the people. In the event of an import surplus due to increasing foreign aid, the demand for money is likely to be still greater. It is through deficit financing that the government can meet the increasing demand for money in all these cases. Thus a policy of deficit financing is an important and most fruitful instrument for capital formation in underdeveloped countries.

ITS ADVERSE EFFECTS

Deficit financing, as a tool of economic development is, however, not an unmixed blessing. It has its dangers. The dangers are inherent in its inflationary potential. When deficit financing merges into inflationary finance, it defeats its own purpose. A continuing rise in prices is a dangerous way of promoting economic development. Inflation is not only economically but also socially undesirable as a method of financing development, that is why, it is the most dreaded method of accelerating the rate of economic growth. When the government invests the newly created money on capital projects, incomes of the people engaged in these projects and related services increase and with that their high propensity to consume is further intensified. The existence of various market imperfections, of the little excess capacity in plant and equipment, and of low elasticities of food supplies stand in the way of increasing the supply of consumer goods in proportion to the expansion in money supply. All these factors tend to raise the prices of consumer goods and if they are not checked in time, they spread over the entire economy. Dr. Rao assigns four reasons as to why “the danger of the initial rise in prices taking on the character of inflation is greater in the case of deficit financing by government:

(*i*) Expansion of currency brings with it the possibility of a greater expansion of money supply through the expansion of credit;

(ii) Absence of direct return, i.e., absence of supplies of goods and services resulting from the outlay and saleable by government to the public, lessens the possibility of mopping up the additional income created by additional outlay;

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6. K. Kurihara, *op. cit.,* p. 150.

(iii) Absence of saleable securities against which the government outlay is undertaken, lessens the chances of mopping up additional income created by the additional outlay;

(*iv*) Great possibility of waste and failure to promote greater productivity associated with government investment in the absence of an exceptionally competent and honest standard of public administration leads to a failure of output to rise and compensate the additional purchasing power created by the additional outlay. Because of these reasons, deficit financing by government has always been looked upon as containing inflationary possibilities even when it is undertaken for development."[7]

LDCs are characterized by *market imperfections.* There is immobility of resources which leads to low elasticities of supplies. Such economies also lack large volume of fresh resources the demand for which is created by increased government spending. Moreover, resources being immobile create shortages in particular industries, sectors or regions. All these factors create more shortages in supplies in relation to a high demand, thereby leading to inflationary rise in prices.

When income increase as a result of deficit spending, they tend to increase the demand for *food products.* In underdeveloped countries the elasticity of demand for food being as high as 0.8, the expenditure on food increases more than proportionately to the rise in the income of the people. Since the supply of food does not increase much due to low-level of agricultural productivity, the prices of food articles rise and spread to the entire economy.

If the newly created money is used to finance quick-yielding projects which tend to increase output within a short period there is little price rise. Similarly, if it is used for producing consumer goods, deficit financing will not be inflationary as the supply of consumer goods will increase to match the

increased purchasing power in the hands of the people. On the contrary, the use of created money for financing long-term projects and for creating capital goods is bound to be inflationary, for such schemes require larger doses of investment and a longer gestation period. As such output lags behind the increased money supply. Lewis holds the view that "inflation for the purpose of capital formation is in due course self-destructive. It has three stages. Prices rise sharply in the first stage while the capital is being created. In the second stage, the inflation may peter out of its own accord because the rise in prices has redistributed income in such a way that voluntary savings are rapidly catching up with investment. Then in the third stage prices fall, as the additional output of consumer goods made possible by the capital formation begins to reach the market. It is only the first stage that is dangerous and painful."[8] Thus the period of inflation will be short because increased investment will lead to the production of additional goods and services and to increased incomes and savings which can then be taxed by the state. Lewis view that inflation for the purpose of capital formation is self-destroying is based on the Keynesian Multiplier Theory and the assumption of stable marginal propensity to save and consume. In other words, it depends on how far the people in the LDCs who receive the extra money income will continue to save and spend it in stable proportions in the face of the rising prices of consumer goods. According to Myint, it seems very difficult to believe that inflation will be self-destroying in the face of acute shortage of consumer goods, and of the tendency of the marginal propensity to consume to be near unity in LDCs.

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7. V.K.R.V. Rao, *op. cit.*, p. 115. In a recent study Dr. Rao observes, "A certain minimal rise in the price level is inevitable in any process of deliberately forcing the pace of development. The price rise becomes inflationary only when every rise in the price level becomes the base for a further rise in the price level and the process becomes not only self-sustaining but also self-accelerating." *Inflation and India's Economic Crisis.* 1973.

8. W.A. Lewis, *op. cit.*, p. 405.

It is argued that inflation affects the habit of *voluntary saving* adversely and that its ability to force savings is also limited. In the face of rising prices, it is not possible for the people to maintain the previous rate of saving. Not only this, the real income of the fixed incomists, will be reduced and they will save less or may even dissave. An inflationary rise in prices may even cause savings to be directed to profitable but unproductive forms of investment such as in real

estates, speculation, inventories, gold, jewellery, precious stones and foreign assets. Hence inflation promotes that type of investment which is inimical to economic growth and discourages investment in economic infrastructure.

Further, inflation by bringing about *uncertainty in future expectations* affects investment decisions adversely. Inflation, in its early stages, encourages entrepreneurial activity. When prices rise, costs do not rise in the same proportion, thus there are higher profits. But when in the face of continuously rising prices, strong trade unions press for wage increases, and strikes, slow-downs and general deterioration in labour efficiency create uncertainty in future business expectations, thereby investment is adversely affected. Again, a continuous rise in prices leads to rising costs, and spiral inflation gets going in the country. If at this stage an attempt is made to prevent prices from rising, costs remaining the same, profits would fall and with them investment too. Thus ultimately inflation becomes *self-defeating.*

Inflation, as a method of forced savings, gives rise to considerable social costs. Inflation, no doubt, helps to reduce consumption and increases savings, yet from the social view point, it is a wasteful method of forcing savings. The loss in real consumption of the masses tends to be greater than the gain in total savings of the community. Moreover, as a result of inflation some, sections of the community are made better off than others. There is a redistribution of income in favour of entrepreneurical class at the cost of the fixed incomists. This tends to increase disparities in income and wealth which may not lead to increased saving and investment. Entrepreneurs seldom invest in productive channels. They fritter away increased income on nonessential conspicuous consumption under the impact of the demonstration effect and thus decrease total private savings to the detriment of economic development. Higgins writes that "the destruction of the middle classes, impoverishment of workers and enrichment of speculators and blackmarketeers intensify social conflict and permit radical parties of right or left to take power. Underdeveloped countries prone to political instability cannot afford the added burden of hyperinflation."[9]

Inflation may retard economic development in another way. With the rise in the price level, the cost *of development projects* also rises resulting in larger doses of deficit financing on the part of the government. If not checked in earlier

stages, the rise in prices becomes cumulative. The vicious circle of more money chasing fewer goods develops which ultimately brings a total collapse of the monetary system.

Further, severe inflation also leads to *balance of payments* difficulties. Since the marginal propensity to import is high in underdeveloped countries, rise in domestic income and prices may encourage people to import more commodities from abroad. But increased imports cannot be matched by increased exports due to lack of diversification in the economy. Efforts to restrict imports may lead to greater rise in prices by bringing excessive pressure on domestic supplies. A high price level as compared to foreign countries will also make exports dearer and difficult. Moreover, inflation discourages the flow of foreign investment into the economy. Foreign investors are, in fact, scared away by a situation in which costs are constantly rising. All this implies a depletion of foreign exchange reserves which are important sources of developmental finance.

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9. B. Higgins, *op. cit.,* p. 464.

The sum up, "Inflation holds particular dangers for underdeveloped countries...Inflation encourages the specultative and unessential transactions which are major obstacle to economic development; discourages domestic savings as well as foreign investment; disrupts foreign trade relations, and lowers the general efficiency of productions."[10] Thus there is little positive relation between deficit financing and economic development.

SAFE LIMITS OF DEFICIT FINANCING

Deficit financing becomes inflationary only when it crosses the 'safe limit.' It is within the limits of safety so long as it is incurred in moderate doses, the rise in prices is creeping and appropriate measures are taken to keep the prices under check.

The question is, what is the 'safe limit' to deficit financing, and how to find it? In other words, what policy should be followed so that deficit financing leads to capital formation without inflationary rise in prices?

1. Growth Rate of Economy. The first factor which determines the 'safe limit' is the rate of growth of the economy. Deficit financing is non-inflationary to the extent of the growth rate of economy. For example, if the economy is growing at the rate of 6 per cent per annum and the supply of money in the economy is Rs. 2,000 crores, then it can absorb Rs. 120 crores annually without any adverse effects whatsoever. If, however, this amount is not injected into the economy, it will have a deflationary impact on it. Further, in a developing economy, a larger quantity of money than just the 'critically minimum' can be injected safely into the economy tor development purposes. For instance, a 7 per cent increase in money supply will not be inflationary. because development projects can absorb this much increase.

2. Growth of the Monetised Sector. To the extent the non-monetised sector is transformed into the monetised sector, the additional supply of money is not inflationary.

3. Increase in Loans and Taxes. Deficit financing is successful as an instrument of capital formation to the extent the deficit-induced additional income is mopped up in the form of loans and taxes. As Lewis observes, "If the government wishes the inflation to peter out as soon as possible, by maintaining its new higher levels of expenditure (in real terms), and if it cannot rely on the savers hoarding their savings, then it must get hold of the savings in some other way either by taxing them away or by offering favourable terms for government bonds."[11]

4. Control over Wages and Prices. The success of deficit financing also depends on the extent to which prices and wages are controlled in the economy. In order to prevent wages from rising, prices should be controlled and there should be a controlled distribution of consumer goods. The policy of 'credit-curb' and 'credit-regulation' should also be followed by the central bank.

5. Creation of Import Surplus. Deficit financing is non-inflationary to the extent the government is in a position to create import surplus. This can be done by the government buying foreign exchange from the Central bank against its cash balances to finance import of capital equipment, industrial raw materials and foodgrains, as is being done in India.

6. Increase in Supply of Goods. Deficit financing leads to inflation when

more money is chasing fewer goods. To the extent this gap between money-supply and supply of goods is bridged, deficit financing is non-inflationary. For this purpose, in the earlier stages of economic development, those projects should be promoted which have a short gestation period, and thus increase the supply of consumer goods quickly.

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10. UN, *Methods of Financing Economic Development in Underdeveloped Countries,* p. 20.

11. Op. cit., p. 233.

7. Increase in Equity Capital, Undistributed Profits and Budgetary Surpluses. Kurihara suggests that 'one should have concrete information or projections concerning the relative importance of debt and equity financing of external and internal financing, and of private and public savings. For inflation is known to react favourably on equity dividends, corporate and business profits and government tax revenues. In the overall scheme of developmental financing equity capital, undistributed profits and budgetary surpluses may play so preponderant a role as to render superfluous all apprehensions about the destructive effect of inflation on private saving."[12]

8. Spirit of Sacrifice. The safe limit to deficit financing depends upon the extent to which people appreciate and undertake sacrifices involved in deficit financing for economic growth. As Dr. Rao stresses, "I would like to emphasize the role of public understanding and public cooperation as a positive factor, in tending to diminish the price effect to deficit financing. In the popular view, deficit financing is associated with inflation. Not only is understanding required of deficit finance for capital formation but also public cooperation in the implementation of the policies for minimizing the price effect of deficit financing for capital formation."[13]

Conclusion. The use of deficit financing for economic development "may be likened to fire which if unregulated produces havoc, while regulated, it gives light and warmth. The danger is, therefore, not so much in the instrument itself as in the use to which it is put. Much depends on the degree of caution we exercise."[14]

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12. Op. *cit.,* p. 149

13. *Op. cit.*, p. 40.

14. K.N. Bhattacharya, *op. cit.*, p. 82.

CHAPTER

Price Policy in Economic Development

THE NATURE OF PRICE POLICY

Rise in prices is inherent in the development process. Imbalance between demand and supply of commodities and factors is inevitable under development planning. The demand for goods and services rises as a result of stepping up investments on a large scale and the consequent creation of money income. Ever mounting administrative, non-developmental and defence expenses and population pressures give a further pull to demand. But supply fails to meet the increased demand as investments in underdeveloped countries are made on such projects that take a long time to mature. Backward technology, low skills, market imperfections and various other bottlenecks, restrict the supply of consumer goods. The gap between demand and supply leads to rise in prices.

OBJECTIVES OF PRICE POLICY

Price policy is not merely concerned with holding the price line or keeping prices stable at any given level, but it is equally concerned with the movements

of general as well as relative prices of goods and services.

1. To Establish Equilibrium between Demand and Supply of Goods and Services. In considering the theory of price policy in the context of planned economic development, Dr. V.K.R.V. Rao[1] emphasises that *price* is an important economic mechanism performing certain functions, and any price policy should be in this functional context. Primarily, this function is to bring about the required equilibrium between demand and supply of goods and factors. When they perform their economic function, price movements should be of a self-liquidating character. It is not necessary that a rise in the comparative price levels of individual commodities should lead to a general price rise. Increase in individual prices liquidate themselves without bringing about a rise in the general price level when the former bring into use additional productive resources or raise the level of productive efficiency of existing resources. It means that in order to avoid a rise in the general levels of prices total output should be raised to meet the increased demand for individual commodities.

2. To Bring Flexibility in Prices. But in an underdevelopd country undergoing the process of economic development aggregate production takes much longer time to increase than in a developed one, as a result a rise in the general level of prices usually accompanies an increase in the prices of individual commodities. However, all price rises should not be regarded as socially undesirable. It is only when an individual or general price rise fails to increase output or to reduce demand that it is considered harmful. Thus price policy should aim at *flexibility* in prices in order to redirect demand, reallocate productive resources and reorientate output towards the desired direction.

3. To Stabilise Prices of Consumer Goods. It should also aim at *stabilizing* prices of basic consumption goods so as to avoid inflationary pressures arising from investment projects of long gestation in an underdeveloped country. But “a rigid, stable general level of prices may be as much of a dead weight on economic growth as a rapidly rising price level.”[2] A stable price level may retard growth whereas a rising price level may distort investment and income. The right and appropriate price policy in this context must achieve the objective of increasing the production both of basic consumption and investment goods.

4. Two Aspects of Price Policy. According to Prof. Rao[3] "a rightly conceived price policy for aiding economic development should, broadly, have both a macro and a micro aspect." In its *macro* aspect, it essentially takes the form of monetary and fiscal measures which are meant to influence the creation of income and its utilization. The Indian Third Plan Report also recognizes that a major constituent of price policy is monetary and fiscal discipline.[4] Monetary policy should prevent expenditure and consequent income creation going in the wrong direction. Speculative holding of commodities and accumulation are to be discouraged in particular. An appropriate interest rate and selective credit control policy may help in this direction. *Fiscal policy must go along with monetary policy.* The latter regulates the creation of excess purchasing power through banks and the former through government action. Both policies also help in maximizing savings of the community. But fiscal policy should in particular try to reduce income through appropriate tax measures. It should help in restraining consumption and mobilizing saving more effectively, and transfer real sources from the community for public investment programmes instead of creating fresh purchasing power. "In other words, macro policy with regard to prices operates not through a direct impact on individual prices but indirectly through its impact on income creation and income utilisation and, therefore, on the two variables that determine the monetary framework from all changes in prices."[5]

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1. V.K.R.V. Rao, *Essays in Economic Development,* Ch. 6.

2. Ibid, *op. cit.,* p. 146.

3. *Ibid.*

4. GOI, *Third Five Year Plan,* p. 127.

In its *micro* aspect, price policy is more direct and essential under development planning. It should aim at increasing the output of consumption goods alongwith investment goods in order to match increased consumption expenditure resulting from increase in investment outlay. Such a policy would encourage the use of resources for the production of investment and basic consumption goods and help avoid inflationary pressures. In other words, price mechanism should act both as a stimulant and a deterrant. Purposive and differential price policies should be followed for the production of specific

commodities and their utilization. This necessitates physical allocation and direct controls. In respect of basic consumption goods, like foodgrains, cloth, edible oil, etc., prices should be held reasonably stable through state trading and control at the retail and wholesale stage.

***5.*Agricultural Price Policy.** A suitable agriculture price policy holds the key to development in an underdeveloped economy. Agricultural prices are quickly responsive to demand and supply conditions. Since agricultural output constitutes 50 per cent or more of the national product, the general price level is mostly determined by the behaviour of agricultural prices. The agricultural price policy should aim at reducing price fluctuations of agricultural commodities so as to reduce the loss to the producer from a sharp price fall following the bumper cropland to minimize the difficulties of the consumers from sharp price rises as a result of crop failures or short supplies. For this, price policy should be comprehensive enough to include measures from the production of agricultural products to their distribution. In order to stimulate their production, various land reform measures should be adopted, dependence on nature be minimized, and inputs like fertilisers, improved seeds and implements be supplied at subsidised rates or even at short-term credit. But the important tenet of this price policy is the fixation of minimum and maximum prices for all major agricultural crops. The minimum prices should be so fixed as to provide proper incentives to producers after taking into account regional variations in the costs of production of different crops. It implies slight price variations for the same crop in different regions. The maximum prices reflect only a payment to the producer for the quality variations in the crops.[6] A successful price policy also includes the creation of buffer stocks and their operation through continuous purchase and sale over a wide range. Such purchase and sale operations should be undertaken by the state and its agencies. ‘A network of cooperative and governmental agencies close to the farmer, licensing and regulation of wholesale trade, extension of State trading in suitable directions and a considerable sharing by government and cooperatives in distribution arrangements at retail stage are essential for the success of purchase and sale operations for stabilizing prices and correcting seasonal and regional variations. Pursuit of these policies will be necessary if both the economic and psychological factors affecting the prices of essential consumer goods are to be brought under control.’

6. Price Policy for Consumer Goods. In the case of non-essential consumer goods, which fall in the category of comforts and luxuries, price determination should be left to market mechanism. If need be, price rise may be allowed but it should be accompanied by high taxes and controlled allocation of resources.

Another aspect of micro price policy is to raise the prices of the *exportable* commodities for the domestic consumer in order to supply them cheaper to the foreign consumer for the purpose of earning more foreign exchange. Fixation of the price of sugar in India is in keeping with this policy. It is not a healthy policy because it is like starving one's family in order to feed others.

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5. V.K.R.V. Rao *op. cit.,* p. 151.

6. NCAER, *Price Policy of Economic Growth,* 1965.

7. Price Policy for Industrial Raw Materials. Specific measures are also called forth for regulating the prices of industrial raw materials like coal, cement, iron and steel, etc. Just as stabilization of agricultural prices goes a long way in stabilizing the industrial prices, likewise stabilization of the prices of industrial raw materials contributes much towards stabilizing the prices of goods produced from them. Price policy should ensure their proper utilization and distribution so as to avoid inflationary pressures. Price rise should be permitted in their case keeping in view the need to promote exports to control domestic consumption or to provide incentives for further investment and production. Prices should be so fixed as to avoid excessive profit margin, at the same time providing incentives to production. Such a policy also necessitates the use of price and distribution controls in respect of such commodities.

8. Price Policy in Relation to Enterprises. In a mixed type of underdeveloped economy like ours both the public and private enterprises are expected to play an important role in the economic development. Public enterprises should follow such a price policy as that brings in larger profits commensurate with social welfare and thus help augment public savings. The private sector has to play a still more significant role in this context, since it predominantly supplies consumption goods. A rising price level would have a favourable effect on the expectations of the entrepreneurs. "To the extent the rising price level is able to transfer income from the passive rentier class to the active entrepreneurial

class, it will exercise a beneficial influence on the levels of savings, investment and output." But the price rise should be gradual and slow where there are competitive product and factor markets so as to affect a right allocation of investible resources among them. Price policy should, therefore, aim at bringing about a proper structure of production and distribution. An absolute and relative price behaviour should be established to promote economic development through rising levels of income, saving and investment.[7]

9. Relation between Price and Wage Policy. A rational price policy should aim at reducing the scope of automatic linkages between *price* and *wage* increase in the economy. Wage incomes and prices are interrelated. When prices rise, wage-earners struggle for inceased wages. When wages rise, they tend to push up prices in the absence of a matching supply of essential consumer goods. A wage-freeze policy is no remedy since it adversely affects efficiency and productivity. It is, therefore, better to have a wage policy in the interest of orderly development. "A steady and calculated wage increase is better than an abrupt jump with every price change."[8] Wages should rise in those sectors where the prevailing average wage is below the minimum consumption level. Wage increase should, however, be related to productivity. But even the productivity-oriented wage policy cannot stabilize wages and hence prices, unless continuous supplies of essential consumer goods are forthcoming at reasonable prices. Thus price policy should ensure the avoidance of a spiralling of costs, prices and wages through their mutual interaction.

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7. *Ibid.*

8. *Ibid.*

CHAPTER

Population Growth and Economic Development

INTRODUCTION

The consequences of population growth on economic development have attracted the attention of economists ever since Adam Smith wrote his *Wealth of Nations*. Adam Smith wrote, "The annual labour of every nation is the fund which originally supply it with all the necessaries and conveniences of life." It was only Malthus and Ricardo who created an alarm about the effects of population growth on the economy. But their fears have proved unfounded because the growth of population in Western Europe has led to its rapid industrialization. Population growth has helped the growth of such economies because they are wealthy, have abundant capital and scarcity of labour. In such countries, the supply curve of labour is elastic to the industrial sector so that even a high growth rate of population has led to a rapid increase in productivity. In fact, every increase in population has led to a more than proportionate increase in the gross national product.

EFFECTS OF POPULATION GROWTH ON ECONOMIC DEVELOPMENT

Population growth affects economic development in two ways : *First*, by promoting economic development and *second,* by retarding economic development. We discuss these divergent views as under :

A. FACTORS PROMOTING ECONOMIC DEVELOPMENT

Kuznets, Lewis, Meier and other economists have shown that the growth of population has been an important factor in the economic growth of developed countries in the following ways:

(a) Increase in Per Capita Product. Prof. **Kuznets** in his study *Modern Economic Growth* has pointed out that substantial rates of population growth in Europe have led to high rates of increase in total product and per capita product. The growth of total product and per capita product has been accompanied by growth of national product. The growth of national product, in turn, has been due to the enormous addition to population which has led to large increase in working labour force. Kuznets points out that, "in modern times growth in population has been accompanied by growth in aggregate output for many countries so large that there was also a marked secular rise in per capita product."

(b) Rise in Labour Productivity. The rise in the rate of per capita product is the result of rise in labour productivity. It is improvement in the quality of labour which increases productivity per unit of labour.

This means a rise in the efficiency of labour which leads to greater output per unit of labour. Studies made by **Schultz, Harbison, Kendrick, Solow** and a host of other economists reveal that one of the important factors responsible for the rapid growth of American economy has been the increase in labour productivity. According to Prof. J.K. **Galbraith,** a large part of America's industrial growth has been from improvements brought about by improved men.

(c) Population Growth leads to Growth of Physical Capital. It has been proved by recent researches that the growth of physical capital stock depends to a considerable extent on human capital formation which is the "process of increasing knowledge, the skills and the capacities of all people of the country." The spread of education, knowledge and know-how raise the level of

skills and physical efficiency of the people and thus increase the productivity of physical capital. The latter, in turn, raises the national product.

(d) Population Growth leads to Age of High Mass-Consumption. Rostow has shown in his *Stages of Economic Growth* that during the "take-off stage" when the growth rate of population was high, the rate of net investment rose by 5-10 per cent of national income. This led to the development of "leading sectors" due to increase in the effective demand for their products. This paved the way for the Age of High Mass-Consumption through which almost all developed countries are passing. Thus population growth leads to increase in the production of goods and ultimately to the extensive use (consumption) of automobiles, durable consumers' goods and household gadgets.

(e) Population Growth as a Source of Capital Formation. According to **Nurkse**[1] and **Lewis**[2]**,** high population growth can be a source of capital formation in under developed countries. Nurkse points out that under developd countries suffer from disguised unemployment on a mass scale. This surplus labour force can be put to work on capital projects like irrigation, drainage, roads, railways, houses, etc. They can be supplied simple spare tools by farmers and food by their families. In this way, surplus rural labour force can be a source of capital formation. On the other hand, Prof. Lewis suggests that economic development takes place when capital accumulates with the withdrawal of surplus labour from the rural sector and its employment in the industrial sector. Such workers are paid the subsistence wage rate which is less than the prevailing market wage rate. This leads to profits which are invested by capitalists for capital formation.

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1. R. Nurkse, *Problems of Capital Formation in Underdeveloped Countries, 1951.*

2. W. A. Lewis "Economic Development with Unlimited Supplies of Labour, *"Manchester School,"* May 1954.

B. FACTORS RETARDING ECONOMIC DEVELOPMENT

The consequences of population growth on the development of underdeveloped countries (UDCs) are not the same because the conditions prevailing in these countries are quite different from those of the developed

economies. These economies are poor, capital-scarce and labour-abundant. Population growth adversely affects their economic development in the following ways:

Investment. Faster population growth makes the choice more scarce between higher consumption now and the investment needed to bring higher consumption in future. Economic development depends upon investment. In UDCs the resources available for investment are limited. Therefore, rapid population growth retards investment needed for higher future consumption.

Overuse of Resources. Rapid population growth tends to overuse the country's natural resources. This is particularly the case where the majority of people are dependent on agriculture for their livelihood. With rapidly rising population, agricultural holdings become smaller and unremunerative to cultivate. There is no possibility of increasing farm production through the use of new land (extensive cultivation). Consequently, many households continue to live in poverty. In fact, rapid population growth leads to the overuse of land, thereby endangering the welfare of future generations. Even in countries where natural resources are untapped such as Brazil and other Latin American countries, rapidly increasing population makes it difficult to invest in roads, public services, drainage and other agricultural infrastructure needed to tap such resources.

Urbanisation. With rapidly growing population, it becomes difficult to manage the adjustments that accompany economic and social change. Urbanisation in UDCs creates such problems as housing, power, water, transport, etc. Besides, growing population threatens permanent environmental damage through urbanisation in some rural areas.

Per Capita Income. The effect of population growth on per capita income is unfavourable. The growth of population tends to retard the per capita income in *three* ways : *(i)* It increases the pressure of population on land; *(ii)* it leads to rise in costs of consumption goods because of the scarcity of the cooperant factors to increase their supplies; and *(iii)* it leads to a decline in the accumulation of capital because with increase in family members, expenses increase. These adverse effects of population growth on per capita income operate more severely if the percentage of children in the total population is High, as is actually the case in all UDCs. Children involve economic costs in

the form of time and money spent in bringing them up. But they are also a form of investment if they work during childhood as is the case with the majority of families, and if they support parents in old age which is rare in the case of majority of children. As these economic gains from having many children are uncertain, therefore, a large number of children in the population entails a heavy burden on the economy, because these children simply consume and do not add to the national product. Another factor is the low expectancy of life in under developed countries. It means that there are more children to support and few adults to earn thereby bringing down the per capita income. Whatever increase in national income takes place that is nullified by increase in population. Thus the effect of population growth is to lower the per capita income.

Standard of Living. Since one of the important determinants of the standard of living is the per capita income, the factors affecting per capita income in relation to population growth equally apply to the standard of living. A rapidly increasing population leads to an increased demand for food products, clothes, houses, etc. But their supplies cannot be increased in the short run due to lack of cooperant factors like raw materials, skilled labour, capital, etc. Consequently, their costs and prices rise which raise the cost of living of the masses. This brings down further the already low standard of living. Poverty breeds large number of children which increases poverty further, and the vicious circle of poverty, more children and low standard of living continues. But **Hirschman** and **Colin Clark** opine that population pressures leading to lowering of standards will encourage the people of UDCs to work hard in order to improve their standard of living.

Agricultural Development. In UDCs, people mostly live in rural areas, Agriculture is their main occupation. So with population growth the land-man ratio is disturbed. Pressure of population on land increases because the supply of land is inelastic. It adds to disguised unemployment and reduces per capita productivity further. As the number of landless workers increases, their wages fall. Thus low per capita productivity reduces the propensity to save and invest. As a result, the use of improved techniques and other improvements on land are not possible. Capital formation in agriculture suffers and the economy is bogged down to the subsistence level. The problem of feeding the additional population becomes serious due to acute shortage of food products. These

have to be imported which increases the balance of payments difficulties. Thus, the growth of population retards agricultural development and creates a number of other problems discussed above.

Employment. A rapidly increasing population plunges the economy into mass unemployment and under-employment. As population increases, the proportion of workers to total population rises. But in the absence of complementary resources, it is not possible to expand jobs. The result is that with the increase in labour force, unemployment and under-employment increases. A rapidly increasing population reduces incomes, savings and investment. Thus capital formation is retarded and job opportunities are reduced, thereby increasing unemployment. Moreover, as the labour force increases in relation to land, capital and other resources, complementary factors available per worker decline. As a result, unemployment and under-employment increase. UDCs have a backlog of unemployment which keeps on growing with the rapidly increasing population. This tends to raise the level of unemployment manifold as compared with the actual increase in labour force.

Social Infrastructure. Rapidly growing population necessitates large investments in social infrastructure and diverts resources from directly productive assets. Due to scarcity of resources, it is not possible to provide educational, health, medical, transport and housing facilities to the entire population. There is over-crowding everywhere. As a result, the quality of these services goes down. To provide these social infrastructure requires huge investment.

Labour Force. The labour force in an economy is the ratio of working population to total population. Assuming 50 years as the average life-expectancy in an under-developed country, the labour force is in effect the number of people in the age-group of 15-50 years. During the demographic transitional phase, the birth rate is high and the death rate is on the decline. The result is that a larger percentage of the total population is in the lower age-group of 1-15 years.

It means that addition to the lower age-group is larger than the working age-group. A large percentage of children in the labour force is a heavy burden on the economy. It also implies that the labour force tends to increase with the increase in population. It will grow even faster, if more women seek paid

employment. Since it is not possible to increase capital per worker *(i.e.*, capital deepening) with growing labour force, each worker will produce less than before. This will reduce productivity and income. Wages will fall in relation to profits and rents thereby increasing income inequalities. Besides, rapid growth in the labour force increases both open unemployment and under-employment in urban and rural areas.

Capital Formation. Population growth retards capital formation. As population increases, per capita available income declines. People are required to feed more children with the same income. It means more expenditure on consumption and a further fall in the already low savings and consequently in the level of investment. Further, a rapidly growing population by lowering income, savings and investment compels the people to use a low level technology which further retards capital formation.

Environment. Rapid population growth leads to environmental damage. Scarcity of land due to rapidly increasing population pushes large number of people to ecologically sensitive areas such as hillsides and tropical forests. It leads to overgrazing and cutting of forests for cultivation leading to severe environmental damage. Moreover, the pressure of rapid growth of population forces people to obtain more food for themselves and their livestock. As a result, they over-cultivate the semi-arid areas. This leads to desertification over the long run when land stops yielding anything. Besides, rapid population growth leads to the migration of large numbers to urban areas with industrialization. This results in severe air, water and noise pollution in cities and towns.

World Economy. Rapid population growth also affects UDCs in relation to the world economy in a number of ways.

First, rapid population growth tends to increase income disparities between UDCs and developed countries because the per capita incomes decline with growth in numbers in the former.

Second, rapid population growth encourages international migration. But these are limited only to the Middle East countries where there is a dearth of skilled and unskilled labour. But the developed countries place restrictions on immigration because labour from poor countries adversely affects the wages

of native workers and also creates social and political tension.

Third, emigration tends to increase wages of workers substantially at home.

Fourth, another beneficial effect of this is that emigrants remit large sums of money back home. This increases family income and their living standards at home. Such families spend more on food, clothing and on modern household gadgets. Thus they lead more comfortable lives. Some repay family debts, while others invest in agricultural land and urban real estate. On their return, some enterprising persons start new ventures and others expand family-owned commercial and manufacturing businesses. Further, remittances by emigrants help finance the countries balance of payments deficit. UDCs are great losers because of the 'brain drain' when professional and technical workers emigrate to other countries. They subsidise the educational costs of such personnel but are unable to tax their income. The money they remit is insignificant as compared with the above two types of losses. Often the best of the brains are allowed to settle permanently in the employing country which is a permanent loss to the home country.

Lastly, with rapid population growth the domestic consumption of even exportable goods increases. Consequently, there is a decline in the exportable surplus. On the other hand, to meet the demand of rapidly increasing population, more food and other consumer goods are required. It leads to an increase in imports of such goods alongwith those of capital goods needed for the development. Reduction in exports and increase in imports lead to *deterioration in the balance of payments position* of the country. This may force the state to curtail the importation of capital goods which will adversely affect economic development of the country.

Conclusion. The consequences of a rapidly increasing population are to retard all development efforts in an under developed country unless accompanied by high rates of capital accumulation, and technological progress. But these counteracting factors are not available and the result is that *population explosion* leads to declining agricultural productivity, low per capita income, low living standards, mass unemployment, low rate of capital formation, and adverse balance of payments.

THE THEORY OF DEMOGRAPHIC TRANSITION

The theory of demographic transition or of population stages or of population cycle has many versions. It has been propounded by W.S. Thomson and F.W. Notestein. They explain the theory in three stages. But the two famous versions are C.P. Blacker's *five stages of population growth* which have been explaind here, and Karl Sax's *four stages of population growth*, namely, High Stationary, Early Explosive Increase, Late Explosive Increase, and Low Stationary. He does not explain Blacker's Declining Stage, while his four stages almost resemble Blacker's other stages.

The theory of Demographic Transition explains the effects of changes in birth rate and death rate on the growth rate of population. According to **E.G. Dolan,** "Demographic transition refers to a population cycle that begins with a fall in the death rate, continues with a phase of rapid population growth and concludes with a decline in the birth rate."

The theory of demographic transition is based on the actual popluation trends of advanced countries of the world. This theory states that every country passes through different stages of population development. According to **C.P. Blacker**, they are : *(i)* the high stationary phase marked by high fertility and mortality rates; *(ii)* the early expanding phase marked by high fertility and high but declining mortality; *(iii)* the late expanding phase with declining fertility but with mortality declining more rapidly; *(iv)* the low stationary phase with low fertility balanced by equally low mortality; and *(v)* the declining phase with low mortality, lower fertility and an excess of deaths over births. These stages are explained in the Fig. 1 (A) & (B). In the figure, the time for different stages is taken on the horizontal axis and annual birth and death rates on the vertical axis. The curves *BR* and *DR* relate to birth rate and death rate respectively. *P* is the population curve in the lower portion of the figure.

First Stage. In this stage the country is backward and is characterised by high birth and death rates with the result that the growth rate of population is low. People mostly live in rural areas and their main occupation is agriculture which is in a state of backwardness. There are a few simple, light and small consumer goods industries. The tertiary sector consisting of transport, commerce, banking and insurance is underdeveloped. All these factors are responsible for low incomes and poverty of the masses. Large family is regarded as a necessity to augment the low family income. Children are an asset to the society and parents. The existence of the joint family system

provides employment to all children in keeping with their ages. More children in a family are also regarded as an insurance against old age by the parents. People being illiterate, ignorant, superstitious and fatalists are averse to any method of birth control. Children are regarded as God-given and pre-ordained. All these economic and social factors are responsible for a high birth rate in the country. Alongwith high birth rate the death rate is also high due to non-nutritional food with a low caloric value, lack of medical facilities and the lack of any sense of cleanliness. People live in dirty and unhealthy surroundings in ill-ventilated small houses. As a result, they are disease-ridden and the absence of proper medical care results in large deaths. The mortality rate is the highest among the children and the next among women of child-bearing age. Thus the birth rates and death rates remain approximately equal over time so that a static equilibrium with zero population growth prevails. According to Blacker, this stage continued in Western Europe approximately upto 1840 and in India and China till 1900. This is illustrated in Fig. 1 (A) by the time period HS-' *High Stationary"* stage and by the horizontal portion of the *P* (poulation) curve in the lower portion of the figure.

Second Stage. In the second stage, the economy enters the phase of economic growth. Agricultural and industrial productivity increases, and means of transport develop. There is greater mobility of labour. Education expands. Income increase. People get more and better quality food products, medical and health facilities are expanded.

Modern drugs are used by the people. All these factors bring down the death rate. But the birth rate is almost stable. People do not have any inclination to reduce the birth of children because with economic growth employment opportunities increase and children are able to add more to the family income. With improvement in the standard of living and the dietary habits of the people, the life expectancy also increases. People do not make any effort to control the size of family because of the presence of religious dogmas and social taboos towards family planning. Of all the factors in economic growth it is difficult to break with the past social institutions, customs and beliefs. As a result of these factors, the birth rate remains at the previous high level. With decline in the death rate and no change in the birth rate, population increases at a rapid rate. This leads to *Population Explosion.* This is an *"Early Expanding"* (EE) stage in population development when the population growth curve is rising from A

to B as shown in Fig. 1(B), with decline in death rate and no change in birth rate, as shown in the upper portion of the figure. According to Blacker, 40% of the world population was in this stage upto 1930. Many countries of Africa are still in this stage.

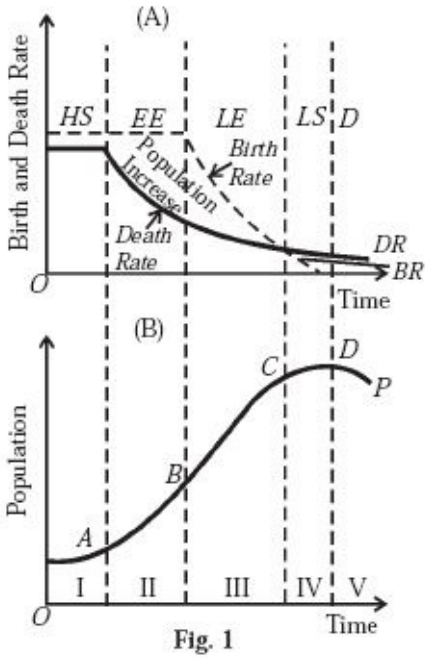

Fig. 1

Third Stage. In this stage, birth rate starts declining accompanied by death rates declining rapidly. With better medical facilities, the survival rate of children increases. People are not willing to support large families. The country is burdened with the growing population. People adopt the use of contraceptives so as to limit families. Birth rate declines initially in urban areas, according to Notestein. With death rate declining rapidly, the population grows at a diminishing rate. This is the *"Late Expanding"* stage as shown by *LE* in Fig. (A) and *BC* in Fig. (B). According to Blacker, 20% of the world population was in this stage in 1930.

Fourth Stage. In this stage, the fertility rate declines and tends to equal the death rate so that the growth rate of population is stationary. As growth gains momentum and people's level of income increases, their standard of living rises. The leading growth sectors expand and lead to an expansion in output in other sectors through technical transformation. Education expands and permeates the entire society. People discard old customs, dogmas and beliefs, develop individualistic spirit and break with the joint family. Men and women prefer to marry late. People readily adopt family planning devices. They prefer to go in for a baby car rather than a baby. Moreover, increased specialisation following rising income levels and the consequent social and economic mobility make it costly and inconvenient to rear a large number of children. All this tends of reduce the birth rate further which alongwith an already low death rate brings a decline in the growth rate of population. The advanced countries of the world are passing through this *"Lower Stationary"* (LS) stage of population development, as shown in Fig. (A) and *CD* in Fig. (B). Population growth is curtailed and there is zero populaton growth.

Fifth Stage. In this stage, death rate exceeds birth rate and the population

growth declines. This is shown as *D* in Fig. (A) and the portion *DP* in Fig. (B). A continuing decline in birth rate when it is not possible to lower death rate further in the advanced countries leads to a "declining" stage of population. The existence of this stage in any developed country is a matter of speculation, according to Blacker. However, France appears to approach this stage.

Conclusion. The theory of demographic transition is the most acceptable theory of population growth. It does not lay emphasis on food supply like the Malthusian theory, nor does it develop a pessimistic outlook towards population growth. It is also superior to the optimum theory which lays an exclusive emphasis on the increase in per capita income for the growth of population and neglects other factors which influence it. The biological theories are also one-sided because they study the problem of population growth simply from the biological angle. Thus the demographic transition theory is superior to all the theories of population because it is based on the actual population growth trends of the developed countries of Europe. Almost all the European countries have passed through the first three stages of this theory and are now in the fourth stage.

ITS CRITICISMS

Despite its usefulness as a theory describing demographic transition in Western countries, it has been criticised on the following grounds:

Sequences of Stages not Uniform. Critics point out that the sequences of the demographic stages have not been uniform. For instance, in some East and South European countries, and in Spain in particular, the fertility rate declined even when mortality rate were high. But in America, the growth rate of population was higher than in the second and third stage of demographic transition.

Birth Rate not declined Initially in Urban Areas. Nolestein's assertion that the birth rate declined initially among urban population in Europe has not been supported by empirical evidence. Countries like Sweden and France, with predominantly rural population experienced decline in birth rate to the same extent as countries like Great Britain with predominantly urban population.

Explanations of Birth Rate decline Vary. The theory fails to give the

fundamental explanation of decline in birth rate in Western countries. In fact, the causes of decline in birth rate are so diverse that they differ from country to country.

Thus the theory of demographic transition is a generalisation and not a theory.

Not only this, this theory is equally applicable to the developing countries of the world. Very backward countries in some of the African states are still in the first stage, whereas the other developing countries are either in the second or in the third stage. India has entered the third stage where the death rate is declining faster than the birth rate due to better medical facilities and family welfare measures of the government. But the birth rate is declining very slowly with the result that the country is experiencing *population explosion.* It is on the basis of this theory that economists have developed economic-demographic models so that developing countries should enter the fourth stage. One such model is the *Coale-Hoover model* for India which has also been extended to other developing countries. Thus this theory has universal applicability, despite the fact that it has been propounded on the basis of the experienoes of the European countries.

CHAPTER

Human Capital Formation and Manpower

MEANING AND IMPORTANCE OF HUMAN CAPITAL FORMATION *

The term human capital formation refers to the "process of acquiring and increasing the number of persons who have the skills, education and experience which are critical for the economic and the political development of a country. Human capital formation is thus associated with investment in man and his development as a creative and productive resource."[1] According to Schultz, there are five ways of developing human resources: "

(*i*) health facilities and services, broadly conceived to include all expenditures that affect the life expectancy strength and stamina, and the vigour and vitality of the people;

(*ii*) on-the-job training, including old type apprenticeships organised *by* firms;

(*iii*) formally organised education at the elementary, secondary and higher levels;

(iv) study programmes for adults that are not organised by firms, including extension programmes notably in agriculture;

(*v*) migration of individuals and families to adust to changing job opportunities."[2] To this list may be added the import of technical assistance, expertise and consultants. In its wider sense, investment in human capital means expenditure on health, education and social services in general; and in its narrower sense, it implies expenditure on education and training. It has become conventional to talk about investment in human resources in its narrower sense because expenditure on education and training is capable of measurement as compared to the expenditure on social services.

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* This also relates to *Human-Resource Development.*

1. F.H. Harbison, 'Human Resources in Development Planning in Modernising Economies,' *ILR., May* 1962.

2. T.W. Schultz, 'Investment in Human Capital,' *AER*, March, 1961.

The notion of investment in human capital is of recent origin. In the process of economic growth, it is customary to attach more importance to the accumulation of physical capital. Now it is increasingly recognised that the growth of tangible capital stock depends to a considerable extent on human capital formation which is the "process of increasing knowledge, the skills and the capacities of all people of the country."[3] Studies made by **Schultz, Harbison, Denison, Kendrick, Abramovitz, Becker, Bowman, Kuznets** and a host of other economists reveal that one of the important factors responsible for the rapid growth of the American economy has been the relatively increasing outlays on education. They tell us that a dollar invested on education brings a greater increase in national income than a dollar spent on dams, roads, factories or other tangible capital goods. In **Prof. Galbraith's** words, "We now get the larger part of our industrial growth not from more capital investment but from investment in men and improvements brought about by improved men." Even earlier economists like Adam Smith, Veblen and Marshall stressed the importance of human capital in production. Adam Smith included in a country's stock of fixed capital 'the acquired and useful abilities of all the inhabitants.' To Veblen technological knowledge and skills formed the community's 'immaterial equipment or intangible assets' without which

physical capital could not be utilized productively. Marshall regarded education “as a national investment “and” the most valuable of all capital is that invested in human beings.” Economists are, therefore, of the view that it is the lack of investment in human capital that has been responsible for the slow growth of the LDCs. Unless such economies spread education, knowledge, and know-how, and raise the level of skills and physical efficiency of the people, the productivity of physical capital is reduced.

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3. F.H. Harbison and C. A. Meyers, *Education, Manpower and Economic Growth,* 1964

Underdeveloped countries are faced with two diverse manpower problems. They lack the critical skills needed for the industrial sector and have a surplus labour force. The existence of surplus labour is to a considerable extent due to the shortage of critical skills. So these diverse problems are interrelated. Human capital formation aims at solving these problems by creating the necessary skills in man as a productive resource and providing him gainful employment.

The need for investment in human capital formation in such economies is more obvious from the fact that despite the massive import of physical capital they have not been able to accelerate their growth rates because of the existence of undeveloped human resources. Of course, some growth is possible from the increase in the conventional capital even though the available labour force is lacking in skills and knowledge. But the growth rate will be seriously limited without the latter. Human capital is, therefore, “needed to staff new and expanding government services, to introduce new system of land use and new methods of agriculture, to develop new means of communication, to carry forward industrialization, and to build the educational system. In other words, innovation or the process of change from static or traditional society, requires very large doses of strategic human capital.”

Physical capital becomes more productive if the country possesses sufficient human capital. Underdeveloped countries are strongly committed to the programmes of constructing roads, dams, power houses, factories pertaining to light and heavy industries, hospitals, schools, colleges, and a host of other activities associated with development planning. For this, they need engineers, technicians, technical supervisors, managerial and administrative personnel,

scientists, doctors, nurses, veterinarians, agronomists, accountants, statisticians, economists, secretaries, stenographers, etc. If there is a dearth of this varied type of human capital, physical capital cannot be productively utilized. As a result, machines breakdown and wear out soon, materials and components are wasted and the quality of production falls.

Moreover, underdeveloped countries import physical capital for development but they are unable to utilise it fully due to the lack of the "critical skills" required for its operation. Though technical know-how and skills usually come with foreign capital, yet it is insufficient to meet the diverse and varied requirements of such economies. Thus the failure of human capital to grow at the rate of physical capital has been responsible for the low absorptive capacity of the latter in underdeveloped countries. Hence the need for investment in human capital becomes of paramount importance in such countries.

LDCs are characterized by economic backwardness which manifests itself in "low labour efficiency, factor immobility, limited specialisation in occupations and in trade, a deficient supply of enterpreneurship and customary values and traditional social institutions that minimise the incentives for economic change. The slow growth in knowledge is an especially severe restraint on progress. The economic quality of the population remains low when there is little knowledge of what natural resources are available, the alternative production techniques that are possible, the necessary skills, the existing market conditions and opportunities, and the institutions that might be created to favour economising effort and economic rationality." To remove economic backwardness and instill the capacities and motivations to progress, it is necessary to increase the knowledge and skills of the people. In fact, without an improvement in the quality of human factor no progress is possible in an underdeveloped country. As aptly emphasized by Schultz, "It is as if we had a map of resources which did not include a mighty river and its tributaries. The particular river is fed by schooling, learning on-the-job, advances in health, and the growing stock of information of the economy."

Investment in human capital is also required to raise the general living standards of the people in LDCs. This is possible when education and training make fuller and rational utilisation of surplus manpower by providing larger and better job opportunities in both rural and urban areas. These, in turn, raise income and living standards of the people.

PROBLEMS OF HUMAN CAPITAL FORMATION

The concept of human capital formation in the context of investment in education poses a number of problems. How much is the total stock of human capital required? At what stage of development is it needed the most? What should be its rate of accumulation? What type of education should be imparted, to what extent, and at what time? And how should the return from educational investment be measured?

It is difficult to assess the *total stock* of human capital required in an underdeveloped country. In fact, this problem is associated with the next one, of determining the *stage* when it is needed the most. The growth of western European countries and the USA has been based more on investment in physical capital than in human capital in their earlier phases of development. But in the case of underdeveloped countries the need for human capital in the form of educated persons in different vocations is greater to provide the missing components in the initial stages of their development. As they install complex equipment and methods of production, persons with critical skills are more important than mere arts graduates. There is greater need for entrepreneurs, business executives, administrators, scientists, engineers, doctors, etc. But it is difficult to increase their supply because "their basic function is to change the economic organisation of the country in more productive directions instead of being fitted into a given framework."

4.T.W. Schult, 'Reflection on Investment in Man', *JPE*, October, 1962.

It is not possible to spell out in concrete terms the *growth rate* of human capital formation, as is commonly the case with physical capital accumulation. However, it can be said in general terms that the rate of accumulation of human capital should exceed not only the growth rate of labour force but also the growth rate of economy. According to Harbison, in most countries the rate of increase in scientific and engineering personnel should be at least *three* times that of the labour force, and atleast *twice* in the case of clerical personnel, craftsmen, top managerial and administrative personnel. On the other hand, the ratio of the annual increase in human capital to the annual increase in the national income may be as high as three to one, or even higher in the case of

those countries where foreigners are to be replaced by citizens of the developing countries. But there is no empirical evidence to prove the different growth rates of human capital needed by underdeveloped countries at the various stages of development.

So far as the *pattern* of investment in education is concerned, almost all the under developed countries of Asia, Africa and Latin America accord a high priority to primary education which is often free and compulsory. But it leads to considerable wastage and stagnation and puts a severe strain on the physical facilities and teaching personnel of educational institutions. Secondary education is, on the other hand. accorded a low priority. It is, however, people with secondary education who provide the critical skills needed the most for economic development. Emphasizing the importance of secondary education, Lewis regards persons with a secondary education as "the officers and non-commissioned officers of an economic and a social system. A small percentage goes on to university education, but the numbers required from the university are so small that the average country of upto five million inhabitants could manage tolerably well without a university of its own. The middle and upper ranks of business consist almost entirely of secondary school products, and these products are also the backbone of public administration.[5] But LDCs lay more emphasis in providing primary education on a mass scale.

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5. W.A. Lewis, 'Education and Economic Development,' *ISCJ,* Vol. XIV. No. 4, 1962.

Underdeveloped countries in their enthusiasm to spread higher education have been *opening* too many *universities* without trying to improve the standard of education. No restrictions are placed on higher education with the result that the proportion of failures at the higher secondary and university levels is very high. Mass failures and the general lowering of academic standards tend to lower the efficiency of undergraduates and "graduates employed both in the private and the public sector do not promise well for the formation of a dynamic leadership for economic development." This leads to wastage of human resources.

Moreover, there being little manpower planning in such economies, no efforts are made to match the demand and supply of different types of critical skills. As a result, "few countries can go on absorbing poorly trained university

graduates at a faster rate than their general economic growth. Sooner or later with their present pattern of educational expansion, many developing countries will have to contend with one of the most explosive problems of discontent and frustration, that of graduate unemployment." Considering the high cost of education, the educated unemployed are a huge waste of human and material resources. Besides the defective educational system, other factors responsible for this are the lack of employment bureaux, low wage and salary structure, unwillingness to accept a job in rural areas or one considered below the occupational hierarchy or status, and dropouts.

Further, insufficient attention is paid to agricultural education, adut, education and on-the-job training programmes in such countries. There are no on-the-job training programmes. Little is done in the field of adult education and in educating the farmers to use modern agricultural practices. Adult education helps in changing the outlook of the farmers, sharpens their decision-making skills and provides them necessary information with regard to modern agricultural practices. But these educational and training programmes require a large number of teachers and instructors which the LDCs woefully lack.

Another problem of investment in human capital is that politicians and administrators consider it more in terms of providing buildings and equipment than the teaching staff. In fact, the real bottleneck to the formation of human capital in LDCs is the supply of qualified instructors and teachers.

CRITERIA FOR INVESTMENT IN HUMAN CAPITAL

One of the most ticklish problem is that of estimating the productivity of investment in human capital formation, especially in education. Economists have suggested the following criteria.[6]

1. The Rate of Return Criterion. Education as an investment has two components: future consumption component and future earnings component. Investment in skills and knowledge increases future, earnings, while the satisfaction derived from education is the consumption component. "As an enduring consumer component, *education* is the source of future utilities which in no way enters into measured national income."[7] Thus in calculating the return on investment in education, future earnings component is considered

discounted for interest to measure their present value. The method used is based on a comparison of the average life time earnings of more educated persons with that of persons with less education employed in similar professions. For example, **Becker** estimated that the rate of return on total investment on college education in the USA for white urban males was 12.5 per cent in 1940 and 10 per cent in 1950. It was, however, 9 per cent after deducting taxes for both 1940 and 1950.[8] This estimate included direct cost to the student, earnings forgone during the period of studies, and college's share of the cost.

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6. We have not discussed the Cost-Benefit Criterion. For this, refer to the chapter on Project Evaluation. Prof. G.M. Meier observes in this connection: "Any cost-benefit analysis of the "returns" to education must incorporate the interactions between education and the economy giving particular attention to education as an investment, the importance of rural education in a developing economy, and the interdependence between education, manpower requirements and development." *(Leading Issues in Economic Development*, 1976).

7. T.W. Schultz. op. *cit.*

8. G.S. Becker, 'Under Investment in College Education, *AER,'* May 1960.

Its Difficulties. Such estimates involve several difficulties.

First, they measure only the direct material benefit and exclude altogether the external economies of education—the direct and indirect benefits accruing to the country from improvements in the levels of the people.

Second, this criterion is based on a number of arbitrary assumptions such as the person's income during his life time, the earnings from different occupations, future wage rates and future employment, levels.

Third, the decisions to invest in education and training are not governed by the rate of return criterion alone but by social welfare.

Fourth, what people earn is not exclusively due to university education, rather it is the result of natural ability, experience, social status, family connection, on-the-job training, etc.

Fifth, such estimates measure only private rates of return, on investment in education. They indirectly measure the effects of education on the output of the

country by assuming that differences in earnings reflect differences in productivity. But collective efforts by various groups (such as doctors, manual workers, teachers, and engineers through trade unions) and other factors may distort relative earnings in the economy. Moreover, private rates of return cannot be evaluated where the costs of running the school are negligible as is the case of a single teacher school being run without any fee in many Indian villages

Sixth, returns from investment in creating skills and knowledge do not increase incomes of the individuals concerned but the total productive capacity of the economy.

Seventh, according to Eckaus, prices of educated labour used in the estimation of rate of return must reflect the relative scarcities of factors involved. But where the major part of investment costs on education are borne by the government, prices of educated labour do not reflect scarcities of factor inputs determined in competitive markets. Moreover, this criterion fails to provide information on "how much" and "what kind" of additional education is required for economic development.[9]

Last, as observed by Bowen, the difficulties involved in identifying earnings differentials with productivity differentials force to be somewhat more cautious in drawing sweeping conclusions as to the effects of education on national output.[10]

2. The Criterion of Contribution of Education to Gross National Income. According to this criterion, investment on education is determined by its contribution to increase in gross national income or physical capital formation over a period of time. Schultz analysed the contribution of education to growth in national income in the US from 1900 to 1956. and came to the conclusion that the resources allocated to education rose about 6.5 times: *(a)* relative to consumer income in dollars; *(b)* relative to the gross formation of physical capital in dollars. In other words, the income elasticity of the demand for education was about 3.5 times over the period, and alternatively, investment in education contributed 3.5 times more to the increase in gross national income than investment in physical capital.[11] Schultz has also calculated the total stock of educational capital at different points in time. He added together the possible

earned income forgone (or the opportunity cost) by those enrolled in schools, colleges, and universities and the expenditure for formal education of all types with allowance for depreciation. The total stock of educational capital in the labour force of the US rose from $ 63 billion in 1900 to $ 535 billion in 1957, and the ratio of the stock of educational capital to the stock of physical capital rose from 22 per cent in 1900 to 42 per cent in 1957.[12]

Similar estimates have been made by P.R. Panchmukhi in India following Schultz's method. His estimates of educational capital reveal that the total cost of formal education in India rose from Rs 341 crores in 1950-51 to Rs 769 crores in 1959-60.[13]

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9. R.S. Eckaus, 'Economic Criterion for Education and Training', *RES*, May, 1964.

10. W.G. Bowen, *Economic Aspects of Education*, 1964.

11. T.W. Schultz, 'Capital Formation by Education." *JPE*, December, 1960.

12. T.W. Schultz, *Education and Economic Growth in Social! Forces Influencing American Education*, N.B. Hentry (ed.) 1961.

13. P.R. Panchmukhi, 'Educational Capital in India.' *IJE*, January-March , 1965.

Its Evaluation. These estimates are more realistic than the estimates of returns on education as they measure the impact of educational investments on the economy. They are based on the opportunity cost of education which means foregone incomes of students while in schools, colleges and universities, and expenditure incurred on formal education after making due allowance for depreciation. But the calculation of foregone incomes is not so simple and poses a number of problems. Are these to be estimated from the present earnings of persons in the same age group who never went to school? This is the case in underdeveloped countries where the majority of young persons have no schooling but they earn in family vocations. Thus the real cost of education may be a consequence of foregone earnings while attending the school. Moreover, there being widespread unemployment, wages as foregone earnings cannot measure the impact of educational investments on national income accurately. Under such circumstances, the estimation of foregone earnings becomes arbitrary as the increased supply of labour tends to be lower than the actual earnings. Again, social costs are also an important factor. For,

the cost involved in having potential members of labour force to go to school rather than to work is not only a private cost to the students or their families but also a social cost; a potential addition to national product remains unrealized. To Balogh[14] calculations made about the profitability of education are not merely fallacious in a technical economic sense but immoral politically.

3. The Residual Factor Criterion. Solow, Kendrick, Denison, Jorgenson and Griliches, Kuznets,[15] and other economists have tried to measure what proportion of the increase in the GNP, over a period of time, could be attributed to the measurable inputs of capital and labour, and what proportion of the increase in the GNP could be ascribed to other factors, frequently grouped as 'residual'. The most important of these residual factors are: education, research, training, the economies of scale and other factors affecting human productivity. Denison's estimates for the United States for 1929-57 reveal that the contribution of education to the growth of total real national income was 23 per cent. So far as the contribution of the "residual" factor is concerned, it accounted for 31 per cent of total growth of national income. This was due to the impact of the advance of knowledge (20 per cent) and the economies of scale resulting from the growth of national markets (11 per cent). On the other hand, Solow in his study of the United States for the period 1909-49 attributed 90 per cent of the average growth rate of output per head to the "residual factor," falling under the general heading of technical change.

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14. T. Balogh, 'The Economics of Educational Planning,' *Comparative Education,* October 1964.

15. R.M. Solow, 'Technical Change and the Aggregate Production Function," *R.E. & S.,* 1957; J.W. Kendrick, *Productivity Trends in the United States,* 1961; E.F. Denison, *The Sources of Economic Growth in the United States and the Alternatives Before US.* 1962; D.W. Jorgenson and Z. Griliches, "The Explanation of Productivity Change," *R.E.S* , Vol. 34, 1967; S. Kuznets, *Modern Economic Growth,* 1966.

Its Criticism. The residual factor criterion is not tree from certain weaknesses.

First, the residual factor has been used as a much wider term which includes such varied factors as the economies of scale, technical change, besides education research and training. These factors make the criterion complex.

Second, the residual factor may also include some improvements in capital assets which may, of course, be attributed to improvement in human knowledge and skills.

Third, this criterion does not make any distinction between formal and informal education, or in the quality or content of education.

Fourth, Jorgenson and Griliches in their study reveal that the "residual" which Denison attributes to 'advance in knowledge' is small and not large. The fact that the residual is small indicates that the contribution of investment to economic growth is largely compensated by the private returns to investment.

Fifth, in their study of the U.S. economy for 1945-65, Jorgenson and Griliches find virtually no "residual" to explain after making corrections for aggregation errors for capital, labour, prices, etc. After making adjustments for such errors, the contribution of residual is reduced to 0.1 per cent per year.

Sixth, the "residual" criterion is based on the production function which is characterised by constant returns to scale. In reality, a developed economy is subject to increasing returns. As a result, more of the growth of output would be credited to the increase of physical inputs and less to the increase in the "residual factor." It but not the least, capital's contribution to economic growth has been underestimated in the residual criterion. If the resource put into the advance in knowledge were counted as investment and the capital stock were so defined as to include this type of investment, more of the growth rate would be attributed to increase of the capital stock and less would be left in the residuary category of increases in knowledge, skills, training, etc. Thus the residual criterion has not received enough support from economists.

4. The Composite Index Criterion. Harbison and Myers[16] have developed a composite index criterion of human resource development on the basis of certain human resource indicators. The composite index is used as the basis for ranking seventy five countries and grouping them into four levels of human resource development, namely, underdeveloped, partially developed, semi-advanced and advanced. Then they have attempted to study the relationships between these indicators and indicators of economic development.

16. Op. cit., Chapters 3-7.

They have described the following indicators of human resource development: (1) Number of first and second level teachers per 10,000 population. (2) Engineers and scientists per 10,000 population. (3) Physicians and dentists per 10,000 population. (4) Pupils enrolled at first (primary) level of education as a percentage of the estimated population aged 5 to 14 inclusive. (5) The adjusted school enrollment ratios for first and second levels combined. (6) Pupils enrolled at second (secondary) level of education as a percentage of the estimated population aged 15 to 19 inclusive, adjusted for length of schooling. (7) Enrollment in third (higher) level of education as a percentage of the age group 20 to 24. (8) The percentage of students enrolled in scientific and technical faculties in a recent year. (9) The percentage of students enrolled in faculties of humanities, fine arts, and law in the same year.

The first three indicators are partial measures of the stock of human resources and the next four are measures of additions to the stock.

After a number of trials with some of the indicators, Harbison and Myers have developed a composite index to rank seventy five countries according to four levels of human resource development. The composite index is simply the arithmetic total of (1) enrollment at second level of education as a percentage of the age group 15 to 19, adjusted for length of schooling, and (2) enrollment at the third level of education as a percentage of the age group, multiplied by a weight of 5. In their opinion, higher education should be weighted more heavily than second-level in such an index.

For statistical analysis, they take indicators of economic development: (1) GNP per capita in US dollars, and (2) the percentage of the active population engaged in agricultural occupations. Besides, they have used two more indicators: (*a*) public expenditure on education as a percentage of national income, and *(b)* the percentage of the total population in the age group 5 to 14, inclusive.

Harbison and Myer's study shows a close association between enrollment ratios at all levels of education and GNP per capita. The highest correlation coefficient (0.888) is found between GNP per capita in US dollars and the composite index of human resource development which is a combination of

second-level and third-level enrollment ratios.

Its Criticism. The composite index is a useful criterion to measure the role of different levels of education in formulating an education policy geared to the economic development of LDCs. It expresses quantitative relationships between indicators of human resource development and indicators of economic development. But these relationships do not establish qualitative relationships. Further, the composite index does not reflect the influence of other factors such as rich natural resources or less population level which may lead to higher GNP per capita.

Conclusion. Whatever the difficulties associated with the problem of investment in human capital, it is now fully recognised that the growth of LDC is held back not by the shortage of physical capital as by the shortage of critical skills and knowledge which in turn limit the capacity of the economy to absorb the available physical capital stock. Thus human capital formation is regarded even more important than material capital formation.

MANPOWER PLANNING IN LDCS

Manpower planning relates to the long-range development of semiskilled and skilled manpower requirements of the economy, and to plan educational priorities and investments in human resource development so as to enlarge employment opportunities in future.

The general approach to manpower planning in LDCs is three-fold: *first,* to identify the skilled manpower shortage in each sector of the economy and reasons thereof; *second,* to identify the manpower surpluses in both the modernising and traditional sectors and the reasons for such surpluses; and *third,* to lay down a strategy for manpower planning.

We will discuss these aspects of manpower planning as under:

MANPOWER SHORTAGE

The manpower shortage in LDCs fall into several categories:

1. Current Shortage. There is a shortage of *highly educated* professional

manpower in all LDCs. Such manpower includes scientists, engineers, doctors, agronomists and veterinarions. They live in cities and do not like to move to rural areas where their services are needed the most. Thus their shortage is increased by their relative immobility.

The shortage of *sub-professional* manpower is even more acute than the professional manpower. Such manpower includes civil, mechanical, electrical, chemical, metallurgical and agricultural technicians; foremen, spinning, weaving and finishing masters; nurses, compounders, midwives and health assistants, etc. Some of the reasons for their shortage are: (*a*) the failure to recognise on the part of LDCs that the requirements for such sub-professional manpower are many times higher than for professional personnel; *(b)* the few persons who are qualified to enter a technical institute prefer to enter a university because the holder of a university degree has a higher status and pay; and (*c*) the seats available in the technical institutes are very few as compared to the universities.

Shortage also exist at the *top-level managerial and administrative personnel* in both the private and public sectors. Such shortage exist in respect of general managers, production managers, sales managers, works managers, cost accountants and company secretaries. There is also the shortage of persons with entrepreneurial abilities.

There are shortage of trained primary, secondary and craft *teachers* and *instructors* because of their low salaries. They tend to leave the technical profession as and when they find more attractive jobs in other profession. The shortage of science and mathematics teachers is particularly acute in secondary schools.

At the skilled workers level, there is shortage of *craftsmen and technical clerical personnel.* In the former category are included tool-makers, fitters, machine-tool operators, welders, moulders, electricians, blacksmiths, painters, motor mechanics, etc. The shortage of technical clerical personnel relate to typists, stenographers, bookkeepers, and business machine operators.

Besides, there is a dearth of several *miscellaneous categories* of personnel in LDCs, such as, accountants, staticians, economists, radio and television specialists, and airplane pilots.

2. Invisible Shortage. There is invisible manpower shortage in the form of unfulfilled jobs in LDCs, despite widespread unemployment and under employment. In the majority of establishments persons with the requisite skills are not available. As a result, a number of posts remain vacant. But to carry out such jobs, the concerned establishments employ persons not possessing the required education and training for such jobs. This affects adversely productivity and production of such establishments.

3. Frictional Shortages. The LDCs also experience frictional manpower shortages due to lack of an organised employment market, increase in the sudden demand for manpower in labour shortage regions, and immobility of labour. For example, agricultural transformation and urbanisation has created such shortage in Punjab.

4. Replacement of Foreign Personnel. There are current manpower shortage of highly skilled manpower at the top level in the LDCs of Africa and the Gulf countries due to replacement of foreign personnel. "The strategic technical positions in the public services, the top positions in private industry and commerce, and most of the higher positions in education are of necessity, held by non-indigenous personnel." With the gradual withdrawal of foreign personnel in the wake of nationalisation, manpower shortages are likely to increase further in the oil refineries, the mines; the plantations, the big commercial establishments, the factories, the banks, the universities, the hospitals, 'the power plants, etc. in such countries.

MANPOWER SURPLUS

Manpower surplus relate to both unskilled and skilled workers available for and in search of gainful employment. The manpower surplus in LDCs consist of the following categories:

1. The Underemployed include both open and disguised unemployed. Open underemployed are those who are working less than the normal hours. Disguised unemployed are those whose contribution to output is less than what they can produce by working for normal hours of work per day. Both these forms of underemployment exist in rural and urban areas in the LDCs. In rural areas the underemployed include the landless agricultural workers, marginal farmers, peasants, artisans, craftsmen and self-employed persons. They are the

result of backward agricultural methods and feudal systems of land tenure. In urban areas, they include hawkers, petty traders, workers in service and repair shops, porters, shoeshine, etc. who are not qualified for medium and higher skilled jobs.

The unemployment estimates under this category are available only on the basis of NSS Rounds in a number of developing countries like India. They are based on usual status, weekly status and daily status which bring out the chronic, seasonal and part time unemployment and under employment respectively. The weekly and daily status represent the average numbers of persons unemployed per week and per day respectively during the survey period. On these basis, some economists estimate the number of underemployed to be as high as 50 to 80 per cent of the potential labour force in the LDCs.

2. The Educated Unemployed and Underemployed also reflect the surplus manpower in LDCs. The educated manpower refers to those persons who have obtained at least a matric/secondary certificate. In the LDCs, the demand for education is high because the private cost of education is low and a higher level of education is associated with better job opportunities, higher level of income and better status. Since technical education is relatively costly and restricted, more persons in the younger group are attracted towards higher education in colleges and universities. But with their formal education they are neither able to get jobs nor are fit for self-employment. Structural rigidities and slow rate of growth have failed to increase job opportunities for them. Consequently, the educated manpower has been on the increase. Further, there is underemployment among the educated who take up jobs below the skill levels they have obtained through education and training,

3. Urban Unemployed and Underemployed. Besides the surplus educated and uneducated manpower already existing in urban and rural areas of LDCs, urban unemployed and underemployed are on the increase with development. The rapid increase in population, over crowding on the land, the seasonal nature of agricultural operations, the spread of education in rural areas and the building of roads and the establishment of new industries in urban areas are encouraging migration of people to towns and cities. But the industrial sector has failed to absorb the growth of labour force thereby increasing urban unemployment and underemployment.

STRATEGY FOR MANPOWER PLANNING[17]

Harbison points toward a three-pronged strategy for human resource development to overcome the manpower shortage and surpluses in LDCs. The essential components of such a strategy are: (1) the building of appropriate incentives; (2) the effective training of employed manpower, and (3) the national development of formal education. These three elements of manpower strategy are interdependent and progress in one is dependent upon progress in the other two. Therefore, LDCs should plan an integrated attack on all three fronts simultaneously.

1. Building of Incentives. In the LDCs, people should be encouraged to engage in such productive activities which are needed to accelerate the process of economic development. Since all skills are critically scarce, scientists, engineers, doctors, managerial and administrative personnel, etc. should be encouraged and given due status. In the majority of LDCs due recognition in the form of good salary and high social status is not given to persons possessing such critical skills. Often political pressures, caste, creed and regionalism result in a tragic waste of precious talent, low morale and undermining of efficiency. Some of the more ambitious, having resources migrate to the advanced countries for better opportunities. To avoid the brain drain, the LDCs should build appropriate incentives within the country. This equally applies to teachers, techinicians, nurses, agronomists and other semi-professional groups.

"The building of incentives is crucial for both the accumulation and investment of human capital. In fact, investments in education may be wasted unless men and women have the will to prepare for and engage in those activities which are needed for accelerated growth." Moreover, the market mechanism should be made more effective for the optimum allocation of manpower.

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17. This also relates to the *Strategy for Human Resource Development.*

2. Training of Employed Manpower. The second important plank for the strategy of human resource development is to upgrade the qualifications and improving the performance of employed manpower in strategic occupations.

For this purpose, efforts should be made to develop management-training programmes, supervisory-training courses, productivity centres, institutes of public administration, etc. To meet the expanding manpower needs of firms, on-the-job training and apprenticeship programmes should be started. Universities and Vocational institutes can start part-time extension and evening classes. The greatest need is for massive agricultural extension services and rural community reorganisation and development programmes for the transformation of traditional agriculture and rural life. These require the training of local youngmen as village-level and extension workers so that the farmers are provided basic education in rural development and their skills are upgraded. But these measures are dependent upon basic programmes of land reform.

3. Development of Formal Education. The third component of the strategy tor manpower planning is the building of the system of formal education. "In planning the development of formal education, the LDCs are faced with difficult choices. Since education of all kinds is under-developed, it would be desirable to expand it rapidly at every level. A strong case could be made for a crash programme to extend and improve primary education. Secondary education is, of course, the most critical bottleneck in providing new additions to the desperately short supply of high-level manpower of all kinds. Expansion of higher education is indispensable if foreigners are to be replaced by local nationals."

So far as the *primary education* is concerned, the emphasis should be not only on increasing the number of pupils enrolled but also on improving the quality of education by employing qualified teachers. The major effort should be to apply new techniques of education such as visual aids, instruction by radio and television, appropriate texts and simplified curricula.

But the expenditure on primary education should be given a lower priority than on secondary and higher education. To keep capital costs of primary education within limits, emphasis should be on improving teaching personnel and developing better educational techniques. Further economy can be made by avoiding expenditure on school buildings. The local villagers should be asked to construct them with local labour and materials.

The LDCs should give top priority to *secondary education* because it is the

secondary-level educated persons who are needed at all levels in government, industry, commerce and agriculture. They are also required to replace foreigners and to meet the vast manpower requirements of a growing economy. The purpose of secondary education should be broadbased to provide education in science, mathematics, arts and humanities so that students may take jobs directly, or become technicians, or school teachers, or enter the universities. Therefore, emphasis should be on multipurpose secondary schools. In the area of higher education, the strategy stresses the need for investing in such sub-professional personnel as agricultural and engineering assistants, secondary school teachers, nurses, medical technicians, typists, stenographers, mechanics of various categories, etc. For their education and training, polytechnic and other technical institutions should be established by encouraging private enterprise. This is because technical education costs four to six times as much per student as non-technical education.

So far as the *university-level* education is concerned, the agricultural, scientific, medical, and engineering faculties should be expanded; while that of arts, humanities and law should be limited. Research institutes in natural and biological sciences, engineering and agriculture should be established to increase the country's capability of modern science and technology to its own needs.

Since higher education is costly, emphasis should be on low-cost buildings, utilising fully the existing plant and equipment, and other economy measures without lowering standards.

Another element in the strategy for formal education is *adult education.* The programme of formal adult education should include "agricultural and co operative extension work, fundamental education and other organised programmes to enable men and women to participate more effectively in their country's economic development." Investment on adult education is time-saving and cost-reducing and provides more lucrative returns than any other kind of educational investment.

Conclusion. The three elements of human resource development discussed above should form part of a country's development programme. To solve the problem of surplus manpower requires check over rapidly increasing population, removal of market imperfections to improve labour mobility,

building of appropriate incentives, creation of critical skills among the employed, and the unemployed through formal education. Above all, "successful development requires the building of effective government organisations, private enterprises, agricultural extension forces, research institutions, producer and consumer co-operatives, education systems, and a host of other institutions which mobilise and direct human energy into useful channels."

ESTIMATING FUTURE MANPOWER REQUIREMENTS *

The estimation of future manpower requirements is the most difficult task for planners and policy makers. At the same time, it is an indispensable step in planning for future manpower requirements of the economy, for building of educational and training institutions and to estimate the costs involved therein. Since the development of manpower is a long-term process, the country's requirements must be estimated for one or two decades in advance. This is because it takes a very long time "to build schools, to train teachers, and to fill the educational pipe lines in primary and secondary schools in order to expand the number of university graduates." There are a number of methods to estimate future manpower requirements but we will discuss a few important ones here.

1. Manpower Requirements Approach. Backerman and **Parnes** have developed. "The manpower requirements approach to educational planning." They attempt to define educational needs in terms of productivity and a given pattern of economic growth. This method involves the following steps:

(*a*) The analysis of the existing manpower structure is made by (*i*) preparing an inventory of employment and short-term requirements for manpower for each major sector of the economy; (*ii*) a general appraisal of the educational system; (*iii*) a survey of programmes for on the job training; and (*iv*) an analysis of the structure of incentives and proper utilisation of present manpower.

(*b*) On the basis of an economic plan, the patterns of output for the various sectors of economy are projected for the forecast year. Then total employment for each sector and the economy is estimated on the basis of some assumptions about productivity.

(c) The total employment for the forecast year is allocated among the various occupations for each sector according to occupational classification system chosen. Then the requirements for each occupational category are aggregated from the various sectors to arrive at the total manpower-stocks required in the forecast year. In these estimates, allowance is made for the effects of increase in productivity on the occupational structure.

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*This section draws heavily on F. Harbison and C.A. Myers, *Op. cit.*

(*d*) The supply of manpower with each minor type of educational qualification is estimated for the forecast year on the basis of present stocks of manpower, anticipated outflows from the existing educational system as presently planned, and allowances for losses due to death, retirement, and other reasons for withdrawal from the labour force.

(*e*) The estimated output on manpower from the educational system are compared with the required manpower outputs as determined in the above step *(d)*.

(f) The orders of magnitude for expansion of the educational system are then established to close the gap between anticipated manpower requirements and presently expected manpower supply.

This method has been used with slight modifications by Turkey, Greece, Yugoslavia, Italy, Spain and Portugal. It links manpower requirements to productivity and is designed to identify manpower difficulties which could hamper production.

Its Weaknesses. But this approach has certain weaknesses. The productivity criterion is not so useful in estimating manpower requirements in agriculture where it is not possible to estimate future employment by forecasting about productivity in especially in countries having massive disguised unemployment. The LDCs “lack empirical data on which to base estimates of expected increase in productivity and the bearing of these on changes in occupational requirements.” Another difficulty relates to “the determination of required educational qualifications of high-level occupations for the forecast year. To a large extent, they may depend upon the supply structure of educated

persons at that time." *Lastly*, this approach gives an impression of making forecasts about a future situation. But due to complexity of economic, social and political events in LDCs such predictions are dangerous. Thus the future manpower requirements approach based on productivity analysis is arbitrary.

2. Tinbergen-Correa Model. Jan Tinbergen and H. Correa in their study "*Quantitative Adaptation of Education to Accelerated Growth*" have build an input-output type model for estimating future manpower and educational needs. They attempt to relate directly needed secondary and higher educational outputs to given rates of economic growth, without using the intermediate step of calculating occupational requirements. Essentially,, the number of persons required from each educational level is calculated from a series of linear equations which relate the stock of persons completing a given level of education and the number of students' in each level to the aggregated volume of production. Its purpose is to suggest what structure of the educational system is needed in order to let the economy grow at a certain rate, and how that structure should change with changes in the growth rate.

The model is based on certain implicit assumptions: (*a*) education precedes other factors in the production process due to the long time involved in it; *(b)* there is a fixed coefficient between the number of persons with secondary and higher education levels and the volume of production in the economy; (*c*) The number of persons with secondary and higher education is the correct number for the existing level of aggregated output; *(d)* graduates of the educational system are fully-employed; (*e*) the teacher-student ratio is fixed over-time; *(f)* labour is substitutable at particular level of education; and *(g)* technology and productivity remain constant.

Its Criticism. The Tinbergen-Correa model provides a useful and convenient tool for estimating the educational requirements for economic growth. But it has been criticised due to its implict assumptions:

First, economists have questioned the assumption of fixed coefficients between the number of persons with secondary and higher education levels and the volume of production. This assumption is based on judgement rather than on reality. It may be applicable to advanced countries but not to LDCs. Further, economic growth implies a faster increase in the volume of production than of manpower. Therefore, the assumption of fixed coefficients breaks down.

Second, Balogh regards the model as simply a quantitative approach to education for he did not find a stable relation between the aggregate output and education. He opines that increasing the conventional education of the western type in LDCs might even reduce output and retard growth.

Third, the assumption that the student-teacher ratio is fixed overtime is based on the experience of developed countries and does not hold in the case of LDCs.

Fourth, the assumption that the number of persons with secondary and higher education is the correct number for the existing level of aggregate output is untenable because there are usually acute shortages or large surpluses in LDCs.

Fifth, the assumption that technology and productivity remain constant in the time period completely ignores their effects on required occupations and educational qualifications.

Lastly, the Tinbergen-Correa model makes “no distinction between technical or academic education, makes no allowance for qualitative imbalances in school curricula, and fails to distinguish between the major economic sectors of the economy.”

CHAPTER

Entrepreneurship in Economic Development

ROLE OF THE ENTREPRENEUR

The word “entrepreneur” has been taken from the French language where it was originally meant to designate an organizer of musical or other entertainments. In economics, an entrepreneur is an economic leader who possesses the ability to recognise opportunities for successful introduction of new commodities, new techniques, and new sources of supply, and to assemble the necessary plant and equipment, management, and labour force and organise them into a running concern. Whatever be the form of economic and political set-up of the country, entrepreneurship is essential for economic development. In a socialist state, the state is the entrepreneur. So is the case in underdeveloped countries where private entrepreneurship is shy in undertaking the risks associated with new ventures. But in advanced capitalists societies, private entrepreneurs have played the crucial role in economic development.

Over the years, the functions of an entrepreneur have undergone many changes at the hands of economists. According to some economists, the function of the entrepreneur is to undertake risks and uncertainty, to others the coordination of productive resources, to Schumpeter, in particular, the introduction of

innovations, and to still others to provide capital. In whatever sense we may view the entrepreneur, he is the kingpin of any business enterprise, for without him the wheels of industry cannot move in the economy. As aptly pointed out by Yale Brozen, "The private entrepreneurship is an indispensable ingredient in economic development over the long period."[1]

The entrepreneur may be a highly educated, trained and skilled person or he may be an illiterate person possessing high business acumen which others might be lacking. But he possesses the following qualities:

(*a*) He is energetic, resourceful, alert to new opportunities, able to adjust to changing conditions and willing to assume the risks in change and expansion;

(b) he introduces technological changes and improves the quality of his product; and

(c) he expands the scale of operations and undertakes allied pursuits, and reinvests his profits.[2]

According to Fritz Redlich,[3] the role of the entrepreneur can be divided into the capitalist, the manager, and the entrepreneur. Thus the entrepreneur supplies funds and other resources, supervises and coordinates productive resources, and plans, innovates and takes ultimate decisions. In a small enterprise, these functions may be performed by the entrepreneur himself. He has his property tied up in his concern which is exposed to the risks of business. He participates fully and often constantly in the actual productive process. According to Hoseltiz, "The chief characteristic of a small industrial entrepreneur is not so much his venturesomeness, nor his motivation to make profits, , but his capacity to lead other men in a common undertaking and his inclination to introduce innovations; and in the early stages of industrialization, ..the overwhelming bulk of these innovations are of a technological nature requiring the direct and immediate participation of the entrepreneur."[4]

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1. Williamson and Buttrick,*op. cit.*

2. James T. McCrory, *Small Industry in a North Indian Town,* 1962.

3. The Business Leader in Theory and Reality." *AJES,* Vol. 8., 1948-49.

4. Bert F. Hoselitz, 'Entrepreneurship and Economic Growth,' *AJES*, Vol. 12, October, 1952.

In modern corporations, the entrepreneurship is vested in different persons. The shareholders of the company are the capitalists. The managerial function is performed by a number of persons who are specialists in their respective fields, such as the sales manager, the purchase manager, the production manager, the personnel manager, and so on. The entrepreneurial function is performed by the chairman of the board of directors who takes major decisions through consultation and agreement.

Besides, there are the public enterprises in LDCs which are controlled and managed by the state. The capital is provided by the government, the managers for different departments are drawn from various field of specialisation, and the entrepreneurial decisions are taken by the managers and the party in power.

FACTORS IMPEDING THE GROWTH OF ENTREPRENEURSHIP

Given these three types of entrepreneurs, what are the factors that impede the development of entrepreneurship in underdeveloped countries.

Entrepreneurship is inhibited by the *social system* which denies opportunities for creative faculties. "The force of custom, the rigidity of status and the distrust of new ideas and of the exercise of intellectual curiosity, combine to create an atmosphere inimical to experiment and innovation."

In LDCs, traditional attitudes discourage full utilisation of the human resources. People are ranked not according to their capacity to do particular jobs but by sex, caste, clan and kinship. Individualistic spirit is absent. People prefer traditional trades and professions rather than venture in new trades. As pointed out by **Hagen,** "villagers and elite alike revere the same economic roles and spurn trade and business, and there is a feeling of repugnance toward work that soils one's hands, in such economies." Thus, "the value system minimises the importance of economic incentives,, material rewards, independence and rational calculation. It inhibits the development and acceptance of new ideas and objectives. In short, the cultural value system within many poor countries is not favourable to economic achievement."[5]

In such economies, extreme inequalities in the distribution of income and wealth also stand in the way of the growth of entrepreneurship. Hardly three to five per cent of the people are at the top of the income pyramid who save. They are mostly traders and landlords who do not like to undertake risks in new business ventures but invest in unproductive channels, such as gold, jewellery, precious stones, idle inventories, luxurious real estates, speculation, etc. However, there are some merchants and traders who mostly deal in consumer goods and act as moneylenders and real estate agents.

Besides, there exist a few entrepreneurs who are engaged in the manufacture of some consumer goods, and in plantations and mines that tend to become monopolistic and quasi-monopolistic. They develop personal and political contacts with the government official, enjoy a privileged position, and receive preferential treatment in financial, taxation, exports, imports, etc. It is they who start new industries and thus founded individual business empires, such as the Tatas, the Birlas, Ambanis and the Dalmias in India. Such big business houses inhibit the growth of fresh entrepreneurship within the country.

The thin supply of entrepreneurs in LDCs is also attributed to the lack of infrastructural facilities which add to the risk and uncertainty of new entrepreneurship. Such countries lack in properly developed means of transport and communications, cheap and regular power supply, availability of sufficient raw materials, trained labour, well-developed capital and money markets, etc.

Last but not the least, entrepreneurship is hindered by technological backwardness in LDCs. This reduces output per man and the products are also of substandard quality. Such countries do not possess the necessary technical know-how and capital to evolve their own techniques which may be output-increasing and labour-absorbing. Mostly they have to depend upon imported capital-intensive techniques which do not fit in their factor endowments. Besides, as revealed by Hoselitz, a number of economic, social and administrative resistances force people in such economies to give preference to out-moded techniques over output-increasing techniques.[6] So far as the Schumpeterian process of innovation is concerned, Professor Henry Wallich opines that, “one can hardly say that in less developed countries ‘innovation’ is its most characteristic feature. The process is better described perhaps as one

of assimilation. No one would deny of course, that to organise a new industry in a less developed country is an art of entrepreneurial initiative. But it is evidentally very different from the original process of innovation."[7] Thus the entrepreneur plays a secondary role in LDCs due to various economic, social and administrative obstacles noted above.

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5. Meier and Baldwin, *op. cit.*, pp. 298-99.

6. Problems of Adopting and Communicating Modern Techniques to Less Developed Areas.' *EDCC*, January, 1954.

7. A.N. Aggarwal and S.P. Singh, *op. cit.*, p. 193.

HOW TO ENCOURAGE ENTREPRENEURSHIP

Entrepreneurship is essentially a socio-economic phenomenon. In the past, entrepreneurs have emerged from a particular class. In the United Kingdom, the United States and Turkey, the entrepreneurs were largely from the field of commerce.[8] The emergence of smaller firms in France was due to their family pattern. In Japan, it was the Samurai's who turned to industry and kept their social structure intact by the expedient of adopting vigorous young businessmen or taking them into the family through marriage.[9]

On the other hand, Hoselitz's findings reveal that the founders of early industrial establishments in England, France and Germany were men with mechanical rather than commercial and financial skills. These men came from the ranks of artisans, labourers, yeomen, and cottagers. A few were sons of middle class parents. But the earliest entrepreneurs were men who worked with their hands, whose innovations were in the field of technology, and who in their majority came from the lower, propertyless classes.[10]

Myrdal in his *Asian Drama* points out that the Asian societies lack entrepreneurship not because they lack money or raw materials but because they have very few men with the right attitudes. The Japanese possess these attitudes in abundance judged by the results they have produced in the industrial field. The Chinese and Indians who left their homes in search of better fortunes in the early 20th century established themselves as 'emigre entrepreneurs' in Malaysia, Singapore, Indonesia, Myanmar, West Indies, and East Africa. Thus,

whatever be the motives which have led men to undertake the constructive entrepreneurial acts, this much appears sure that "these motives have varied greatly, from one society to another, and they have rarely, if ever, been motives of an unmixed material character."[11]

But the main problem in LDCs is to 'create a climate for entrepreneurship.' The creation of such a climate depends on the one hand, on establishing social institutions which make possible objectively the exercise of independent individual enterprises, and on the other, on the maturation and development of personalities whose dominant orientation is in the direction of productivity, working, and creative integration.[12]

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8. K. Kindleberger, *op. cit.*, p. 86.

9. M.J. Heryin, *Economic Growth of Brazil, India and Japan*, 1956 (ed.), S. Kuznets.

10. *Loc. cit.*

11. W.W. Rostow, *op. cit.*

12. B. Hoselitz, *op. cit*

The realization of the first condition depends on a series of political acts which include the modification of the social institutions, the protection of property rights efficiently and the maintenance of law and order within the country. Besides, it requires the establishment of financial institutions which collect savings and canalise them for entrepreneurial activities. To facilitate this process, such financial institutions like the saving banks, investment banks, and the complex of brokers, dealers and commercial banks that comprise the capital and money markets are required. The government should adopt such monetary and fiscal policies which encourage the growth of entrepreneurship.

The shortage of skilled personnel of various kinds such as workers, scientists, technicians, managers, administrators, etc., poses a serious problem in the success of entrepreneurship in LDCs. It necessitates the setting up of scientific, technological, managerial, research and training institutes. Though management and entrepreneurship are two different things in both the private and public sectors, yet scientific, technical and managerial personnel are very important for the success of entrepreneurship.

There is also the need to establish an Entrepreneurship Development Institute in every LDC, as has been done in India in 1983. Such an institute should include a wide spectrum of entrepreneurial and related activities for the selection, development and training of persons for entrepreneurship.

Apart from providing economic overhead capital, the state should also help in evolving appropriate technologies in various fields which may be in keeping with the factor endowments of the country. In case this is not possible, the LDCs should benefit from the vast fund of knowledge in the field of technology of the advanced countries and modify and adapt the techniques of the latter according to their social, economic and technical absorption capacity and requirements. Facilities to finance such techniques and the supply of raw materials, and wider markets will further help in increasing the supply of entrepreneurs.

The provision of all the above noted social, economic and technological institutions will push even the latent entrepreneurship in the right direction.

The supply of entrepreneurship depends not only on a set of particular institutions but also upon the development of appropriate personality and motivation which should lead to the growth of entrepreneurship in LDCs. McClelland in *The Achieving Society* has propounded a theory based on his researches that entrepreneurship ultimately depends on motivation. It is the need for achievement (*n*-achievement), the sense of doing and getting things done, that promotes entrepreneurship. According to him, *n*-Ach (n-achievement) is a relatively stable personality characteristic rooted in experiences in middle childhood. Variations in *n*-Ach levels were correlated with the stories in children's text books, and it was found that *n*-Ach was very high in the United States of America 80 or 90 years ago. It is the highest in Russia and China now. It is rising in such developing countries as Mexico and Nigeria. He attributes high *n*-Ach in these countries to ideological reform hypothesis, to Protestanism in Europe and America, to zealous Communist ideology in Russia and China, and to the spirit of nationalism in the developing countries.

No doubt the *n*-Ach factor is important for the growth of entrepreneurship, but it is not possible for LDCs to wait for 15 or 20 years to develop it among children through text books alone.

McClelland along with David Winter[13] conducted experiments in Kakinada town of Andhra Pradesh in India and revealed that neither money nor caste or traditional beliefs played an important part in the *n*-Ach factor in the emergence of entrepreneurship there. It was found that those who were trained in the Small Industries Extension Training Institute at Hyderabad in 1964-65 for a two-week motivation programme displayed more active entrepreneurial behaviour later on

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13. *Motivating Economic Achievement,* 1969.

Thus, motivations, abilities and congenial environment all combine to promote entrepreneurship. Since entrepreneurial motivations and abilities are long-run sociological problems, it is better to make the political, social and economic environment congenial for the growth of entrepreneurship in LDCs.

CHAPTER

Role of the State in Economic Development

INTRODUCTION

It is now universally recognized that in order to overcome the rigidities inherent in an LDC, the state must play a positive role. It cannot act as a passive spectator. The problems of LDCs are of such a magnitude that they cannot be left to the free working of the economic forces. Private enterprise is unable to solve them because it does not exist in the modern sense of the term. State action is, therefore, indispensable for the economic development of such countries.

There is then the need for speedy socio-economic reforms to move these countries off the dead centre of stagnation. In the early phase of development, investments will have to be made in those directions which promote external economies, that is, towards creating economic and social overheads like power, transport, education, health, etc. Private enterprise is not forthcoming to undertake these activities as the risks are large and profits are low. There is the need for balancing the growth of different sectors of the economy so that the supply is adjusted to the demand. State regulation and control is, therefore, essential in order to attain such a balance. It necessitates control over

production, distribution and consumption of commodities. For this purpose, the government has to devise physical controls, and monetary and fiscal measures. Further, such measures are inevitable for reducing economic and social inequalities that pervade the underdeveloped countries. “Breaking social chasms and creating a psychological, ideological, social and political situation propitious to economic development becomes the paramount duty of the state in such countries.”[1]The sphere of state action is, therefore, very vast and all pervading. It includes “maintaining public services, influencing attitudes, shaping economic institutions, influencing the use of resources, influencing the distribution of income, controlling the quantity of money, controlling fluctuations, ensuring full employment, and influencing the level of investment.”[2] Some of these problems have already been dealt with in the preceding chapters, others are discussed below:

1. CHANGES IN INSTITUTIONAL FRAMEWORK

One of the important measures of economic development is to bring about changes in the socio-cultural attitude of the people in the LDCs. Such societies possess religious and cultural traditions which are not conductive to economic development. The institutional framework does not encourage rational individualistic behaviour, and the spirit of competition and enterprise. If economic development is to proceed, social attitudes, values and institutions entrenched in the joint family, caste, kinship and in religious beliefs must undergo change. These require social revolution. Social revolution does not imply the rapid overthrow of the existing institutions. The process of change has to be evolutionary. Otherwise, violent social changes will lead to discontentment, frustration, unrest and violence. These factors will, in turn, inhibit economic growth. Francis Hsu points out that “it took Europe ten centuries or more to produce an individualistic orientation of life which bore economic fruit two hundred years ago, and there does not seem to be any way in which a similar orientation could be generated in a matter of years or even decades.”[3] Any society attempting to institute it quickly will result “either in apathy or revolt.” Thus “much depends upon the way in which the process of growth and change it set in motion, the speed of the process and the extent to which it permeates all sectors of the economy. Generally, a slow but steady development is likely to create fewer political, social and economic tensions;

and it is likely that an attempt to force the pace too strenuously may also be economically wasteful because the social and personal changes may not take place which are necessary to enable the individual or the society to form the development necessary to enable individuals or the society to profit and sustain it."[4]

Economic change is not brought about by institutional changes alone. Economic change may take place due to increased capital formation or as a result of technological change which may, in turn, cause institutional changes. Contrariwise, institutional changes may be caused by factors other than economic. Non-economic factors like changes in religious ideas or political framework may bring about changes in institutions. Thus there may be causal relationship between economic and institutional changes or these changes may be independent of each other. Institutions promote economic growth to the extent that they associate effort with reward, permit increased division of labour, expansion of trade and freedom to seize economic opportunities. Once the process of change starts it becomes cumulative. If a change starts in social institutions, people will seize new opportunities which will, in turn, further change the institutions.

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1. G. Myrdal, *Economic Theory and Underdeveloped Regions*, p. 811.

2. W.A. Lewis, *op. cit.*, pp. 376-383.

3. *In* Williamson and Buttrick, *op. cit.*, p. 357.

4. Bauer and Yamey, *op. cit.*, pp. 70-71.

The new opportunities may come about in many ways. "New inventions may create new commodities or reduce the cost of producing old commodities. New roads, new shipping routes or other improvements in communications may open up new opportunities for trade. War or inflation may create new demands. Foreigners may arrive in the country, bringing new trades, investing new capital or offering new chances of employment.'[5] Such new opportunities bring about changes in institutions. These changes are gradual and perceptible. They are initiated by innovators, the new men, who endeavour to break with the past, and mould the old institutional framework into a new setting.

These innovators are townsmen. They face and resist political and social

forces. By providing larger and newer opportunities in the economic field, they are ultimately successful in altering old beliefs and institutions. Similarly, contact with foreigners may be instrumental in weakening the established pattern of society. In India, the building of the railroads, the spread of western education and establishment of industrial centres in the 19th century helped in loosening social and family ties. It was the new attitude of social rationality which gave rise to popular movements for the political freedom of the country. Above all, it is the government which plays a crucial role in influencing the institutional framework. The government can do a lot by introducing reforms in social customs and religious observances, in the system of land use, and in the field of education. It can also initiate economic growth by maintaining law and order, by providing improved public utility services, by fostering new industries, etc.

2. ORGANISATIONAL CHANGES

Organisational changes also play an important role in economic development. They include the expansion of the size of the market and the organisation of the labour market. These changes can only be performed by the government in LDCs. It is the state which can develop the means of transport and communications for expanding the size of the market because private entrerprise is incapable of undertaking such schemes. Besides, the organization and development of financial institutions by the state can help the growth of agriculture and industries. Such financial institutions can be cooperative banks, land mortgage banks, industrial banks, financial and investment corporation, etc.

The organization of the labour market also falls under the functions of the government. An organized labour market increases the productivity of labour. The government helps in organizing labour by recognising labour unions. It fixes working hours, payment of wages, establishes machinery for settlement of labour disputes, provides for social security measures, etc. Such legislations are meant to establish cordial relations between the employers and employees. As a result, efficiency of labour increases which increases production and reduces costs.

Labour is mostly immobile in underdeveloped countries. The majority of

people live in rural areas and are engaged in agricultural operations for a limited period. So they are underemployed or disguised unemployed. Due to lack of information, they are not aware of employment opportunities in towns and industrial centres. The government can help them in getting jobs by opening information centres in rural areas and employment exchanges in towns. In this way, the government can help in the mobility of labour.

When with development labour moves from rural to urban areas, the problems of urbanisation arise which are also required to be solved by the government. Such problems relate to housing, drinking water supply, electricity, slums, transport, etc. The provision for such services as constructing housing colonies, schools, colleges, hospitals, parks, city transport, drinking water, electric supply, etc., falls within the purview of state functions.

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5. W.Lewis op. Cit ., p. 147.

3. SOCIAL AND ECONOMIC OVERHEADS

The provision of social and economic overheads in LDCs falls mostly under the state activities. The need for basic services like railways, road transport, telecommunication, gas, electricity, irrigation works, etc., is imperative for future development. Their development entails large investments which are beyond the capacity of private enterprise in such countries. Not only this, investments in public utilities are risky and their benefits accrue only over the long period. It, therefore, devolves on the state to provide these public utilities.

The government should formulate a plan for the development of essential services on a priority basis. If the immediate need is to provide irrigational facilities, that should be met by concentrating on minor irngational facilities instead of damming a big river. Moreover, the provision for public utility services does not necessarily imply that they should be owned and operated by the state. The state may approve the plan for a particular project, provide finance and other necessary constructional facilities to a private concern which would construct and own it. Its working might, however, be regulated by the state. In fact, ownership and operation of an undertaking by the state or the private enterprise depend on its nature and importance. In India, the development of the means of transport and communications falls within the

state activities. The railways, airways and other sources of communications are Government owned and operated, keeping in view their importance in a vast country like India. While the ownership of the road transport is in the hands of both the public sector and the private sector, though the entire operations are regulated by the state. Owning and plying a bus does not involve much expenditure and the returns are also quick as compared to the railways.

Education. Economic development is not possible without education. As Myrdal says, 'To start on a national development programme while leaving the population largely illiterate seems to met to be futile."[6] For economic development, it is the quality of labour that is more important. Unskilled workers, even working for long hours, will have a low per capita income. Illiterate and untrained persons cannot be expected to operate and maintain complex machinery. It is by investing in them that their productivity can be increased. It is through public education that the state can increase the effective labour supply and hence the productive capacity of the nation. An educational programme has to be wide and varied. There is the need for primary education so that every child of school going age may receive compulsory education. In order to provide material for the universities and to impart larger educational facilities, more secondary schools are required to be opened. At the same time, training institutes are needed for imparting instructions to mechanics, electricians, artisans, nurses, teachers, agricultural assistants, etc. In the higher educational echelon are the university education and research institutes for turning out ever increasing number of doctors, administrators, engineers, and all types of trained personnel. "Programmes of education lie at the base of the effort to forge the bonds of common citizenship, to harness the energies of the people and develop the nation and human resources of every part of the country."[7] Investment in such a vast and diverse field as education is only possible through the aegis of the state in LDCs.

Investment in human capital is highly productive. An LDC needs agricultural and industrial technicians, doctors, engineers, teachers, administrators, etc., who would lead to a greater increase of the flow of goods and services, thereby accelerating the tempo of development. But the problem of providing educational facilities to a multitude of people is not within the capacity of an under developed country due to paucity of funds. Whatever funds are available they have to be apportioned on the basis of priorities. And economists differ

on the question of priorities. Education is both a consumer and an investment service. To the extent education is an investment, it directly increases productivity.

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6. *An International Economy, op. cit.*, p. 186.

7. GOI, *Third Five Year Plan*.

Money spent on the education and training of doctors, teachers, engineers, administrators is as much a capital investment as money spent on building a dam. But when money is spent on literacy drives to educate the peasantry, it is not regarded directly productive by Lewis. He maintains that, "such part of education as is not a profitable investment is on par with other consumer goods, like clothes, houses or gramophones" for it helps the peasants, barber or domestic servants "to enjoy something more (books, newspapers) or to understand something better."[8] Prof. Galbraith, however, regards investment in educating the masses equally productive. He argues that "to rescue farmers and workers from illiteracy may certainly be a goal in itself. But it is also a first indispensable step to any form of agricultural progress. Nowhere in the world is there an illiterate peasantry that is progressive. Nowhere is there a literate peasantry that is not. Education so viewed, becomes a highly productive form of investment." Galbraith concludes: "That something is both a consumer service and a source of productive capital for the society does not detract all from its importance as an investment. Rather it enhances that importance."[9] It therefore, devolves on the state to initiate a long-term programme of educational expansion and reform on a broad front stretching from a literacy drive to the university level, so that in all branches of national life education becomes the focal point of country's development.

Public Health and Family Planning. Another sphere in which the state can undertake positive measures is public health. To increase the efficiency and productivity of labour, the health of the people must be progressively improved. Public health measures include improvement of environmental sanitation both in rural and urban areas, removal of stagnant and polluted water, slum clearance, better housing, clean water supply, better sewage facilities, control of communicable diseases, provision for medical and health services, especially in maternal and child welfare, and health education and

family planning, and above all, for the training of health and medical personnel. All this necessitates planned efforts on the part of the public authorities.

Public health measures assume great importance in LDCs mainly for *two* reasons: *Firstly,* they help in the development process by augmenting labour productivity and efficiency; and *secondly*, by reducing the mortality rate they tend to increase the rate of population growth, thus making it imperative for the state to adopt family planning and speedy development programmes. But all development efforts will be futile if the growth in numbers is not checked. Since the death rate is already on the decline in LDCs the remedy is to bring down the birth rate from 40 per thousand prevailing in such countries to 20 per thousand. No doubt there is greater need for accelerating development, but to increase per capita income and improve the standard of living, the rate of population increase must be checked and family planning programmes be given top priority. Dr. Stephen Enke has calculated that the value of a new-born baby's life-time net consumption in an LDC is approximately 125 dollars arter discounting his lifetime future production. 125 dollars is a negative value and an economic burden on overpopulated LDCs.[10] *Family planning* is the deliberate reduction of fertility. Family planning programme should consist of:

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8. *Op. cit.,* p. 183.

9. *Op. cit.,* pp. 46-49.

1. Education of the people in family planning, which should include sex education, marriage counselling and child guidance. The media for this may be social organizations, films, the radio, and literature.

2. Family planning services should be made on much larger scale. Family planning services can be integrated with the normal health and medical services. Family planning clinics should be opened in rural areas, in industrial and other establishments. There should be mobile units to educate the masses in the art of family planning. The help of voluntary organizations can also be taken. The family planning centres should tender free advice, distribute contraceptives, and even undertake vasectomy free of charge. They may be subsidized by the government.

3. Establishment and maintenance of a large network of centres for the training of workers.

4. An expanded research programme in biological, medical and population problems. In India such a programme includes:*(i)* development of studies of human genetics; *(ii)* studies in the physiology of reproduction; *(iii)* development of more effective local contraceptives; *(iv)* development of a suitable oral contraceptive; and (*v*) follow-up sterilization cases, both male and female, to investigate after-effects in such cases.

5. Contraceptives should be manufactured indigenously so that their supplies should not lag behind to implement a widespread family planning programme. Moreover, they should be simple, cheap and safe.

6. There should be financial and other incentives to encourage parents to have fewer children. Incentives may include payment to an individual or couple to limit children. The limit is two children in India and one child in China. Disincentives are the withholding of social benefits from or imposing penalties on those whose family size exceeds the desired norm.

7. Emphasis should be laid on removing social barriers to birth control, raising the marriageable age, longer breast-feeding, educating the women, and providing larger employment opportunities in the suburbia.

8. Some protagonists of family planning advocate legalized abortion. They cite the example of Japan to substantiate their argument wherein the decade following the Second World War, the birth rate was brought down to one-half of its previous level. It has been estimated that 66 per cent of the reduction in births was due to legalized abortion in Japan. In India, abortion has been legalized since 1976. Other LDCs can also follow the lead given by Japan.

Above all, there should be a population policy to reduce the rate of population growth. It should have a wide range of policies, direct and indirect, to bring socio-economic changes in order to reduce fertility.

To sum up, in the words of Lewis, “One needs to put all the ingredients into this pie; to convert social leaders into seeing the dangers of a high birth rate, so that the taboos and religious sanctions turn against it, instead of its favour; to

raise standards of living and education rapidly, so that women find it convenient to have fewer children; and to make widespread propaganda about birth control techniques. Action is needed on all fronts simultaneously."

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10. *Op, cit.*, pp. 363-371.

4. AGRICULTURAL DEVELOPMENT

Agriculture is the predominant occupation in LDCs and contributes more than half the share of the national income. Despite this, agriculture remains in a state of stagnation. The share of the national income is disproportionately small in relation of the number of persons engaged in it. For instance, in India about 70 per cent of the population is engaged in agriculture while it contributes roughly 50 per cent to the national income. The fundamental cause is the low agricultural productivity per acre. The reasons for the low yield are the uneconomic size of the holdings, the fragmentation of land holdings, the defective land tenure system characterised by high rents, and insecurity of tenure, the lack of adequate credit facilities, indebtedness, the absence of irrigational facilities and dependence on rainfall, the use of obsolete methods of production, and the excessive pressure of population on land.

In LDCs the peasants are poor, illiterate and ignorant. They lack organisation. They do not possess sufficient motivation for making improvement in land. Their way of living is regulated by customs and traditions. It, therefore, falls within the purview of the state activities to introduce land reforms and prepare plans for agricultural development. The success of a plan will ultimately depend on the extent to which agricultural productivity is increased. Increases in agricultural production are essential so as to meet raw material requirements of industry, to attain self-sufficiency in foodgrains, to hold the priceline, to raise larger resources for purpose of development, and to utilize in an effective manner the unutilized and underutilized manpower resources of the economy.

Shriman Narayan has listed the following main elements in the preparation of agricultural production plans at the village level: (*i*) full utilization of irrigation facilities, including maintenance of field channels in good condition for the beneficiaries, repairs, and maintenance of community irrigation works;

(ii) increase in the area under multiple cropping; *(iii)* multiplication in the village of improved seed and its distribution to all cultivators; (*iv*) supply of fertilizers; (*v*) programmes for composing and green manure; *(vi)* adoption of improved agricultural practices, *e.g.,* soil conservation, contour bunding, dry farming, drainage, land reclamation, plant protection, etc.; (*vii*) programmes for new minor irrigation works to be undertaken in the village, both through community participation and on an individual basis; *(viii)* programme for the introduction of improved agricultural implements;' *(ix)* programme for increasing production of vegetables and fruits; *(x)* programme for development of poultry, fish and dairy products; *(xi)* animal husbandry, *e.g.,* supply of stud bulls, establishment of artificial insemination centres and castration of scrub bulls etc. and *(xii)* programme for the development of the village fuel plantations and pastures."[11]

The success of the village production programmes will, however, depend on the extent to which the farmers are organised in *cooperative societies* and the governmental machinery is efficient to cope with the requirements of the agriculturists at the right time. In other words, there should be close *liaison* between the government and the village community through an institution like the Community Development Organisation. It has been a phenomenal success in the United States, and in India, the latter having borrowed the idea from the former. The community. Development Programme aims at raising agricultural productivity through the use of better techniques of cultivation, better seeds, fertilizers, and adoption of improved agricultural practices. It envisages improvement of irrigation, road, communications, health and sanitation services in the rural areas. This programme also concentrates on the development of "agro-type" village industries, and fish, poultry and dairy products. Above all, it aims at bringing about a change in the mental outlook of the rural people so as to attack the five giants— disease, hunger, ignorance, squalor and unemployment—that pervade an under developed country.

The success of agricultural development programmes will, however, depend upon *land reform measures* undertaken by the government. The main objectives of land reform measures, according to the Indian Planning Commission, have been *two-fold*:

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11. *Trends in Indian Planning, Op. cit.,* pp. 42-43.

(*i*) “to remove such impediments to increase in agricultural productivity as arise from the agrarian structure inherited from the past. This should help create conditions for evolving as speedily as possible an agricultural economy with high levels of efficiency and productivity” and

(*ii*) “to eliminate all elements of exploitation and social injustice within the agrarian system, to provide security for the tiller and assure equality of status and opportunity to all sections of the rural population.” Land reform measures include: (1) abolition of intermediaries; (2) security of tenure of tenants; (3) right to purchase land which tenants cultivate; (4) compensation for permanent improvements made on land by tenants: (5) to limit the rent charged by landowners; (6) fixation of ceilings on agricultural holdings; and (7) consolidation of holdings.

In the bizarre area of land reforms we should not forget that for sustained development of the economy undue fluctuations in agricultural prices are to be avoided and a reasonable amount of stability is to be maintained. This does not mean that prices of agricultural products should be kept at a low level, for low prices act as a disincentive to production. Therefore, reasonably fair prices should be fixed for agricultural products which should be guaranteed by the state.

5. INDUSTRIAL DEVELOPMENT

Another important function of the state is to develop the economy industrially. In LDCs, natural resources are undeveloped or less developed. Those countries which remained under the colonial rule their natural resources were mercilessly exploited by the foreigners who ruled over them. Therefore, it is not in national interest to leave the development of natural resources in the hands of foreign dominated Private enterprises in such countries after their independence. It devolves on the state to nationalise its mines, plantations, etc. It should get its natural resources surveyed, adopt a proper policy for their exploitation and development, and also establish industries for their most profitable utilisation.

In such countries, the private sector is primarily engaged in the manufacture of a few consumer goods for domestic consumption. But to accelerate the rate of economic development, the establishment of basic and key industries like iron

and steel, heavy electricals, heavy chemicals, fertilisers, machine tools, etc. is essential. Such industries require huge investments and have long gestation periods. Private enterprise is, therefore, reluctant to enter these areas of production. Thus it becomes the duty of the state to start industries in such fields.

Again, some consumer goods industries like sugar, cloth, etc., need rationalisation as they generally operate with old and worn out machines and techniques. On the other side, there is need to establish export promotion and import substitution industries for rapid economic development. Moreover, industries are concentrated in few big towns while the rest of the countryside is backward and devoid of any industries.

In order to overcome all these problems, it is the duty of the state to formulate and implement a judicious industrial policy so that necessary encouragement should be given to the development of cottage, small and large-scale industries. A policy of decentralisation of industries should be followed so that industries should be spread over all areas in accordance with their factor endowments. Even the adoption of a policy of establishing focal points of industries in and around small towns can go a long way in developing local resources and providing larger employment opportunities.

The state can also help in the growth of private industries by importing raw materials, capital equipment, machinery and technical know-how. The state can also help private enterprise in establishing industries by providing such facilities as cheap finance, tax rebate, power, water, transport, communications, cheap land for building factories, etc. Last but not the least, it is the state which can help the development of backward areas by starting public enterprises itself and by encouraging private enterprise to set up industries, thereby giving various facilities and concessions mentioned above.

6. MONETARY AND FISCAL POLICIES

The government also helps in economic development by adopting various monetary and fiscal policies. By adopting appropriate monetary and fiscal policies, the state is able to remove social, institutional and economic bottlenecks in underdeveloped countries. Monetary policy plays an important role in accelerating development by influencing the cost and availability of

credit, by controlling inflation, and by maintaining balance of payments equilibrium. The state does all this through the Central bank of the country. The Central bank controls credit, expands banking facilities by creating financial institutions, floats government loans and manages the public debt, and adopts interest rates in order to encourage saving and investment.

It is through fiscal policy that the government tries to correct inequalities of income and wealth that increase with development in underdeveloped countries. It expands internal markets, reduces unessential imports, counteracts inflationary pressures, provides incentives for desirable types of development projects, and increases the total volume of savings and investment. For all these, the government adopts appropriate taxation, budgetary expenditure and public borrowing policies.

7. INCREASE IN FOREIGN TRADE

Underdeveloped countries are foreign trade oriented but the size of foreign trade in terms of value and quantity is very small. They primarily export some primary products like minerals, raw materials, and agricultural products, and in exchange import manufactured consumer goods and capital goods. Since the latter goods are costlier than the former goods, the value of their imports is much higher than that of exports. This leads to problems of balance of payments and of foreign exchange which can only be solved by the government.

The government can solve these problems by adopting export promotion. It helps exporters by timely import of raw materials and capital equipments needed for the production of exportable goods, removing export restrictions, providing credit, insurance and transport facilities to exporters, and restraining growth of domestic consumption of commodities through fiscal or direct measures. Further, the state can provide tax incentives, enter into bilateral trade agreements with other countries, and participate in trade fairs in foreign countries for marketing exports.

Another important measure usually adopted by the government is to encourage import-substitution industries. For this purpose, it levies import duties, quotas, surcharges, and multiple exchange rates as price-protective devices, while tax exemptions and subsidies are used to reduce costs in import-substitution

industries.

It is also through foreign aid that the government tries to remove balance of payments difficulties. It imports capital goods, components, raw materials, oil, technical know-how, etc. directly from foreign countries or through international agencies.'

Thus by expanding the size of the markets for country's goods through foreign trade, the state is able to raise income, investment, and employment levels of the economy.

PART - V

INTERNATIONAL MEASURES FOR ECONOMIC DEVELOPMENT

CHAPTER

Foreign Trade and Economic Development

INTRODUCTION

The role of foreign trade in economic development is considerable. The classical and neo-classical economists attached so much importance to international trade in a counry's development that they regarded it as an engine of growth. The opposite view holds that historically foreign trade has led to international inequality whereby the rich countries have become richer at the expense of the poor countries. It is, therefore, contended that even if LDCs are required to sacrifice the gains from international specialisation, they can attain a higher rate of development by following the policies of import substitution. We shall first discuss how international trade helps economic development and then the opposite view as to how far it has inhibited the development of LDCs.

IMPORTANCE OF FOREIGN TRADE

Foreign trade possesses great importance for LDCs. It provides the urge to develop the knowledge and experience that make development possible, and the means to accomplish it. Haberler opines, "My overall conclusion is that international trade has made a tremendous contribution to the development of less-developed countries in the 19th and 20th centuries and can be expected to make an equally big contribution in the future . . . *and* that substantial free trade with marginal, insubstantial corrections and deviations, is the best policy from the point of view of economic development."[1]

DIRECT BENEFITS

When a country specialises in the production of a few goods due to international trade and division of labour, it exports those commodities which

it produces cheaper in exchange for what others can produce at a lower cost. It gains from trade and there is increase in national income which, in turn, raises the level of output and the growth rate of economy. Thus, the higher level of output through trade tends to break the vicious circle of poverty and promotes economic development.

An LDC is hampered by the small size of its domestic market which fails to absorb sufficient volume of output. This leads to low inducement to investment. The size of the market is also small because of low per capita income and of purchasing power. International trade widens the market and increases the inducement to invest income and savings through more efficient resource allocations.

Myint[2] has applied Smith's "vent for surplus" theory to the LDCs for measuring the effects of gain from international trade. The introduction of foreign trade opens the possibility of a "vent for suplus" (or potential surplus) in the primary producing LDCs. Since land and labour are underutilised in the traditional subsistence sector in such a country, its opening up to foreign trade provides larger opportunities to produce more primary products for export. It can produce a surplus of primary products in exchange for import of manufactured products which it cannot itself produce. Thus, it benefits from international trade. The vent for surplus theory, as applied to an LDC, is explained in Fig. 1. Before trade with under-utilised resources, the country is producing and consuming OX_1 of primary products and X_1E of manufactured products at point E inside the production possibility curve AB. With the opening up of foreign trade, the production point shifts from E to D on the production possibility curve AB. Now the utilisation of formerly underutilised land and labour enables the country to increase its production of primary exportables from OX_1 to OX_2 without any sacrifice in the production of other goods and services. Given the international terms of trade line PP_1, the country exchanges ED (= X_1X_2) more of primary exportables against EC larger

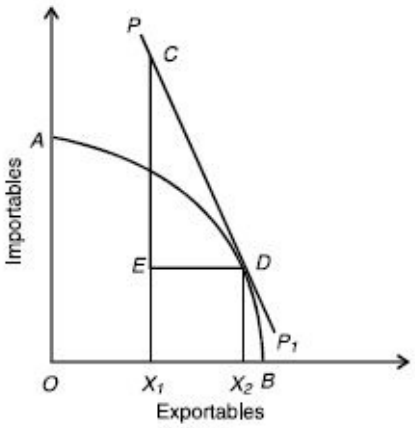

FIG. 1

manufactured importables.

Moreover, many under-developed countries specialise in the production of one or two staple commodities. If efforts are made to export them, they tend to widen the market. The existing resources are employed more productively and the resources allocation becomes more efficient with given production functions.

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1. G. Haberler, *International Trade and Economic Development*, 1959. Italics mine.

2. H. Myint, "The Classical Theory of Intenational Trade and the Under-developed Countries," *E.J.*, June, 1958.

As a result, unemployment and under-employment are reduced; domestic savings and investment increase; there is a larger inflow of factor inputs into the expanding export sector; and greater backward and forward linkages with other sectors of the economy. This is known as the "staple theory of economic growth", associated with Watkins.[3] Foreign trade also helps to transform the subsistence sector into the monetized sector by providing markets for farm produce and raises the income and the standards of living of the peasantry. The expansion of the market leads to a number of internal and external economies, and hence to reduction in cost of production. These are the direct or static gains from international trade.

INDIRECT BENEFITS

Besides, there are indirect dynamic benefits of a high order from foreign trade, as pointed out by Mill. By enlarging the size of the market and the scope of specialisation, international trade makes a greater use of machinery, encourages inventions and innovations, raises labour productivity, lowers costs and leads to economic development. Moreover, foreign trade acquaints people with new products, tempts and goads them to work harder to save and accumulate capital for the satisfaction of their new wants. It also leads to the importation of foreign capital and instills new ideas, technical know-how, skills, managerial talents and entrepreneurship. Lastly, it fosters healthy competition and checks inefficient monopolies. Let us study these indirect benefits of foreign trade to under-developed countries in detail.

1. Import of Capital Goods Against Export of Staple Commodities. Foreign trade helps to exchange domestic goods having low growth potential for foreign goods with high growth potential. The staple commodities of under-developed countries are exchanged for machinery, capital goods, raw materials, and semi-finished products required for economic development. Being deficient in capital goods and materials, they are able to quicken the pace of development by importing them from developed countries, and establishing social and economic overheads and directly productive activities. Thus, larger exports enlarge the volume of imports of equipment that can be financed without endangering the balance of payments and the greater degree of freedom makes it easier to plan domestic investment for development.

2. Important Educative Effects. Foreign trade possesses an "educative effect". Under-developed countries lack in critical skills, which are a greater hindrance to development that is the scarcity of capital goods. Foreign trade tends to overcome this weakness. For, it is, in the words of Haberler, "the means and vehicle for the dissemination of technical knowledge, the transmission of ideas, for the importation of know-how skills, managerial talents and entrepreneurship." The importation of ideas, skills and know-how is a great stimulus to technological progress in under-developed countries. It provides them with an opportunity to learn from the successes and failures of the advanced countries. Foreign trade helps in accelerating the development of poor countries by facilitating the selective borrowing of ideas, skills and know-how from the developed countries and adopting them in accordance with their factor endowments. Even the rapid development of the USA, Japan and Soviet Russia has been the result of the educative effect of foreign trade.

3. Basis for Importation of Foreign Capital. Foreign trade provides the basis for the importation of foreign capital in LDCs. If there were no foreign trade, foreign capital would not flow from the rich to the poor countries. The volume of foreign capital depends, among other factors, on the volume of trade. The larger the volume of trade, the greater will be the ease with which a country can pay back interest and principal. It is, however, much easier to get foreign capital for export-increasing industries than for import substitution and public utility industries. But from the point of view of the importing country, the use of foreign capital for import substitution, public utilities and manufacturing industries is more beneficial for accelerating development than merely for

export promotion. Foreign capital not only helps in increasing employment, output and income but also smoothens the balance of payments and inflationary pressures. Further, it provides machines, equipments, know-how, skills, ideas, and trains native labour.

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3. M.H. Watkins, "The Staple Theory of Economic Growth", *Canadian Journal of Economics and Political Science*, May, 1963.

4. Checking of Inefficient Monopolies. Foreign trade benefits an LDC indirectly by fostering healthy competition and checking inefficient monopolies. Healthy competition is essential for the development of the export sector of such economies and for checking inefficient exploitative monopolies that are usually established on the grounds of infant industry protection.

Conclusion. Thus foreign trade, in addition to the static gains resulting from efficient resource allocation with given production functions, powerfully contributes in four ways indicated above, by transforming existing production functions and pushing them upwards and outwards.

ITS CRITICISMS

The foregoing analysis, based as it is on the comparative cost doctrine, has been criticised by economists like Prebisch, Singer and Myrdal.[4] They opine that historically international trade has retarded the development of LDCs. Three arguments are usually advanced in support of this view that international trade has impeded development.

1. Strong Backwash Effects. International trade has strong backwash effects on the LDCs, according to Myrdal. He writes, "Trade operates (as a rule) with a fundamental bias in favour of the richer and progressive regions (and continues) and in disfavour of the less developed countries." Unhampered trade between two countries of which one is industrial and the other underdeveloped, strengthens the former and impoverishes the latter. The rich countries have a large base of manufacturing industries with strong spread effects. By exporting their industrial products at cheap rates to LDCs, they have priced out the small-scale industry and handicrafts of the latter. This has tended to convert the backward countries into the producers of primary products for

exports. The demand for primary products being inelastic in the export market, they suffer from excessive price fluctuations. As a result, they are unable to take advantage of either a fall or a rise in the world prices of their exports. The importing countries take advantage of the cheapening of their products because of the inelastic market for their exports. Similar advantages follow when there is any technology improvement in their export production. When the world prices of their products rise, they are again unable to benefit from it. Increased export earnings lead to inflationary pressures, malallocation of investment expenditure and balance of payments difficulties when they are wasted in speculation, conspicuous consumption, real estate, foreign exchange holdings, etc.

2. Adverse Effect of International Demonstration Effect. It has been contended that the operation of the international demonstration effect through foreign trade has adversely affected capital formation in LDCs.

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4. R. Prebisch, *The Economic Development of Latin America and its Principal Problems*, 1950; H.W. Singer, 'The Distribution of Gains between Investing and Borrowing Countries', *American Economic Review, May* 1950; G. Myrdal, *An International Economy*, 1956.

3. Secular Deterioration in Terms of Trade. In the opinion of Prebisch there has been a secular deterioration in the terms of trade of the LDCs. It implies that there has been an international transfer of income from the poor to the rich countries and that the gains from international trade have gone more to developed countries at the expense of the former, thereby, reducing their level of real income and hence capacity for development.

OVERVIEW

But all these criticisms are unfounded. There is no empirical evidence to prove that the development of the export sector has been at the expense of the domestic sector. Foreign trade has not always stood in the way of domestic investment. Nevertheless, as pointed out by Nurkse, "even unsteady growth through foreign trade is surely better than no growth at all."

The adverse effects of the demonstration effect are also exaggerated. Emulation of higher standards of living and superior consumer goods act as incentives to increased efforts and productivity on the part of the people of

LDCs. It encourages the development of service occupations to supply superior goods. It also exercises a healthy influence in stimulating local initiative and enterprise. Again, the adoption of the Western consumption standards tends to influence the subsistence sector favourably. The incorporation of milk, eggs, vegetables, and fruits in diet induces agriculturists to produce them more for the market, in addition to subsistence production. It involves the investment of more capital and making improvements in agriculture, dairy and poultry production. This also provides increased employment, income and leads to further capital accumulation. The subsistence economy itself tends to be converted to an exchange economy gradually. The government is encouraged to provide more amenities in the form of improved means of transport, communications, irrigation, power etc. There is also a tendency on the part of the people to move from the villages to towns to seek jobs in those secondary and service occupations which produce the new consumer goods and services. Imitation of advanced production methods further helps in increasing the rate of capital accumulation in LDCs. Governments in such countries have encouraged the transmission of improved techniques like the L-D process of steel production, the introduction of high-yielding maize hybrids, and Mexican wheat, the Japanese method of rice cultivation, improved seeds and fertilizers, etc. It is, therefore, not wholly correct to say that international demonstration effect inhibits the propensity to save and the rate of capital formation in LDCs. In fact, by imitating the consumption and investment patterns of the advanced countries, they have been able to accelerate the pace of economic development.

So far as the problem of deterioration in the terms of trade of the LDCs is concerned, it is conjectural and based on obsolete data. In the first instance, every LDC is dependent upon a very narrow range of export of primary products. Moreover, such countries produce only a part of the world's total exports of minerals and agricultural products. *Lastly,* this view fails to take into account changes in the pattern of exports and imports of under-developed countries. LDCs are no longer exporters of primary products and importers of manufactures. According to GATT, they import only one-third of their total consumption of manufactured articles and even this proportion is on the decline. They produce the remaining two-thirds at home. Mostly they import capital goods, raw materials and foodstuffs. Manufactured consumer goods hardly form 10 per cent of their total imports. On the other hand, their exports consist of textiles, light engineering goods, machine tools, steel, and a variety

of manufactured consumer goods. The reason for the deterioration in terms of trade of underdeveloped countries has not been the declining world demand for their primary products, but inflationary pressures leading to high costs and prices, and a large external deficit which acts as a drag on their exports.

CONCLUSION

Thus it is an erroneous view that international trade has operated as a mechanism of international inequality and has retarted the development of LDCs. Rather, foreign trade has acted as an *engine of growth* for them. Thus Cairncross is right in saying, “Over the past century and a half the growth of international trade has continued to open up new opportunities of specialisation and development for the countries engaged in it. These opportunities were particularly in the primary producing countries overseas that were still in the process of settlement, since trade enabled them to bring into use unexploited natural resources and freed them from the limitations of their own domestic markets.”

CHAPTER

The Debt Problem of LDCs

INTRODUCTION

The problem of external debt of LDCs is a serious one because they depend heavily on inflows of capital from abroad to finance their development needs. LDCs being poor countries, their rates of domestic savings and investment are low. They woefully lack in economic and social overhead capital and basic and key industries. To accelerate the rate of economic development, they borrow to import capital goods, components, raw materials, technical know-how, etc. Besides, they also borrow to finance consumer goods to meet the requirements of the growing population. Their exports being limited to a few primary products, they borrow to supplement and increase their domestic resources. These lead to huge current account balance of payments (BOP) deficits. A current account BOP deficit means that the country is borrowing from abroad. To finance its BOP deficit, the LDC borrows by selling bonds abroad, from commercial banks abroad, from international financial institutions like the IMF, World Bank, IFC, etc., and from private foreign firms. In all such cases, the country accumulates external debt which it has to repay abroad in the future in the form of interest and principal.

THE DEBT CRISIS

The oil shocks of the 1970s and the reactions of the developed countries to them led to a major debt crisis in LDCs. To repay these debts in the form of interest and capital caused serious problems in such economies. The problem had become very severe by the early 1980s which led to increase in debt-service payments from $ 18 billion in 1973 to $ 140 billion in 1990. Consequently, many LDCs found it difficult to service their debts and it was feared they would default on payment thereby leading to an international crisis.

CAUSES OF THE DEBT CRISIS

The following have been the causes of the international debt crisis:

1. Oil-Price Shocks. The principal cause of the international debt crisis of the 1970s and 1980s was the increase in oil prices in 1973 and 1979. The first oil shock to the international economy was an increase in oil prices by more than four-fold and the second doubled them. This caused a large increase in the import bills of non-oil producing LDCs. Simultaneously, their export earnings fell due the recession in the developed countries. Consequently, the current account BOP deficit of oil importing LDCs increased much. Their ratio of debt to GNP rose from 15.4% in 1974 to 37.6% in 1986.

2. Bad Macro-economic Management. To cope with the problem of BOP deficit, the LDCs began macro-economic management of their economies. They continued to expand their expenditures to meet demand for their economic development. This led them to adopt expansionary fiscal and monetary measures and to large borrowings from abroad. This resulted in inflation and external debt. As the Bretton Woods System of fixed exchange rates had collapsed in 1973, the LDCs adopted new exchange rate strategies like the crawling peg and managed floating in order to avoid *real* appreciation of their currencies in the face of rising inflation. They aimed at a declining rate of depreciation against the dollar. For this, they adopted trade reform measures to boost exports, and encouraged the inflow of private capital through international banks. These further increased their external debt.

3. Policies of Developed Countries and their Banks. The policies adopted by the developed countries and their banks were instrumental in creating the debt crisis. The rise in oil prices had increased the revenues of oil exporting countries. But they were unable to absorb them within their economies. They deposited large volumes of “petro-dollars” in the commercial banks of the developed countries. Thus these banks had accumulated huge funds which could not be used by the developed countries, as the latter were faced with recession. But the LDCs needed funds for their economic development programmes which these banks “recycled” in the form of loans to LDCs.

4. Rising Interest Rates. The increase in interest rates also added to the debt crisis. During the first oil-price hike, the real interest rates were low and even negative in the developed countries due to inflation. This reduced the real burden of the debt of LDCs. But the second oil shock increased both money

and real interest rates between 1979-82. The rise in oil prices led to inflation in the developed countries which adopted restrictive monetary policies to control inflation. This resulted in a sharp increase in money and real interest rates. Consequently, the costs of servicing the past debts and of new debts increased for LDCs. The costs of debt service was made worse by the growing proportion of debt at variable interest rates in the form of loans from commercial banks belonging to developed countries. For instance, the ratio of debt service to exports of all developing countries increased from 13.2% in 1980 to 25.9% in 1986.

5. Trade Policies. Trade related policies of both LDCs and developed countries also led to the growth of external debt of LDCs. The LDCs followed the inward-oriented import-substitution industrialisation till the 1970s. This policy brought initial gains but ultimately led to inefficiencies in the production of manufactured goods. Agricultural and primary production activities were neglected. The two oil-price hikes which led to recessions in the developed countries and the increase in non-tariff restrictions by the latter led to reduction in exports and export prices of LDCs. During 1981-86, they suffered an annual average loss of $ 8 billion due to reduction in their export earnings. With the fall in the prices of their primary commodities, the terms of trade of LDCs also deteriorated. The cumulative loss suffered due to this by them was $ 95 billion during this period.

6. Immediate Cause. After 1979, many LDCs had accumulated huge external debts which they found it difficult to repay in the form of interest and principal. This led to the international debt crisis of the 1980s. The crisis emerged in August 1982 when the Mexican Central Bank announced that it had run out of foreign exchange reserves and that it could not pay its foreign debt of $ 80 billion. Fearing that Argentina, Brazil and Chile might not follow Mexico, the lender-banks of developed countries started refusing new loans and demanded repayments of earlier loans from these and other Latin American countries. This trend spread to African and some East Asian LDCs. By the end of 1986 more than 40 countries were engulfed by the debt crisis.

MEASURE TO SOLVE THE DEBT CRISIS

LDCs have been receiving loans from the official world agencies like the IMF

and World Bank, from banks and from individual countries on bilateral basis. Therefore, there cannot be any clear-cut solution to their debt repayment problems. It has to be on a piece-meal and case-by-case basis. Further, these need to be reinformed by domestic monetary and fiscal measures to solve it. We discuss below the various measures that have been suggested and adopted from time to time.

1. Twin-Track IMF Strategy. The IMF feared that any default by LDCs to repay the debt would threaten the stability of the international bank system in the wake of Mexico's refusal to honour its debt obligations in August 1982. It, therefore, suggested a twin-track strategy so that the LDCs could repay their loans in full. According to this strategy, it would continue to give direct financial assistance to provide time to grow out of their debt problems; and *second*, to encourage structural adjustment programmes in them to increase their debt service capacity in the long-run.

Since the Fund had about $ 120 billion available as per the quota subscriptions of the smallest LDCs, it sought the assistance of the international commercial banks to solve the debt crisis of the large LDCs. We explain these attempts as under :

2. Debt Rescheduling by Commercial Banks. When Mexico and other Latin American countries expressed their inability to service their debts, the international commercial banks devised ways to avert the Banking crisis. The creditor banks formed a Bank Advisory Committee (BAC), known as the London Club, to reschedule debts on case-by-case basis with individual debtor countries. It negotiates an agreement with a debtor country which involves rescheduling the debt for repayment within a number of months or years depending upon the capacity to repay and the size of the loan. But rescheduling depends upon the structural adjustment programme under the IMF's supervision.

In the beginning of 1983, the rescheduling of debt service was for a short period up to two years. This was called the *short-leash* approach which required repeated rescheduling of debts. So in 1984 Multi-Year Restructuring Agreements (MYRAs) were introduced which involved rescheduling of debts for longer periods up to 14 years.

This strategy of the IMF appeared to be successful throughout 1983 and 1984. But this forced or involuntary lending by the banks led to overdue payments to the outstanding debts of LDCs. These further weakened the balance sheets of the banks. So they started reducing their involuntary lending to LDCs.

3. The Baker Plan. To overcome this problem, the then US Treasury Secretary, James Baker proposed a scheme, known as the *Baker Plan* in October 1985 based on the Fund's twin-track approach. It provided for $ 20 billion of new loans by banks over 3 to 15 years and $ 9 billion of multilateral lending to the fifteen most heavily indebted LDCs. In return, these countries were to undertake growth-oriented structural adjustment programmes. But this Plan failed to meet the debt rescheduling requirements of these countries. Banks were reluctant to lend more to reduce their debts which were bound to increase further. They could judge the inability of these countries to repay even in the long-run. So additional loans fell much below the target of $ 20 billion. The debtor countries on their part found the IMF adjustment programmes difficult and painful in carrying out and abandoned them. So Baker Plan failed to solve their debt probelm.

4. The Brady Plan. In 1989, the new US Treasury Secretary Nicholas Brady proposed measures for *debt reduction* of LDCs. There were three main elements of the Brady Plan : *First*, it asked the IMF and World Bank to provide funds to debtor countries for repaying debts to banks. But the debtor countries were to carry out growth oriented adjustment programmes laid down by the Fund and World Bank. *Second*, it urged banks to accept repayment of less than the full amount of the debt so as to include debt service reductions and debt forgiveness. *Third*, it called on the governments of developed countries to amend their banking legislations to provide for debt forgiveness in their bank accounting rules. The Brady Plan has been successful to some extent. Such agreements have been negotiated between banks and debtor countries to buy back their debts at a discount rate ranging between 44 and 84 per cent. The largest agreement has been with Mexico involving $ 49 billion of debt which was rescheduled.

5. Debt Swaps. Another solution to the debt probelm of LDCs has been to exchange the debt by what is known as "debt swaps". Many banks have entered into agreements with debtor countries to reduce the burden of debt repayments through a number of options such as debt-for-debt swaps, debt-for-equity

swaps, debt-for-cash swaps, debt-for-nature swaps, debt-for-development swaps, debt-for-export swaps and debt-to-local-debt swaps (*i.e.* external debt converted into local currency). Between 1985-92, debt swaps of various types amounting to $ 90 billion were agreed upon between banks and debt countries.

6. Rescheduling of Official Loans. The developed lender countries, which give loans to LDCs are called the *Paris Club*. The Paris Club decides about the reschedul-ing of official loans, lays down their dates and time of repayment in consultation with the IMF. The LDC debtor countries approached the Paris Club for rescheduling the loans provided by its members many times between 1982 and 1987.

In 1982, emergency financing was made available through the Bank for International Settlements (BIS). In January 1982, the IMF established an emergency fund under the General Agreement to Borrow (GAB) amounting to SDR $ 17 billion.

7. Toronto Terms. At the 1988 Toronto Economic Summit of the Paris Club, it was decided to give debt relief to the poorest debtor countries with GNP per capita income of less than $ 600. Under the Toronto Terms, the concessional debt (with low interest rate) could be repaid over 25 years with 14 years' grace. For non-concessional debt, there were three options : (1) Repayment in 25 years with 14 years' grace at market interest rates; (2) repayment in 14 years with 8 years' grace at concessional interest rates; and (3) repayment in 14 years with 8 years' grace at market interest rates and simultaneously cancelling 1/3rd of debt.

8. The Houston Terms. The Paris Club introduced the Houston Terms in 1990 for the lower-middle-income debtor countries. Their repayment of debts was spread over 20 years with 10 years' grace at market interest rates.

9. Enhanced Toranto Terms. In 1991, the Paris Club amended the Toronto Terms for the severely indebted low-income countries. It offered the alternative of cancelling 50 per cent of a country's debt and rescheduling the remaining over 23 years with 6 years' grace or rescheduling it at concessional interest rates where the debt-service ratio exceeded 25 per cent. Eighteen countries of Africa and two of Latin America had taken advantage of the Toronto Terms in rescheduling their debts by the 1991.

In addition to the Toronto and Houston Terms, a number of creditor countries have been concelling debts of their own.

Conclusion. The various proposals for debt rescheduling discussed above have not been very successful because they are dependent upon the private international banks to carry them out. The majority of them are unwilling to take such measures which may adversely affect their balance sheets. These proposals do not solve the debt problem of LDCs permanently but for a short period with the result that it will again reappear.

LONG-TERM SUGGESTIONS

To solve the debt problem of LDCs over the long-run, there is need for concerted efforts on triple fronts. On the part of : (*a*) the IMF, (*b*) the developed countries, and (*c*) the LDCs. We discuss them as under :

(a) IMF Solutions. The IMF insists on the debtor LDCs to adopt market-oriented adjustment programmes for availing financial help from it. These include: (1) Tight monetary and fiscal policies so as to reduce budget deficits, through cut in government spending, reduction in interest rates and in inflation; (2) encouraging foreign investment by abolishing controls both internal and external and giving greater incentives to foreigners; and (3) devaluing the currency to encourage more exports and greater competition through a more open trade policy.

But the adoption of such policies by LDCs has brought about the Asian Crisis. It has led to more unemployment and poverty and reduced their growth rates. There has been capital flight and worsening of their BOP problem. Instead of reduction in their debts, they have increased them. These measures have led to public riots and even to the fall of governments in many Asian and Latin American countries.

(b) Measures by Developed Countries. Since the developed countries are the creditors of LDCs, *First*, they should provide development assistance to the poor LDCs as grants rather than loans. *Second*, they should wave a major portion of their debts to LDCs. *Third*, they should establish a fund which should provide guarantee to private loans by corporations and banks of developed countries in case of default. *Fourth*, a large portion of the debt of LDCs is due

to fall in their export prices and hence in their terms of trade. The developed countries should adopted appropriate measures to overcome price fluctuations in their primary products through the creation of international buffer stocks, commodity agreements, compensatory financing, etc.

The above noted measures will go a long way in solving the debt problem of LDCs.

(c) Measures by the Debtor LDCs. LDCs, on their part, should adopt the following measures which may help in reducing their debts; (1) to strengthen and develop infrastructural facilities so as to encourage foreign investment; (2) to reduce imports through trade restrictions within the provisions of the WTO; (3) to produce more quality products for domestic consumption as well as for exports of all kinds. Greater diversification in quality products for domestic use and exports is essential to face foreign competition both in domestic and global markets; and (4) Monetary and fiscal policies should be in keeping with the overall objective of growth with stability so that the country becomes self-sufficient and there is little need for external debt.

CHAPTER

New International Economic Order (NIEO)

ORIGIN

The demand for a New International Economic Order (NIEO) by developing countries goes back to the first session of the UNCTAD in 1964. The various resolutions adopted in the subsequent sessions of the UNCTAD contain a systematic account of the various elements of an NIEO. At the root of the call for an NIEO lies the dissatisfaction of LDCs with regard to trading, financial, technological and other policies pursued by the developed countries towards the LDCs. The developed countries have oppressed the LDCs, discriminated against them, drained their income and denied them access to advanced technology. Such policies have obstructed their development efforts, perpetuated inequalities in wealth and incomes and increased unemployment and poverty in them. But there were three phenomena that gave an immediate impetus to the demand for an NIEO in the early 1970s. They were : (*a*) a severe energy crisis; (*b*) the breakdown of the Bretton Woods System in 1973; (*c*) the disappointment with development aid which was much below the UN target of 0.7% of GNP of developed countries; (*d*) the formation of the OPEC (Organisation of Petroleum Exporting Countries) in 1973 and its success in raising oil prices; and (*e*) the existence of unusual high rates of inflation and unemployment in LDCs.

Specific proposals for an NIEO were put forward at the Summit Conference of Non-Aligned Nations held in Algiers in September 1973. The success of OPEC led the developing countries to call the Sixth Session of the UN General Assembly in April 1974. This session adopted, without a vote, a declaration and a Programme of Action on the Establishment of New International Economic Order “based on equity, sovereign equality, interdependence, common interest and cooperation among all states, irrespective of their

economic and social systems which shall correct inequalities and redress existing injustices, make it possible to eliminate the widening gap between the developed and the developing countries and ensure steadily accelerating economic and social development and peace and justice for present and future generations." In December 1974, the UN General Assembly approved the "Charter of Economic Rights and Duties of States". All these three Resolutions constitute the documents of NIEO.

OBJECTIVES (OR FEATURES) OF NIEO

The following are the most important objectives of an NIEO based on the proposals of the UN Resolutions :

1. International Trade. The NIEO lays emphasis on a greater role of LDCs in international trade by adopting the following measures which aim at improving the terms of trade of LDCs and to remove their chronic trade deficits: (*i*) establishment of LDC sovereignty over natural and especially mineral resources for export; (*ii*) promoting the processing of raw materials for exports; (*iii*) increase in the relative prices of the exports of LDCs through integrated programme for commodities, compensatory financing, establishment of international buffer stocks and creation of a common fund to finance stocks, and formation of producers' associations; (*iv*) providing proper framework for stabilising prices of raw materials and primary products so as to stabilise export income earnings; (*v*) indexation of LDC export prices to rising import prices of manufactured exports of developed countries; (*vi*) increase in the production of manufactured goods; and (*vii*) improved access to markets in developed countries through progressive removal of tariff and non-tariff barriers and restrictive trade practices.

2. Technology Transfer. The NIEO proposals stress the establishment of mechanism for the transfer of technology to LDCs based on the needs and conditions prevalent in them. In this context, particular emphasis is on the : (*i*) establishment of a legally binding international code regulating technology transfers; (*ii*) establishment of fair terms and prices for the licensing and sale of technology; (*iii*) expansion of assistance to LDCs in research and development of technologies and in creation of indigenous technology; and (*iv*) adoption of commercial practices governing transfer of technology to the

requirements of LDCs.

3. Regulation and Control of the Activities of MNCs. The NIEO declaration also emphasises on the formulation, adoption and implementation of an international code of conduct for MNCs (multinational or transnational corporations) based on the following : (*i*) to regulate their activities in host countries so as to remove restrictive business practices in LDCs; (*ii*) to bring about assistance, transfer of technology and management skills to LDCs on equitable and favourable terms; (*iii*) to regulate the repatriation of their profits; (*iv*) to promote reinvestment of their profits in LDCs.

4. Reforming the International Monetary System and Special Aid Programme. The NIEO declaration proposes to reform the international monetary system on the following lines : (*i*) elimination of instability in the international monetary system due to uncertainty of the exchange rates; (*ii*) maintenance of the real value of the currency reserves of LDCs as a result of inflation and exchange rate depreciation; (*iii*) full and effective participation by LDCs in the decisions of the IMF and the World Bank; (*iv*) linkage of development aid with the creation of additional SDRs; (*v*) attainment of the target of 0.7% of GNP of developed countries for development assistance to LDCs; (*vi*) debt re-negotiation on a case-by-case basis with a view to concluding agreements on debt-cancellation, moratorium or rescheduling; (*vii*) deferred payments for all or parts of essential products; (*viii*) commodity assistance, including food aid, on a grant basis without adversely affecting the exports of LDCs; (*ix*) long-term suppliers' credit on easy terms; (*x*) long-term financial assistance on concessionary terms; (*xi*) provision on more favourable terms of capital goods and technical assistance to accelerate the industrialisation of LDCs; and (*xii*) investment in industrial and development projects on favourable terms.

5. Interdependence and Cooperation. Above all, the NIEO declaration lays emphasis on more efficient and equitable management of interdependence of the world economy. It brings into sharp focus the realisation that there is close interrelationship and interdependence between the prosperity of developed countries and the growth and development of LDCs. For this, there is need to create an external economic environment conducive to accelerated social and economic development of LDCs. Further, it requires the strengthening of mutual economic, trade, financial and technical cooperation among LDCs,

mainly on preferential basis.

IMPLEMENTATION OF NIEO PROGRAMME

LDCs have been striving hard to get the NIEO programme implemented at the various international fora in cooperation with the developed countries. But they have been successful in only limited fields.

1. Trade. In the package of proposals to readjust international trade, no wothwhile progress has been made. The implementation of integrated programme for commodities (IPCs) has been extremely slow. The principal element of this programme is the creation of a Common Fund for financing international buffer stocks. After several years of negotiations at the various UNCTAD meetings, a Common Fund for commodities of $ 4.7 billion has been created with a total pledged capital of 66.9 per cent at the UNCTAD VII in 1987, allowing it to become operational. Whether this Fund will succeed in providing adequate price support to commodities of LDCs in markets dominated by developed countries is highly uncertain.

As regards international commodity agreements, the NIEO proposals relate to 18 commodities, ten of which were to be initially included in the buffer stock scheme. Of these, five agreements on coffee, cocoa, sugar, tin and rubber were negotiated. But only the agreement on rubber is still in operation.

Little has been done in providing a suitable framework for stabilising prices of raw materials, and processed primary products to stabilise the export earnings of LDCs. Similarly, no steps have been taken up to implement the proposal of indexation of export prices of LDCs to rising import prices of manufactured goods of developed countries.

No doubt, exports of manufactured goods from LDCs have increased rapidly, yet their share in world trade is still very small. The developed countries have agreed to give tariff preferences on the manufactured and semi-manufactured goods of LDCs under GSP (Generalised System of Preferences). GSP schemes are in operation in 29 preference-giving countries including the 15 members of the EC.

So far as tariff cuts on primary and other products from LDCs are concerned,

there are apparently no significant barriers to trade after the Uruguay Rounds. Products of LDCs enter the developed countries duty free under MFN (Most Favoured Nation). But in the case of many agricultural products of LDCs which compete with those of developed countries, tariff reductions have been nominal. Developed countries which produce agricultural products have been resorting to subsidisation of their products, while others place restrictions on imports from LDCs. Developed countries have devised new trade restrictions on the products of LDCs such as VER (Voluntary Export Restraint), OMA (Orderly Marketing Agreements), low-cost suppliers, market disruption, etc. Moreover, in the garb of non-technical barriers to trade like environmental, health and sanitary conditions, the developed countries are restricting the exports of LDCs.

As regards non-tariff barriers, agreements have been reached under the GATT Rules for codes on subsidies, countervailing duties, customs valuation, technical barriers to trade, etc. But LDCs are being discriminated under the "escape clauses" and "safeguard rules".

2. Transfer of Technology. In the area of technology transfer, UNCTAD-IV at Nairobi in 1976 approved a policy paper on the Code of Conduct on Transfer of Technology. The draft code prohibits restricted business practices. There are clauses forbidding LDCs which are the recipients of a particular technology to manufacture export-oriented goods, to introduce on its own changes in that technology, to apply it for purposes other than those specified in the agreement, etc. Such clauses prohibit the use of technologies in their own interests. The policy paper renounces the practice of transferring technology in the form of "single packages" of plants, equipments, materials and managerial services, etc. It also provides criteria for determining "just prices" of technologies.

Subsequent UNCTAD meetings have been simply passing resolutions for the adoption of this policy paper with slight modifications which have been rejected by LDCs. Even the setting up of an ad hoc working group relating to "Investment and Technology Transfer" at UNCTAD-VIII in 1992 has failed to come out with a code of conduct acceptable to LDCs. UNCTAD-IX in 1996 also urged to the developed countries to give LDCs access to high technology crucial to their development. But no progress has been made to evolve a code of conduct for technology transfer by the developed countries. However, an

agreement was reached in 1979 for the establishment of a UN Financing System for Science and Technology for Development. To begin with, an Interim Fund had been proposed to supplement the financial resources of LDCs. But nothing has materialised so far.

3. MNCs. The only significant development in the case of MNCs has been the efforts made by the UN Commission on Transnational Corporations in drawing up a code of conduct for the operations of MNCs. It sets out comprehensive standards of behaviour of these corporations and of their treatment by home and host governments. Besides, negotiations have been going on the code of conduct for technology transfer for establishing a general and universal legal framework for transfer and development of scientific and technological capabilities of LDCs.

4. International Monetary System and Development Aid. After the collapse of the Bretton Woods System, the present international monetary system has not failed to protect the interests of LDCs. The excessive reliance on market forces coupled with excessive exchange rate fluctuations have been responsible for financial crises in some Asian and Latin American developing countries. The IMF has failed to increase the allocation of SDRs with the result that the volume of international liquidity does not meet the requirements of LDCs. The only positive gain has been the 10th and 11th quota reviews enlarging the IMF's quotas to SDR $ 212 billion. The establishment of *Emergency Structural Adjustment Loans* in early 1999 to help the Asian and Latin American countries inflicted with the financial crisis, and *Contingency Credit Line* in April 1999 to protect other LDCs from the contagion of crisis are welcome measures by the IMF. Despite these, the management of international monetary system by the IMF, World Bank and its affiliates continues to be guided by ad hocism.

Over the years, the various UNCTAD meetings have failed to solve the problems of debt and development aid to LDCs. At best, they have been fora for exchanging ideas and passing resolutions rather than getting issues solved. As regards the flow of official development assistance to LDCs by developed countries, it continues to be nearly half of 0.7% of their GNP target. The IMF and the World Bank have been trying to solve the debt problem of LDCs but with little success because of the paucity of funds with them and strict conditionalities. However, some European banks have been rescheduling debts

and a few governments have started debt cancellations. The emphasis continues on tied aid or programme assistance. Several donor countries continue to use aid increasingly as an instrument of promoting their exports to LDCs.

5. Interdependence and Cooperation. The first step towards economic cooperation among LDCs was taken at the Ministerial meeting of G-77 held at New York in October 1982 when it decided to launch the Global System of Tariff Preferences (GSTP). GSTP is a major initiative undertaken in 1987 by developing countries to expand mutual trade through grant of tariff and non-tariff concessions and other measures. This is being achieved by the ASIAN, SAARC and NAFTA countries.

Besides increasing trade, UNCTAD-VI recommended the initiation or strengthening of a number of cooperative measures in the fields of research and development, design and engineering among LDCs. The possibilities of cooperation for technological transfer among LDCs exist for particularly the following four sectors : capital goods, human skills, energy, and food production and processing. The developing countries are helping the least developed countries in these areas.

It also proposed a simpler payments unechanism under a *common clearing system.* This is another area which provides considerable encouragement to cooperation among LDCs. Further, the developed countries insist that the existing international institutions like the IMF and World Bank should be strengthened financially so that they may provide larger aid to LDCs to tide over their balance of payments and debt problems. But the LDCs call for the setting up of a new financial institution which should exclusively cater to their special financial requirements in fields such as joint ventures, development projects, export credit, commodity price stabilisation, and regional payments support, and long-term investment to expand trade in food and primary products, and for storage, processing and transport. So far no progress has been made in this direction.

UNCTAD-VIII set up a new Standing Committee on Economic Cooperation among developing countries to study report on all facets of co-operation. But nothing has come out of it.

There are many factors which stand in the way of economic cooperation

among the LDCs. The economies of LDCs are highly competitive in nature. They have limited import capacity, inadequate credit facilities, chronic foreign exchange shortage, and prejudice against the goods traded among themselves. Consequently, they prefer to trade with developed countries even though goods manufactured by LDCs are cheaper and of high quality. However, some LDCs suffer from other limitations which prevent them from entering into trade with other LDCs. These are technological backwardness, shortage of key inputs, high cost of production, lack of competitive strength, and weak marketing structure. The various problems listed above can be overcome by mutual help and trust among LDCs of a region and working in close cooperation among themselves.

CONCLUSION

Besides the lack of economic cooperation among the LDCs, the developed countries have explicitly and implicitly tried to oppose NIEO programmes. This is apparent from the “trade” and “escape” clauses, phasing out of concessions to LDCs and other agreements forced upon LDCs under the GATT Rules and WTO Agreement at the Uruguay Round. To overcome the opposition of developed countries, LDCs require greater unity and solidarity and broader use of all types of cooperation in their struggle for NIEO at all international fora.

CHAPTER

Commercial Policy and Economic Development

MEANING

Commercial policy plays an important part in the economic development of an LDC. Commercial policy may be defined as one that helps in accelerating the rate of economic development: (*a*) by enabling the underdeveloped country to have a larger share of the gains from trade; (*b*) by augmenting the rate of capital formation; (*c*) by promoting industrialization; and (*d*) by maintaining equilibrium in the balance of payments.

ARGUMENTS FOR AND AGAINST

Various arguments have been put forth in support of such a commercial policy which inevitably aims at the adoption of protection:

1. The Terms of Trade Argument. The increase in the gains from trade of an underdeveloped country is based on the terms of trade argument. A shift in the terms of trade in favour of an underdeveloped country is tantamount to an increase in its national income. If a country imposes a tariff that brings about a fall in import prices or a rise in export prices, it will result in improving its terms of trade. This will naturally help in financing economic development. For, its income will increase and it will be in a position to import larger quantities of capital goods.

Its Limitations. On the face of it, this argument sounds logical, but it is not without certain reservations.

First, an improvement in the terms of trade will have little relevance to capital formation, if the increased income is not saved but dissipated on domestic and

imported goods. Mere saving is not enough. What is required is its investment in capital goods.

Second, for such a tariff policy to be successful, the tariff imposing country should have sufficient monopoly or monopoly power. But this is not possible unless the underdeveloped countries act as a united economic group. In reality, such a policy is impracticable because of the small size of the domestic market for an importable commodity, and the ability of the developed countries to develop local substitutes for the natural products of such countries.

Third, a tariff policy of this type is effective only if the "foreign-offer curve" is inelastic. But in the case of underdeveloped countries, the foreign-offer curve is usually elastic. As a result, they supply less exports and demand less imports as the price of imports rise. The higher is this elasticity, the greater will be the fall in the volume of trade as a result of the imposition of tariff. These price elasticities of supply and demand act as one of the important limitations to the terms of trade argument.

However, discounting all these limitations, "it is likely that the gain from trade would be only a short-term gain which would be eliminated quickly by retaliatory measures by other countries, changes in elasticities or by changes in the government's "expenditures of customs revenue or an internal redistribution of income."[1]

2. The Saving Ratio Argument. One of the principal sources of capital formation is an increase in the tempo of investment by stepping up domestic savings. Domestic savings can be stepped up by restricting the importation of consumer goods through direct controls or prohibitive duties. The consumption expenditure is thereby reduced which is equivalent to an increase in savings. This increase in savings is, in turn, utilized for importing capital goods. Thus for capital formation, the necessary condition is that a reduction in the import of consumer goods must be followed by an increase in the imports of capital goods of the same value.

Its Limitations. But this argument is also not free from limitations.

First, if the import restrictions do not result in reducing consumers' expenditure, but lead to a shift of expenditure from imported to domestic

consumption goods, the demand for the latter goods will rise in relation to their supply and there will be an inflationary pressure on prices and costs. As Nurkse puts it aptly, "When the escape value of consumable imports is shut off, the pressure of the steam in the system increases, demand becomes excessive in relation to domestic supply and tends to push up the level of prices."[2]

Second, the increase in home consumption will also occur at the cost of home investment because increased consumption draws domestic factors away from capital construction or maintenance. Leaving aside an increase in voluntary savings, capital formation can, however, take place by purchasing imported capital goods through forced saving that results from inflation.

Third, if the import restrictions on luxury consumption goods are not accompanied by similar restrictions on the domestic production of these goods, domestic savings will be sucked into non-essential channels. Thus the "economy surrenders through the back-door what it secures by the front-door." It cannot be denied that economic growth does take place in this way, but it takes a needlessly painful and contorted form.

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1. Meier and Baldwin, *op. cit.*, p. 404. Italics mine.

2. *Ibid.*, p. 112.

Fourth, this argument assumes that a policy of import restriction on consumption goods does not affect exports adversely. If import restrictions are placed to protect domestic import-competing industries they are likely to attract resources away from the export industries. Then the exports will be adversely affected. It is also possible that the incentive to peasants to produce the exportable crops may be dampened by the denial of imported consumption goods.

Fifth, a policy of import restrictions leading to an increase in domestic costs and prices may have an unhealthy effect on exports. Thus Nurkse observes: "The simple idea that more capital can be got for the country merely by pinching and twisting the foreign trade sector is an instance of the fallacy of misplaced concreteness."[3]

3. The Foreign Investment Argument. Protection also acts as a source of

capital formation by attracting direct foreign investment in the underdeveloped country. One of the methods is the setting up of tariff factories in the tariff imposing country by the foreign manufacturer in order to escape the import controls. The foreign manufacturer may set up a branch or subsidiary of his firm alone or in collaboration with local enterprise behind the tariff wall when the finished products are prohibited while raw materials and necessary parts are permitted duty free. Some of the foreign industrial investment in India, in recent years, has been of this type. But the main obstacle in the flow of direct foreign capital has been the small size of the domestic market for the restricted imports in the underdeveloped countries. A wide domestic market acts as a big incentive in attracting foreign capital. As Nurkse puts it bluntly: "Tariff protection, if it can help at all, can only help the strong, it cannot help the weak."[4]

4. The Infant Industry Argument. The famous Listian "infant industry" argument in favour of protection gives enough inducement to underdeveloped countries in accelerating their pace of industrialization. There are some industries which can be fruitfully developed in underdeveloped countries provided they are protected from foreign competition. In the present, their costs of production may be more due to the lack of certain basic facilities, but in due course of time, after the initial difficulties are overcome, their products would cost less. The future fruits of industrialization would more than compensate for the sacrifice undergone in the form of higher prices in the present. Thus the argument is that "infant" industries need protection from foreign competition till they attain adulthood. The period between infancy and adulthood is generally characterized by a transition from the agricultural to the industrial stage. Myrdal has assigned "four special reasons for industrial protection in underdeveloped countries—the difficulties of finding demand to match new supply, the existence of surplus labour, the large rewards of individual investments in creating external economies, and the lop-sided internal price structure disfavouring industry."[5] These reasons are interrelated and provide an "infant economy" case for protection to an underdeveloped country.

Its Limitations. But it has its limitations too.

First, according to Nurkse, infant industry protection alone is an ineffective

instrument of promoting economic development because it overlooks the problem of capital supply.

Second, infant industry protection should not be given before the industry has been actually set up. As Nurkse said, "Infant creation must take precedence over infant protection."

Third, tariff protection cannot create or increase the supply of capital required by the infant industry. If can, however, make a contribution on the demand side by increasing the inducement to invest in the protected industry. But this argument is confined only to creating demand for import-substitutes.

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3. *Ibid*., p. 115.

4. *Ibid*., p. 106.

5. G. Myrdal, *An International Economy*, p. 279

Fourth, it is also doubtful whether the stress on import-substitutes will be enough to lead to a balanced growth of the economy. For, without an overall growth of the economy, investment in the import-competing industries will be very small. Nurkse cautions that too much reliance on import restrictions should be avoided because the import-substitutes produced at home are costly and tend to reduce real income.[6]

Fifth, given that the infant industry has been created, it must satisfy a number of conditions for the policy of protection to be successful. It is essential that the industry would not develop without the help of protection and that eventually it would be able to stand on its own legs when protection could be removed. Above all, it should acquire enough skill and experience to produce at low costs. It implies that though in the initial stages there may be losses, yet in future the industry should be in a position to realize sufficient saving in costs.

Sixth, it is also difficult to decide the amount and the period of protection to be given to the infant industry. For making these decisions Dr. Lakdawala stresses, "It is necessary not only to know and forecast the domestic demand and supply conditions but also those of the rest of the world. An error of judgement may prove costly, as the possibilities of reversal are limited. Once a protected industry comes into existence, even if it does not grow out of its infancy, it has

to be borne with, especially in countries where the employment problem presents concern. To minimize the chances of failure, it is necessary not only to insist on a competent impartial enquiry as a prior condition, but also the government has to act as watchdog to ensure the full efficiency and productivity of protected industries." *Seventh*, assuming that these requirements have been satisfied, the right selection of infant industries is somewhat uncertain because it is difficult to forecast changes in costs and the extent of external economies in future. It is, therefore, advisable to impose a uniform ad valorem duty on all the manufactured products, rather than heavy selective duties in order to encourage the development of particular industries.[7]

5. External Economies Argument. Another argument for protection is that the establishment and development of every new industry yields benefits in the form of external economies. These external economies result in a divergence between private profit and social benefit. And when such divergence arises, a case can be made for import restrictions or subsidization in order to lessen this divergence. Scitovsky[8] maintains that the concept of external economies in the context of industrialization of underdeveloped countries is used in connection with the social problem of allocating savings among alternative investment opportunities.

External economies are generally classified as "technological'' and "pecuniary" external economies. They arise because of direct interdependence among the producers. "Technological external economies exist whenever the output of a firm depends not only on the factors of production utilized by this firm but also on the output and factor utilization of another firm or group of firms."[9] These "technological external economies" affect the firm's output through changes in its production function. According to Scitovsky, "Pecuniary external economies are invoked whenever the profits of one producer are affected by the actions of other producers." He explains further that with an expansion in the capacity of an industry as a result of investment, prices of its products fall and the prices of the factors used by it rise. The lowering of product prices benefits their consumers and the rising of factor benefits their suppliers. When these benefits accrue to firms in the form of profits, they are pecuniary external economies.[10]

Its Limitations. The external economies argument has the following limitations:

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6. Nurkse, *op. cit.*, pp. 105-08.

7. D.T. Lakdawala, "Commercial Policy and Economic Growth" in Trade Theory and Commercial Policy in Relation to Underdeveloped Countries, (ed.) A.K. Dass Gupta p. 31, n, 5.

8. Tibor Scitovsky, "Two Concepts of External Economies" in Aggarwal and Singh (ed.) *op. cit.*, pp. 295-303.

9. J.E. Meade, "External Economies and Diseconomies in a Competitive Situation.' Economic Journal, March 1952.

10. Scitovsky, op. cit.

First, if production costs of firms in other industries are lowered as a result of expansion in the capacity of the protected industry, due to emergence of technical or pecuniary external economies, 'the private profitability understates its social desirability in this situation.' As a result, the production of commodities will be less than optimal. In other words, investment decisions will be less than optimal, if investment in the protected industry increases the profitability of an another industry. Thus protection granted to a range of complementary industries is socially more profitable whereas in the case of isolated industries, it might be less profitable. As Scitovsky emphasises, "Only if expansion in industries were integrated and planned together, would the profitability of investment in each one of them be a reliable index of social desirability?"[11]

Second, Myrdal is of the view that greater external economies are realizable in the export as well as the import-competing industries.[12] *Third*, in reality, one must count only the net external economies—the external economies minus diseconomies—accruing to domestic nationals and leave out of account the pecuniary external economies accruing to foreign buyers from the expansion of export industries and the diseconomies inflicted on foreign competitors by the expansion of import competing industries. Accordingly, investment in export industries, concludes Scitovsky, is always less and that in import competing industries, is always more desirable from the national point of view.

6. Factor Re-distribution Argument. It is contended that in an under

developed country the gap in prices and costs between agriculture and industry is so wide that it hampers the development of industry. This view was first of all put forth by M. Manoilesco[13] who advocated protection for industry since industry was more productive than agriculture. Lewis[14] and Myrdal have restated the argument in recent years.

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11. *Ibid.*

12. *Ibid*., p 227.

13. M.Manoilesco, *Theory of Protection and International Trade*, 1931.

14. W.A. Lewis, in Aggarwal and Singh, *op. cit.*

In overpopulated underdeveloped countries, the money wages of labour in industry exceed the social cost of labour in alternative uses. Due to the existence of the extended family system and underemployment in the rural areas, wages tend to be low in agriculture and high in industry. An underemployed or unemployed worker in the rural area will not be prepared to accept a job in the town unless the wages offered exceed his share of the family income. From the point of view of the society, the value of the worker's output is smaller than what he is prepared to accept in an alternative job in the town, since his marginal product is negligible or zero as he is underemployed or unemployed. Thus a policy of protecting industries is called for in order to compensate for this gap in money and social costs and also to provide viable employment opportunities for the surplus labour force. Myrdal states that in an under developed country the span between wages in manufacturing industry and in agriculture tends to be particularly broad. This will hamper industry if it is not given protection to a corresponding degree. Moreover, the social costs for labour in industry are actually lower than money costs. And protection will compensate for this gap in labour costs between agriculture and industry.[15] It is maintained that since agriculture is less productive than industry, real income can be raised by factor redistribution through a policy of protection.

Its Limitations. This argument is also not free from limitations.

First, this argument is not cogent when applied to the problem of disguised unemployment existing in underdeveloped countries. If a portion of surplus

working force (whose marginal productivity in agriculture is zero) is withdrawn from agriculture and gainfully employed in industry, it will raise the real income of the country. For this purpose industries are to be protected against foreign competition.

Second, we have already discussed the various aspects of the problem of 'disguised unemployment.' Given that disguised unemployment does exist, should protection be given in order to transfer surplus labour force from agriculture to industry? Nurkse's solution to this problem is not through industrialization but by employing surplus labour in capital projects. The problem is not one of protecting industry but of stimulating labour mobility by removing the various social and institutional barriers.

Third, this "superiority of industry" argument is, however, untenable in the context of economic growth. A country is poor not because of the agricultural bias of its economy but due to low agricultural productivity. In fact, for rapid economic growth agricultural development must keep pace with industrial development. Agricultural productivity should continue to increase in order to provide food to a growing population, to supply raw materials to expanding domestic industries, to earn more foreign exchange, and above all to accelerate the rate of capital formation. Too much emphasis on industry is, therefore, likely to adversely affect agriculture and exports. Thus primary production cannot be regarded as a cause of poverty. It is an associative characteristic of poverty, but not a causative characteristic.[16]

7. The Balance of Payments Argument. One of the principal objectives of commercial policy in an underdeveloped country is to prevent disequilibrium in the balance of payments. Such countries are prone to serious balance of payments difficulties to fulfil the planned targets of development. An imbalance is created between imports and exports which continues to widen as development gains momentum. This is due to increase in imports and decline in exports. To establish economic infrastructure like power, irrigation, transport projects, etc. and directly productive activities like iron and steel, cement, electricals, etc. underdeveloped countries have to import capital equipment, machinery, raw materials, spare's and components in large quantities, thereby raising the import content of their foreign trade.

Another cause of the rise in imports is the growing demand for foodgrains necessitated by a rapidly growing population. For instance, India had been importing on an average 3 million tonnes of foodgrains every year till a few years ago. So food imports are an important factor in creating an unfavourable balance of payments in underdeveloped countries.

Apart from foodgrains many essential consumer goods are imported to meet the domestic demand because it cannot be met adequately by indigenous production. This equally applies to capital equipment needed by the private sector of the economy.

Another important factor responsible for growing imports of such countries is the policy of import substitution. It requires the establishment of such industries within the economy which ultimately replace imports. This policy, in itself, necessitates the import of large quantities of machinery, capital equipment, spares, raw materials, etc., to set and operate such industries.

Almost all underdeveloped countries have emerged as independent nations after a long spell of colonial rule. They, therefore, prize their hardwon independence above everything. For this, they prepare themselves to ward off any external invasion and internal rebellion. This had led to heavy imports of defence equipments.

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15. *Ibid.*

16. Meier and Baldwin, *op. cit*, p. 400.

Another important cause of the balance of payments difficulties in such economies is inflation. As the economy moves on the path to development heavy investment expenditure flowing from deficit financing lead to strong inflationary pressures. Rise in domestic incomes, costs, and prices encourage imports and discourage exports. This makes the balance of payments position serious.

Further, balance of payments disequilibrium arises when a developing economy needs foreign exchange to service foreign borrowings. Such economies have to pay back the principal and interest on borrowings from the developed economies. Besides, they have to make payments for the services of

invisible items, i.e., transportation and insurance charges on imported goods. All these require larger foreign exchange which, being already scarce, accentuates the balance of payments position.

On the other hand, exports lag behind imports. Exports of underdeveloped countries lack variety and resilience. These countries produce primary products, mainly raw materials and agricultural commodities. Hence their markets are limited and highly competitive. Moreover, they are unable to export more on account of increased domestic consumption of exportable products due to rising income and increase in income elasticity of demand for consumer goods. Another problem is their high cost of production due to inflationary pressures. In the face of highly competitive international markets, high cost is a big hurdle to exports. Again, tariff barriers, quota restrictions and regional economic groupings also keep down the exports of underdeveloped countries. *Lastly*, bad quality of exportable goods and the absence of proper credit facilities to sell goods in foreign countries have been instrumental in keeping their exports low. Thus the above factors have tended to keep exports down and imports high thereby creating a perpetual problem of balance of payments in underdeveloped countries.

Measures to Overcome Balance of Payments Difficulties. The gap between imports and exports can be bridged by increasing exports and cutting down imports. For this purpose, complete government control over exports and imports is essential in order to push exports to the maximum and to cut down imports to the essential minimum. We discuss these two objectives in detail.

1. Export Promotion. Export promotion is indispensable for overcoming disequilibrium in the balance of payments. As a first step, comprehensive commodity surveys should be made in developed countries to determine potential markets. On the basis of these surveys, production of commodities with export potentialities should be increased. Exports of non-traditional items should be encouraged for they are needed both by the developing and developed countries. Myrdal observes in this connection that it is not in the interest of underdeveloped countries to continue with their traditional exports. He, therefore, suggests that “they should rather take good look at the composition of these exports and at their prospects in the world market and then make up their minds about which exports they should try to increase and which, exports they should rather leave alone or reduce. They should seek out

for themselves the dynamic commodities with using demand trends and with high income and price elasticities and try to get away from those with a doubtful future."[17]

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17. G. Myrdal, op. cit., p. 854.

This policy, in turn, necessitates the adoption of the following measures:

(*i*) An essential precondition for the fulfilment of the export programme is the realization of the production targets set in the agricultural mineral and industrial sectors of the economy;

(*ii*) Restraining the growth of domestic consumption of commodities through fiscal or other measures in order to create adequate export surplus;

(*iii*) Maintenance of reasonable internal price stability;

(*iv*) Modernisation of export-oriented industries;

(*v*) Timely import of raw materials and capital equipments needed for the production of exportable goods and even supplying them at subsidized prices;

(*vi*) Relaxation or removal of export restrictions on exportable goods;

(*vii*) Provision of credit, insurance and transport facilities to exporters. In India, credit facilities to exporters are provided by the Reserve Bank of India, the State Bank of India, and the Refinance Corporation. Besides, there is the Export Credit and Guarantee Corporation which insures all export risks, furnishes guarantees to banks on behalf of the exporters for credit facilities and provides supplementary credit facilities for export promotion. While the Indian Railways provide cheap and preferential transport facilities;

(*viii*) Tax concessions to exporters using imported raw materials, semi-processed goods or components in the manufacture of exportable commodities;

(*ix*) Stabilisation of prices of exportable goods;

(*x*) Measures for the introduction and enforcement of quality control and compulsory preshipment inspection of various exportable commodities. In India, the Export Inspection Council performs these twin functions;

(*xi*) Establishment of a commercial intelligence service for the compilation and dissemination of information to guide exporters and foreign importing firms;

(*xii*) Establishment of a trading company to represent business interests of exporters in foreign countries having branches in key centres of the world;

(*xiii*) Promotion and participation in industrial and trade fairs abroad and to arrange visual commercial publicity for the purpose of export promotion;

(*xiv*) Setting up export promotion councils for major export goods. In India there are Export Promotion Councils in the case of major exportable commodities which perform both advisory and executive functions. They have been set up to secure the active cooperation of growers, producers and exporters in the country's drive for export promotion. Some of the councils have opened regional centres at important places in India and abroad;

(*xv*) Conclusion of bilateral trade agreements with developed countries;

(*xvi*) Cooperation among developing countries in the sphere of foreign trade. Since most of the underdeveloped countries export almost similar types of products, they enter into competition with one another which is detrimental to them.

Nurkse, Myrdal and others have, therefore, suggested cooperation among them in the field of international trade. It may be cooperation in a particular region or the creation of a common market among countries of the same character. This is the only way to boost up the trade of underdeveloped countries by increasing their bargaining strength in the world market. "The Say's Law of Market, so to say, will have a wider application among various countries of the underdeveloped region than within one country itself. The supply of one country would meet the demand in the other, and vice versa."[18]

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18. M.S. Khan, *India's Economic Development and International Economic Relations*, 2nd ed.

2. Import Substitution. Another important method to overcome the balance of payments difficulties has been the import substitution. The strategy is to cut down import of consumer goods and produce them at home. As Myrdal has pointed out, "The danger on the foreign exchange front provides a reason for directing investments in industry towards production of commodities that are substitutes for imports."[19] According to Hirschman, there are four impulses of import substituting industrialization. They are the balance of payments difficulties, wars, gradual growth of income, and deliberate development policy. The first leads to a bias in favour of non-essential industries and the last is likely to produce exactly the opposite bias. The two motivating forces of industrialization by import substitution in developing countries have been balance of payments difficulties and deliberate development policy. The measures which are adopted in pursuance of these two impulses are import duties, quotas and import of exchange surcharges and multiple exchange rates as price-protective devices, while tax exemptions and subsidies are used to reduce costs in import-competing industries. Import substitution necessarily begins with the manufacture of durable consumer goods at the final stages of production. The country imports many converting, assembling and mixing plants and turns out finished consumer goods that were previously imported and then moves on, more or less rapidly and successfully, to the higher stages of production—to intermediate goods and machinery through backward linkage effects.[20]

Case for Import Substitution. The case for import substitution rests on the grounds that trade had operated historically as a mechanism of international inequality to the disadvantage of backward countries. They are, therefore, justified in adopting the strategy of industrialization by import substitution for the purpose of achieving self-sufficiency in the long run and to save foreign exchange by substituting imports by home production.

The experience of advanced countries is also cited in support of import substitution. H.B. Chenery has shown on the basis of historical studies of some countries that not only the share of industrial output rises with development, but also the growth of industries based on import substitution accounts for a large production of the total rise in industrial production.[21]

One of the principal arguments for the policy of import substitution is that it

avoids the uncertainties and risks involved in finding markets for the import substitution industries because when the imports are shut off, an already established market is secured for the new industries.

Another argument is based on the contention that the demand of a developing country for industrial imports increases much more rapidly than the foreign demand for its exports. Such countries export primary products which have a sluggish foreign demand and are therefore unable to import industrial products sufficiently in exchange for exports. Thus the need arises for producing industrial goods at home to meet the domestic demand.

Again, it is argued that import-substituting industrialization augments the rate of domestic savings and investment. When the state uses restrictive devices like tariffs, licences, quotas, etc., to protect import-substituting industries from foreign competition, the producers are able to raise the prices of their products and thus earn high profits. When these profits are saved and reinvested, development gains momentum. Moreover, it is argued that protection to import substitution industries will turn the terms of trade against the unprotected sectors and thus change the distribution of income in such a manner that savings and investment are encouraged in the economy.

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19. G. Myrdal, op. cit.

20. A.O. Hirschman, "The Political Economy of Import Substituting Industrialization in Latin America." *QJE*, February, 1968.

21. H.B Chenery, "Patterns of Industrial Growth", *AERL*, September, 1960.

Further, there is the employment argument in support of industrialization by import substitution. It is contended that import-substituting industrialization is necessary to provide gainful employment to the existing underemployed, to absorb surplus manpower arising from increase in agricultural productivity through the use of modern labour-saving techniques and to engage the growing labour force as population increases.

Another argument for import-substituting industrialization is from the point of view of the economic welfare of the underdeveloped country in the long run. If the policy of import-substitution is carried through, substantial amounts of direct foreign investments, as is usually the case, the country benefits from

modern industrial techniques and know-how. By directly participating in the technological know-how of the advanced countries, it is in a position to accelerate its rate of capital accumulation.

Lastly, the ultimate aim of industrialization via import substitution is two-fold:

(i) to achieve self-sufficiency in the production of finished consumer goods, intermediate goods and machinery; and

(ii) to export them to developing and developed countries.

Case Against Import Substitution. The policy of import substitution being followed in India, Pakistan and in many Latin American countries has not been smooth. Rather, it has tended to disrupt the economies of underdeveloped countries thereby making their process of industrialization a costly one. Santiago Macario, a Latin American economist, writes in this connection that anxiety to relieve the chronic shortage of foreign exchange has induced many Latin American countries to pursue an industrialization policy essentially geared to import substitution; and that the substitution process has not been effected gradually, in accordance with a plan, and in anticipation of development requirements but in makeshift fashion, frequently to meet emergencies, and on the basis of excessive and indiscriminate protection. Consequently, in many instances it has been carried a good deal beyond the economically advisable limits, with the result that serious distortions have been introduced in the economic structure in the countries concerned and the development of more efficient and productive activities has been adversely affected to the special detriment of export possibilities.[22] These observations equally apply to India, as will be shown later. We discuss arguments against import substitution in the light of merits of this policy as given above:

The principal objective of the policy of import substitution aimed at saving foreign exchange has been frustrated. The industries established have not been those that might have saved foreign exchange. In fact, the established industries have failed to produce any real savings, rather they have resulted in dissaving of foreign exchange. Underdeveloped countries lack in raw materials, intermediate goods and capital equipment to start import substitution industries. So the need for imports is much greater in this policy than otherwise. Thus, the direct savings of foreign exchange may be less than the

indirect expenditure of foreign exchange on inputs and capital goods needed for import substitution industries. It may even lead to dissavings because the value of the inputs imported for the new industries may far exceed the value of goods replaced by domestic production.

The historical evidence adduced by Chenery in support of industrialization via import substitution may not hold good in the case of all the developing countries. It is contended that the rise in industrial production has taken place through the growth of imports. The import of raw materials, intermediate goods and capital equipment help in the establishment of the domestic industry in an underdeveloped country. In fact, the imports help in using the underemployed resources productively, in creating demand, and in encouraging entrepreneurial activities within the economy. It is the imports which ultimately pave the way for the establishment of import substituting industries by creating a base for them.

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22. S. Macario, "Protectionism and Industrialization in Latin America," Economic Bulletin for Latin America, March, 1965.

The argument that import substitution industrialization is essential to meet the domestic demand for industrial goods secured by shutting off imports overlooks the need for larger imports. According to Prof. Hirschman, "The bulk of new industries in developing countries are in the consumer goods sector and as they are undertaken in accordance with known processes, on the basis of imported inputs and machines, industrialization via import substitution becomes a 'highly sequential', or 'tightly staged', affair."[23] The policy of import substitution thus creates demand for a variety of imports and defeats the purpose for which it is adopted. Moreover, the tendency for import substitution to create demand for further imports has important consequences.

(*i*) instead of reducing, it increases the economy's dependence on imports.

(*ii*) sometimes the economy may be unable to import raw materials, capital equipment and spares due to shortage of foreign exchange or its insufficient allocation to imported materials and spares. Consequently, this leads to under-utilization of manufacturing capacity resulting in work stoppages, unemployment and fall in income.

(*iii*) import substitution has a tendency to shift the distribution of income in favour of the urban sector and the higher income groups, whose expenditure pattern typically has the highest component of imports which tends to increase further the demand for imports. Thus the extension of import substitution to a wider range of goods generates or increases the demand for further imports with bad effects on the economy.

John Power has argued that import substitution of finished consumer goods tends to lower rather than raise domestic savings and investment. The stress on the production of consumer goods for domestic use tends to raise their consumption and thus penalise exports and backward-linkage import substitution. Such a policy leads to adverse effects on economic and technical efficiency thereby reducing income, profits and saving. John Power, therefore, advocates investment in capital goods and export sectors rather than into the consumer goods sector to augment the rates of national income, saving and investment for further growth.[24]

The argument that the establishment of import-substituting industries tends to absorb surplus labour in underdeveloped countries has not been borne out by facts. *Firstly,* There is no denying the fact that import substitution expands output in the manufacturing sector but it has failed to create jobs for growing labour force in such countries. Griffin and Eros have shown that the growth of employment in manufacturing is not in the least comparable to the growth in output. In fact, employment seldom increases unless manufacturing output is growing by about 4 per cent per annum. *Secondly*, industrial employment grows less rapidly than the population.[25] For instance, over the period 1960-70 the average annual growth rate of output in Chile was 5.5 per cent while the growth rate of employment was 1.4 per cent. Similar was the case with Philippines where the growth rate of employment was only 2.1 per cent as against 6.7 per cent in output. This proves that industrialization via import substitution fails to create jobs so as to absorb redundant labour.

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23. *Ibid*.

24. J. Power, "Import Substitution as an Industrialization Strategy," *Philippines Economic Journal*, Vol. V, no. 2, 1966.

25. Planning Development, 1970.

Further, the use of the strategy of import substitution as a means to achieve self-sufficiency in industrial production has led to malallocation of resources and a very bad effect on industrial productivity. In their enthusiasm to attain self-sufficiency, underdeveloped countries have resorted to indiscriminate protection for the development of inefficient and low priority industries. As a result, raw materials, intermediate goods and equipment obtained at a high cost have been misused. Thus such a policy has led to the establishment of inefficient industries with high production costs under extreme protection. This has been the experience of India in the field of import substitution. According to V. V. Desai, the self-sufficiency goal led to the impression that whatever substituted imports good for the economy. As a result, substantial amounts of spare resources were used up. in the production of such commodities as could be considered low priority consumption items. He estimated that the growth of such non-essential production resulted in the loss of potential savings to the tune of about Rs. 800 crores during 1954-55 and 1963-64'[26] Further, this resulted in inadequate planning of the industrial structure and systematic under-estimation of the foreign exchange requirements of the programme for import substitution. It also resulted in the need for foreign exchange exceeding availability, thereby forcing many industries to operate below capacity. He concludes that the misdirection of substantial investment into low priority industries and the ever growing foreign exchange requirements have failed to achieve the goal of self-sufficiency in the industrial sector through import substitution.[27] The same story has been repeated in the majority of Latin American countries.

Besides, according to Raul Prebisch,[28] excessive protectionism in such economies has generally insulated national markets from external competitions. This has tended to weaken and even destroy the incentive to improve the quality of their products and to lower costs. High cost of production has necessitated recourse to excessive protectionism. This has, in turn, adversely affected the industrial structure because it has encouraged the establishment of small uneconomic units, weakened the incentive to introduce modern techniques, and slowed down the rise in productivity. Thus a vicious circle has been created as regards exports of manufactured goods. These exports encounter great difficulties because internal costs are high because, among other reasons, the exports which would enlarge the markets are lacking.

Thus import-substituting industrialization has failed to encourage exports of developing countries.

Conclusion. In conclusion, it seems that the policy of import substitution has failed to conserve foreign exchange. However, in certain cases it has intensified the shortage. The emphasis on import substitution on consumer goods has not been successful in increasing real output, saving and investment. It has failed to bring the economy anywhere near the goal of self-sufficiency in industrial production. Neither has it succeeded in creating sufficient employment opportunities to absorb the growing labour force, nor has there been the progressive growth of the export sector.

But countries like India which have established industries for the manufacture of sophisticated machinery and equipment have achieved significant progress in import substitution. It has helped the country lay reasonably good foundation for self-reliance in respect of the future investment programmes and defence capability. There has been spectacular achievement in respect of basic industries like iron and steel, crude petroleum and products, fertilisers, heavy chemicals, aluminium and a variety of machinery, besides a number of durable consumer goods like bicycles, fans, sewing machines which the country also exports. India now produces about three-fourths of the capital equipment required for its development programmes through the policy of import substitution.

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26. V.V. Desai, "Import Substitution and Growth of Consumer Industries," *Economic and Political Weekly*, 15 March, 1969.

27. V.V. Desai, "Pursuit of Industrial Self-sufficiency," *Economic and Political Weekly*, 1 May, 1971 and "Neglect of Implications of Self-sufficiency Goal," *Ibid*., July, 1971.

28. Raul Prebisch, *Towards a New Trade Policy for Development*, 1964.

EXPORT PROMOTION VS. IMPORT SUBSTITUTION

A pertinent question is: as between export promotion and import substitution which policy should be adopted by an underdeveloped country? Both policies have one common aim, i.e., to overcome balance of payments difficulties. We have discussed above the disadvantages of the policy of import substitution. Instead of saving foreign exchange, it has tended to increase the demand for

imported machinery, parts and equipments. Extreme protection has led to the establishment of inefficient units with high production costs and sub-standard products thereby acting as severe handicaps for the growth of exports. The country is thus required to pay heavy price for industrialization via import substitution. Therefore, the policy of export promotion is called for. But "import substitution can be an effective instrument provided it can be done without creating over-protected, inefficient and high-cost industries. On the other hand, an economy which lays stress on export development is likely to create conditions favourable for efficient production, because sustained growth of exports, involving international competition, calls for greater cost and quality consciousn"[29] For the purposes of discussion, let us divide the developing countries into two categories: (i) countries not suffering from acute population pressures; and (ii) overpopulated countries.

Countries in the first category should try to maintain and expand their traditional exports. They should make improvement in primary production by using more capital and better technology. They should replace such imports the production of which absorbs more labour relatively to capital. The process of import replacements should be gradual and in collaboration with foreign enterprises.

On the other hand, overpopulated countries like India should concentrate on manufactured products both for home consumption and export. This is essential because the markets for traditional exports of India like tea, jute manufactures, and cotton textiles have become either stagnant or have been expanding very slowly. Expenditure elasticity of demand for commodities like tea being constant, their exports are not likely to expand. Commodities like jute manufactures are losing their foreign market due to the development of synthetic materials. Even the market for cotton textiles is shrinking because of the development of man-made fibres like terylene. Another reason is stiff competition among the developing countries because every new country starts with cotton textile industry. Keeping these factors in view, it is imperative for developing countries to promote the export of those durable consumer goods which are in great demand in the developed countries. Such commodities are cars, scooters, tape recorders, air-conditioners, refrigerators, TVs, cameras etc. The classical example is of Japan which has captured the Australian, New Zealand, American, and Canadian markets despite stiff competition from the

domestic producers of these commodities. But the greatest handicap in this field for developing countries like India is high cost of production and low quality. So, for the purpose of developing the markets for such non-traditional items, developing economies should adopt export promotion measures enumerated in the earlier page.

But the export of non-traditional items to the developed countries are beset with strong protective barriers which the developing countries will have to overcome. In this context, Harrod's advice merits consideration. He writes, "whatever the policies of the mature countries, developing countries should aim at expanding their output of exportable manufactures at prices so competitive as to be able to surmount the protective barriers of those countries."[30] The argument requires simultaneous establishment of intermediate goods and machirtery industries which are dependent on the economies of scale. This refers to industrialization via import substitution in an intensive manner. Thus a developing country like India should combine the export promotion policy with intensive import substitution to overcome balance of payment difficulties and accelerate the pace of development.

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29. Pitambar Pant, "No Room for Complacence in Export Promotion." *Yojana*, 31 May, 1970.

CONCLUSION

Regulation of foreign trade is the fundamental principal of commercial policy. For, without a strict regulation of its foreign trade, an underdeveloped country cannot proceed on the road to economic development. Protection then becomes a necessity in order to increase the rate of capital formation, promote industrialization, and remove balance of payments disequilibrium. Opinions, however, differ whether underdeveloped countries should follow a restricted or a liberal trade policy. Myrdal is of the view that import restrictions in underdeveloped countries are simply a shift of import demands for some commodities to others and generally to goods needed for economic development. They do not imply a diminution of total imports. Their import restrictions and export subsidies do not, therefore, decrease total world trade.[31] At another place he is more explicit when he says that the advice underdeveloped countries are now often gratutiously given to abstain from

interfering with foreign trade is tantamount to giving up their development policy. A strict regulation of their foreign trade is a necessity but these regulations will not generally decrease world trade. He further believes that the underdeveloped countries have rational grounds for asking the developed countries to liberalise their trade unilaterally. They need to be staunch free traders, but preserve for themselves the right to give export subsidies and restrict imports. And they have valid agruments against anyone who could call this attitude of theirs logically inconsistent.[32]

Another view is held by Meier and Baldwin who argue that protective commercial policy will interfere with the optimum pattern of world trade and may lead to uneconomic productive practices and inhibit the flow of foreign capital. A liberal trade policy, on the other hand, can be a vital force in determining the rate at which a country develops. Thus an underdeveloped country foregoing the benefits of international trade may only be perpetuating its poverty.[33] This argument is based upon the presumption that the adoption of a policy of protection necessarily paves the way to autarchy. But a well devised protective policy leads to fuller utilization of idle resources so as to expand and diversify the economy, ultimately leading to the expansion of foreign trade.

If, however, an underdeveloped country were to choose between economic development and foreign trade, it will always choose the former. And commercial policy appears to be the easiest way to accelerate economic development. As Nurkse has said, "When it is a matter of stimulating employment, shutting off imports is a very simple method. When the problem is to collect taxes for the government revenue, tariffs are not difficult to establish and have been very popular in the less developed countries. When protection is wanted for infant industries restricting imports is again easier than raising funds with which to pay direct subsidies to the protected industries. Commercial policy is the line of least resistance in these cases, not the most effective or equitable line. Similarly, commercial policy is easier than keeping domestic consumer demand in check by measures of, say, fiscal policy, but it does not go to the root of the problem. It is perhaps the best that can be done; the root of the problem may be insoluble."[34]

30. R. Harrod, “Economic Development and Asian Regional Cooperation,” *Development Review, Spring*. 1962.

31. Ibid., p. 283.

32. G. Myrdal, *Economic Theory and Underdeveloped Regions*, pp. 94-97.

33. Ibid., p. 409.

34. Nurkse, *op. cit.*, pp. 118-19.

CHAPTER

WTO and Developing Countries

INTRODUCTION

The Uruguay Round of GATT negotiations concluded on April 15, 1994 at Marrakesh, Morocco. India, alongwith 123 Ministers besides the EC countries signed the Final Act incorporating the Eighth round of multilateral trade negotiations. The Final Act consists of : (1) the WTO Agreement which covers the formation of the organisation and the rules governing its working; and (2) the Ministerial decisions and declarations which contain the important agreements covering trade in goods, services, intellectual property and plurilateral trade. They also contain the dispute settlement rules and trade policy review system. The WTO Agreement is in fact the Uruguay Round agreements whereby the original GATT is now a part of the WTO Agreement which came into force from January 1, 1995.

THE WTO

The WTO is the successor to the GATT. The GATT was a forum where the member countries met from time to time to discuss and solve world trade problems. But the WTO is a properly established permanent world trade organisation. It has a legal status and enjoys privileges and immunities on the same footing as the IMF and the World Bank. It includes : (1) the GATT, as modified by the Uruguay Round; (2) all agreements and arrangements concluded under the GATT; and (3) the complete results of the Uruguay Round.

There were 77 member countries of the WTO on January 1, 1995. Now there are 151 members. India is one of the founder members.

ITS OBJECTIVES

In its Preamble, the Agreement establishing the WTO lays down the following objectives of the WTO:

1. Its relations in the field of trade and economic endeavour shall be conducted with a view to raising standards of living, ensuring full employment and large and steadily growing volume of real income and effective demand, and expanding the production and trade in goods and services.

2. To allow for the optimal use of the world's resources in accordance with the objectives of sustainable development, seeking both (*a*) to protect and preserve the environment, and (*b*) to enhance the means for doing so in a manner consistent with respective needs and concerns at different levels of economic development.

3. To make positive efforts designed to ensure that developing countries, especially the least developed among them, secure a share in the growth in international trade commensurate with the needs of their economic development.

4. To achieve these objectives by entering into reciprocal and mutually advantageous arrangements directed towards substantial reduction of tariffs and other barriers to trade and the elimination of discriminatory treatment in international trade relations.

5. To develop an integrated, more viable and durable multilateral trading system encompassing the GATT, the results of past liberalisation efforts, and all the results of the Uruguay Round of multilateral trade negotiations.

6. To ensure linkages between trade policies, environmental policies and sustainable development.

ITS FUNCTIONS

The following are the functions of the WTO:

1. It facilitates the implementation, administration and operation of the objectives of the Agreement and of the Multilateral Trade Agreements.

2. It provides the framework for the implementation, administration and operation of the Plurilateral Trade Agreements relating to trade in civil aircraft, government procurement, trade in dairy products and bovine meat.

3. It provides the forum for negotiations among its members concerning their multilateral trade relations in matters relating to the agreements and framework for the implemenation of the results of such negotiations, as decided by the Ministerial Conference.

4. It administers the Understanding on Rules and Procedures governing the Settlement of Disputes of the Agreement.

5. It co-operates with the IMF and the World Bank and its affiliated agencies with a view to achieving greater coherence in global economic policy-making.

WTO AGREEMENT

The Agreement establishing the WTO consists of the following which embody the results of the Uruguay Round of the Multilateral Trade Negotiations:

1. Multilateral Agreements on Trade in Goods : GATT Rules 1994.

2. General Agreements on Trade in Services.

3. Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs).

4. Understanding on Rules and Procedures governing the Settlement of Disputes.

5. Plurilateral Trade Agreements.

6. Trade Policy Review Mechanism.

WTO AND DEVELOPING COUNTRIES

The *first* Ministerial Meeting of the WTO was held at Suntec City in December 1996 at Singapore. The ministers of member countries adopted a consensus declaration reaffirming their faith in the multilateral trading system as the

means to promote free world trade. In the declaration, they renewed their commitment to : (1) a fair, equitable and more open rule-based system; (2) progressive liberalisation and elimination of tariff and non-tariff barriers to trade in goods; (3) progressive liberalisation of trade in services; (4) rejection of all forms of protectionism; (5) elimination of discriminatory treatment in international trade relations; (6) integration of developing and least developed countries and economies in transition into the multilateral system; and (7) the maximum possible level of transparency.

The Ministers discussed some new issues of trade such as competition policy, labour standards, multilateral investment agreement and government procurement. In their declaration, they rejected the use of labour standards for protectionist purpose, agreed to establish separate working groups to examine the relationship between trade and investment, to study issues pertaining to the interaction between trade and competition, including anti-competitive practices, and to conduct a study on transparency in government procurement practices. They admitted that progress in negotiations on liberalising world markets in financial services, maritime services and basic telecommunications had been unsatisfactory which would be completed by the end of 1997.

The only positive side of the Meeting was the launching of the Information Technology Agreement signed by 28 countries which aims at slashing tariffs on items of information technology to zero by the year 2000.

The *first* Ministerial Meeting was severely criticised for the manner in which its decisions were arrived at. There was a facade of consensus because most developing countries were marginalised in the decision-making process.

The *second* Ministerial Conference was held at Geneva where the developed nations made a commitment to reduce subsidies and trade distorting support in agriculture. Provision was made for special safeguard mechanism for the developing world and the concept of food security for them was accepted. The Conference also approved the Information Technology Agreement.

The *third*, Ministerial Conference was held at Seattle (US) in November-December 1999. The Conference was marred by many controversies between the developed and developing countries. A large number of member countries emphasised on a new round of negotiations, called the Millennium Round,

covering a wide range of subjects like investment issues, competition policy, transparency in government procurement, trade facilitations, trade and labour standards, trade and environment, industrial tariff reduction, etc. The inclusion of non-trade issues like labour standards in the WTO agenda was vehemently opposed by the developing countries. The Conference failed due to large disagreements among the groups of developed and developing countries on certain disputed issues like textiles, agriculture and anti-dumping. As no concensus based conclusions could be reached on most of the issues, the Conference failed to kick off a new round of trade talks.

THE DOHA ROUND

The *fourth* round of trade negotiations under the WTO kicked off at Doha (Qatar) in November 2001. At the Conference, labour standards were removed from the core agenta of WTO. The main agenda of the Conference was to reduce global trade bariers covering agriculture, industrial goods and services largely for the benefit of developing and poor nations. But the Doha Development Round of trade talks slumped into dead lock with a dead line of 1 January 2005.

At the *fifth* Conference held at Cancun (Mexico) in September 2003, nothing specific came out of the negotiations. The meet failed because of disagreement on farm subsidies.

This was followed by a July 2004 meeting of WTO members to identify critical issues of international trade that formed the basis for negotiations at the next meet at Hongkong in December 2005.

At the WTO meet held at Hongkong in December 2005, 110 developing countries emerged as a powerful group against US, EU and other developed nations to fight for common interests of both the least developed and deveoping countries. Consequently, negotiations on the Doha Round collapsed in July 2006. Since then negotiations have been going on at Geneva to arrive at a concensus on the latest draft texts on four main issues relating to Agriculture. Non-agricultureal Market Access (NAMA), Services and Rules.

These issues are :

1. Trade in Agriculture. Developed Countries subidise their agriculture more than developing countries. Farm subsidies are of two types : *first*, financial subsidies that support farmers to keep their domestic prices low compared with international prices. *Second,* export subsidies to encourage sales of farm produce abroad. Lower prices make their farm products more attractive in the global markets and make it difficult for developing countries to compete with them. The developing countries wanted farm export subsidies to be phased out and domestic subsidies on farm products to be reduced. But US and EU refused to do so without equivalent access in manufacturing markets in developing countries. Developing countries like India and Brazil were willing to do so but not before US and EU cut their subsidies. India, on its part, argued that she had already cut specific tariffs from 55 per cent to zero. Brazil had to some extent also cut specific tarifs on cotton, sugar, soyabean, etc. Finally, both EU and US agreed to phase out all export subsidies by 2013, and phaseout 80 per cent of the subsidies by 2010.

To protect their farmers from a surge of cheap imports from developed countries, developing countries demanded special permission not to cut import duties on certain products on which a large number of marginal and small farmers depended. They also sought special safeguards to raise import duties on select products if their imports surge beyond a certain level.

Regarding the concensus on agriculture, there are still large number of issues on which there are disagreement while others are within known bounds or sequare brackets, and are still to be decided. For example, greater market access to the markets of developed countries for the goods of the developing countries and the issue of non-tariff barriers to agricultural trade, including phyto-sanitary conditions, and environmental issues.

2. Non-Agricultural Market Access (NAMA). Under NAMA, both developed and developing countries were to agree on a formula in order to reduce tariffs on such industrial goods as auto, consumer electronics, textiles, footwear, etc. The developed countries suggested the Swiss Formula which required the highest duty cuts in items with the highest tariff. This favoured the developed countries who viewed the rapidly growing middle class in developing countries as a profitable market for their industrial products. The developing countries did not agreee to the Swiss Formula which was modified with lesser duty cuts. Still there was no concensus and the trade talks were suspended in

July 2006.

3. Trade in Services. Trade in services is growing very fast and is the most competitive globally. WTO provides for four modes for trade in services. The *first* is cross-border services negotiations. Developing countries like India have not been able to get a binding commitment under this. The Hong Kong Declaration talks of only "guidance" and not of any specific guidelines. The *second* mode is a plurilateral route to open markets for services. In this route, a few countries having common interests negtotiate at a multilateral level to open their services sector. The *third* mode is the request and the *fourth* is the offer route. In the former route, countries make individual requests and in the latter route, they offer the services of their professionals. The last requires an economic test for the movement of professionals to other counries. The Hong Kong Declaration eased the need for this test. On the objection of some developing countries, the plurilateral route clause had been diluted.

The Doha Round after July 2006. After the suspension of Doha Round talks in July 2006, the Secretariat of WTO prepared three new draft negotiating texts and released them in February 2008. The trade ministers of India, Brazil, US, EU, Japan and Australia met in New Delhi in April 2008 to review and discuss the latest draft texts on the three main issues holding up the progress in the Doha Round negotiations.

The US accepted WTO proposals on farm subsidy cuts as a basis for negotiations. Until now, US had refused to accept a ceiling below $23 billion a year, whereas the WTO compromise proposal suggested a limit of $ 12.8 to $16.2 billion a year on its farm subsidies. The main concern of developing nations is on Special Products and Special Safeguard Mechanism (SSM) for agricultural products. The Special Products are designed to allow developing countries to impose higher duties on their vulnerable products that affect the livelihoods of subsistence farmers and the food security of a nation, while SSM is designed to protect farmers from sudden import surges and price falls by applying an additional safeguard duty over and above the bound rate. The draft text proposed to allow member states to raise import duties only if the world prices are lower than domestic prices by over 30%. A price trigger of 30% was unacceptable to developing countries who suggested the price trigger at between 5% and 10%. Alongside, there were parallel proposals for cuts in import tariffs in a range of 19% to 23% on industrial goods by 28 developing

counries. But India and Brazil refused to go below 30% in order to protect their industrial growth.

So far as the new draft on NAMA was concerned, it was rejected by India and other developing countries. The text tried to use divided and rule policy among developing countries. It proposed a special set of rules for such countries as South Africa, Venezuela and Mexico that went against India and China.

There are two variables around which the negotiations had been going on. The first is the “coefficients” which mean the degree to which a country can reduce tariffs. A lower coefficient implies a higher cut in tariffs. The second is the “flexibilities” which mean the number of products being traded and the time frame over which the tariff cut will be done. The developing countries headed by India, sought flexibility to keep Special Products out of the duty cuts because such a flexibility will benefit them. These are agricultural products guided by indicators based on the criteria of food securtiy, livelihood security and rural development. By keeping, Special Products out of tariff reduction would help farmers in developing countries in protecting their important crops from unfair global competition.

The new draft suggested “sliding scale” which envisaged a trade-off not within the flexibilities themselves to protect sensitive sectors but between the coefficients and flexibilities. This meant that if a country required higher flexibility to safeguard its sensitive sectors, it would have to resort to a larger tariff reduction.

Another new suggestion was to use the “average percentage cuts” instead of the mandatory cut in peak tariffs and high tariffs on export products of developing countries. But developing countries believe that such a proposal would allow the developed countries to have high tariffs on the exports of the developing countries. Thus the revised draft and suggestions of WTO are not likely to be accepted by the developing countries because they want tariff peaks on products of their interest to come down which the developed countries are reluctant to negotiate at the Doha Round.

The new text on services trade required WTO members to make commitments to maintain current levels of market access and to create new market access.

However, there are minor differences over the trade in services between the developed and developing countries. The developing countries want increased market openings for their professionals in developed countries and the rationalisation of Rules text.

Conclusion. So far the Doha Round of trade negotiations have stalled with developing countries criticising farm subsidies in the developed countries and the developed countries arguing for lower tariff barriers for their industrial products and services and developing countries for their agricultural products. The trade talks held in Geneva collapsed on 30 July 2008 after India and other developing countries insisted that there should be enough scope to protect subsistence farmers and small industries from being submerged by a flood of cheap imports from the US and the EU.

CHAPTER

Foreign Capital and Aid in Economic Development

TYPES OF FOREIGN AID

Foreign aid (capital) enter a country in the form of private capital and/or public capital. Private foreign capital may take the form of direct and indirect investment.

Direct Investment means that the concerns of the investing country exercise *de facto* or *de jure* control over the assets created in the capital importing country by means of that investment. Direct investment may take many forms: the formation in the capital importing country of a subsidiary of a company of the investing country; the formation of a concern in which a company of the investing country has a majority holding; the formation in the capital importing country of a company financed exclusively by the present concern situated in the investing country; setting up a corporation in the investing country for the specific purpose of operating in the other concerns; or the creation of fixed assets in the other country by the nationals of the investing country. Such companies or concerns are known as transnational corporations (TNCs) or multinational corporations (MNCs).

Indirect Investment better known as ‘portfolio’ or ‘rentier’ investment consists mainly of the holdings of transferable securities (issued or guaranteed by the government of the capital importing country), shares or debentures by the nationals of some other country. Such holdings do not amount to a right to control the company. The share-holders are entitled to dividend only. In recent years, multilateral indirect investments have been evolved. The nationals of a country purchase the bonds of the World Bank floated for financing a particular project in some LDCs.

Public Foreign Capital may consist of: (*a*) 'Bilateral hard loans' *i.e.*, giving of loans by the British Government in pounds sterling to the Indian Government; (*b*) 'Bilateral soft loans' *i.e.*, sale of foodgrains and other farm products to India by the United States under PL 480*; (*c*) 'Multilateral loans' *i.e.*, contributions to the Aid India Club, the Colombo Plan, etc., by the member countries. Under this category are also included loans made available by the various agencies of the United Nations like IBRD, IFC, IDA, SUNFED, UNDP, etc[1]; (*d*) Inter-governmental grants.

Foreign Aid refers to public foreign capital on hard and soft terms, in cash or kind, and intergovernmental grants.

ROLE OF FOREIGN AID** IN ECONOMIC DEVELOPMENT

Public foreign capital is more important for accelerating economic development than private foreign capital. The financial needs of LDCs are so great that private foreign investment can only partially solve the problem of financing. For one thing, it has nothing to do with social expenditures in such spheres as education, public health, medical programmes, technical training and research, etc. Such schemes though indirectly contributing to economic efficiency and productivity of the economy in the long-run yield no direct returns, and could, therefore, be financed with the help of grants received from advanced countries. Further, private foreign investment presupposes the existence of basic public services in LDCs. But investment in them requires large sums and risks which private capital is unable to undertake. So investment in low-yielding and slow-yielding projects could be possible only on the basis of foreign aid. Moreover, unlike private foreign investment, aid can be used by the recipient country in accordance with its development programmes. Therefore, much cannot be expected of private foreign investment.

There is, however, a growing international awareness that "poverty anywhere is a danger to prosperity everywhere and prosperity anywhere must be shared everywhere." Developed countries consider it to be their moral duty to help their less fortunate brethren in underdeveloped countries. But this realization on the part of the developed countries has never been spontaneous. They have always been motivated by international policies in the context of the cold war.

Their aim has been to give aid with "strings" attached. "It was only with the entry of the Soviet Union and other communist countries into the field that Western countries also began displaying some enthusiasm for offering aid to the under-developed countries at the governmental level *without strings*."[2]

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* Under the US Agricultural Trade Development Assistance Act popularly known as Public Law 480, agricultural surpluses are sold for payment in local currency.

1. These abbreviations stand for: The International Bank for Reconstruction and Development (IBRD), International Finance Corporation (IFC). International Develop ment Association (IDA), Special United Nations Fund for Economic Development (SUNFED), United Nations Development Programme (UNDP).

** This also relates to the Role of Foreign Capital in Economic Development.

2. V.K.R. V. Rao and Dharam Narain, op. cit., p. 72. As a contrast, note what an American, economist says in this respect. Professor Kindleberger opines that the underdeveloped countries now have expectations of assistance in their development. The expectations-have been aroused. The United States, at least, among the developed countries, is committed to some form of economic assistance to the development programmes of the so-called free world. No such expectations have been awkened in the Soviet Union (after 1946) or in Red China." Ibid., pp. 298-99.

Foreign aid flows to the LDCs in the form of loans, assistance and outright grants from various governmental and international organizations. It is regarded indispensable for the development of LDCs. But there are some economists who dispute this view and hold that foreign aid is not indispensable for their development rather it obstructs it. We study the case for and against foreign aid.

CASE FOR FOREIGN AID

The following arguments are advanced for foreign aid in LDCs:

1. To Supplement Domestic Savings. LDCs are characterized as 'capital-poor' or 'low-saving and low-investing' economies. There is not only an extremely small capital stock but current rate of capital formation is also very low. On an average, gross investment is only 5 to 6 per cent of gross national income in these economies, whereas in advanced countries it is about 15 to 20 per cent. Such a low rate of savings is hardly enough to provide for a rapidly growing population at the rate of 2 to 2.5 per cent per annum, let alone invest in new capital projects. In fact, at the existing rate of savings, they can hardly cover

depreciation of capital and even replace existing capital equipment. Efforts to mobilise domestic savings through taxation and public borrowings are barely sufficient to raise the current rate of capital formation via investment. Rather, these measures lead to reduction in consumption standards, and unbearable hardships on the people. The importation of foreign capital helps reduce the shortage of domestic savings through the inflow of capital equipment and raw materials thereby raising the marginal rate of capital formation.

2. To Overcome Deficiency of Technological Backwardness. Besides, low-saving and low-investment imply capital deficiency, and along with it, LDCs suffer from technological backwardness. Technological backwardness is reflected in high average cost of production and low productivity of labour and capital due to unskilled labour and obsolete capital equipment. Above all, it is reflected in high capital-output ratio. Foreign capital overcomes not only capital deficiency but also technology backwardness. It brings sufficient physical and financial capital along with technical know-how, skilled personnel, organizational experience, market information, advanced production techniques, innovations in products, etc. It also trains local labour in new skills. All this accelerates economic development.

3. To Overcome Deficiency of Overhead Capital. LDCs woefully lack in economic overhead capital which directly facilitates more investment. The rails, roads, canals, and power projects provide the necessary infrastructure for development. But since they require very large capital investment and have long gestation periods, such countries are unable to undertake them without foreign aid.

4. To Establish Basic and Key Industries. Similarly, LDCs are not in a position to start basic and key industries by themselves. It is again through foreign capital that they can establish steel, machine tools, heavy electricals, and chemical plants, etc. Moreover, the use of foreign capital in one industry may encourage local enterprise by reducing costs in other industries which may lead to chain expansion of other related industries. Thus foreign capital helps in industrializing the economy.

5. To Exploit New Areas and Natural Resources. Private enterprise in LDCs is reluctant to undertake risky ventures, like the exploitation of untapped natural resources and the exploitation of new areas. Foreign aid assumes all

risks and losses that go with the pioneering stage. Thus it opens up inaccessible areas, taps new resources, and helps in augmenting the natural resources of the country, and removing regional imbalances.

6. To Obtain Social Benefits. As a corollary to what is indicated above, we may say that the creation of the country's infrastructure, the establishment of new industries, the tapping of new resources, the opening of new areas, all tend to increase employment opportunity within the economy. In other words, the importation of capital creates more employment in the urban sector. This leads to the migration of surplus labour from the rural to the urban sector. The pressure of population on land is reduced and disguised unemployment may disappear. This is the social gain from aid.

7. To Raise the Standard of Living. All this implies that foreign aid tends to raise the levels of national productivity, income and employment, which, in turn, lead to higher real wages for labour, lower prices for consumers and rise in their standard of living. When with the inflow of foreign capital, local labour becomes skilled, its marginal productivity is increased, thereby raising total real wages of labour. Secondly, when new industries are started by importing superior know-how, management, machines and equipment, larger quantities of new and quality products are available to consumers at lower prices.

8. To Increase State Revenues. When private foreign investors invest in various industries in LDCs, they get profits and royalties. The government of the capital-receiving country levies taxes on such profits and royalties which increase their revenues.

9. To Reduce Inflationary Pressures. The appearance of inflationary pressures is inevitable in a developing country because of the existence of the disequilibrium between demand and supply of domestic products, following the initiation of a large public investment programme. The latter has the impact of rapidly increasing the demand for goods and services relative to their supplies. This leads to inflationary pressures which become strong due to the existence of structural rigidities that inhibit the expansion of food and other consumer goods. Foreign aid helps minimise such inflationary pressures when food and other essential consumer goods through foreign aid raises the levels of consumption which, in turn, enhance the productive efficiency of the

community.

10. To Solve the Problem of Balance of Payments. Foreign aid overcomes the balance of payments difficulties experienced by an LDC in the process of development. To accelerate the rate of development it needs to import capital goods, components, raw materials, technical know-how, etc. Besides, its import requirement of foodgrains increase rapidly with population pressures. But its exports to developed countries are either stagnant or have a tendency to decline. The gap between imports and exports leads to the balance of payments difficulties. It is through foreign capital that an under-developed country can meet all its import requirements, and at the same time, avoid the balance of payments difficulties. Further, there is the need for additional foreign exchange for servicing external debt. This accentuates the balance of payments problems which can again be remedied by importing capital.

Conclusion. To conclude, the inflow of foreign capital is indispensable for accelerating economic development. It helps in industrialization, in building up economic overhead capital, and in creating larger employment opportunities. Foreign aid not only brings money and machines but also technical know-how. It opens up inaccessible areas and exploits untapped and new resources. Risks and losses in the pioneering stage also go with foreign capital. Further, it encourages local enterprise to collaborate with foreign experience. It obviates the balance of payments problem and minimises the inflationary pressures. Foreign aid helps in modernising society and strengthens both the private and public sectors. Foreign aid is thus indispensable for the economic development of LDCs.

CASE AGAINST FOREIGN AID

The following arguments are put forth against foreign aid in LDCs:

1. Foreign Aid is not a Necessary Condition for Development. Prof. Bauer is one of the few Western economists who does not view foreign aid indispensable for the economic development of LDCs. To him, “Foreign aid is plainly neither a generally necessary nor a sufficient condition for emergence from poverty.” It is not necessary for economic development because a number of new developed countries began as under-developed and developed without foreign aid. Moreover, many LDCs in the far East, South-East Asia,

East and West Africa, and Latin America have advanced very rapidly over the last half century or so without foreign aid. Nor is foreign aid a sufficient condition for economic development if the population of a country is not interested in material development. “But if the main springs of development are present, material progress will occur even with foreign aid. It is, of course, true that a country receiving aid benefits in the sense of obtaining cheap or free capital...., but this in no sense make foreign aid indispensable for development.”

2. Foreign Aid is Used for Wasteful Projects. Foreign aid is often used for extremely wasteful projects which make large losses year after year. They absorb more local resources of greater value than their net output when the costs of administration, maintenance and replacement of fixed assets originally donated for the projects are taken into consideration.

3. Foreign Aid does not Increase Net Investment. Foreign aid does not always bring about an increase in net investment. As a matter of fact, all LDCs receiving foreign aid impose severe restrictions on the inflow and use of foreign capital. These retard the operation and expansion of private enterprise within the economy. Consequently, both foreign and domestic private enterprises are forced to work below capacity. Thus, foreign aid may reduce rather than increase net investment within the recipient country.

4. Foreign Aid does not Improve Income Earning Capacity. Foreign aid has failed to improve the income-earning capacity of LDCs and they are now saddled with large external public debts.

5. Arguments to Overcome Balance of Payments Difficulties and to Avoid Inflationary Pressures are not Correct. The case for foreign aid to overcome balance of payments difficulties and to avoid inflationary pressures is mis-conceived. Foreign aid encourages governments of LDCs to embark on ambitious plans involving large expenditures financed by inflationary monetary and fiscal policies and also to run down their foreign exchange reserves. But inflationary policies, balance of payments difficulties and extensive economic controls engender a widespread feeling of insecurity or even a crisis atmosphere. All these inhibit domestic savings and investment and even lead to a flight of capital. These, in turn, serve as arguments for further foreign aid.

6. Influences Policies towards Inappropriate Directions. Foreign aid frequently influences policies into inappropriate directions by promoting unsuitable external models, such as Western-type universities whose graduates cannot get jobs, Western-Style trade unions which are only vehicles for the self-advancement of politicians, and a Western pattern of industry even where it is quite inappropriate such as airlines and steel plants.

7. Finances Uneconomic Enterprises or Activities. It is contended that foreign aid helps in increasing food, raw materials for exports and producing import substitutes. But the experience of many LDCs has been that much aid directly or indirectly finances uneconomic enterprises or activities which produce neither food nor raw materials for exports nor import substitutes.

8. Foreign Aid Politicises Public Life. Foreign aid often politicises public life in LDCs and thereby contributes to social and political tensions which ultimately retard material progress. It is on the basis of political pressures that many recipient governments in LDCs restrict the activities of highly productive and economically successful minorities such as Chinese in Indonesia, Asians in Africa, Indians in Burma, Europeans everywhere. Many maltreat and persecute politically ineffective minority groups, especially ethnic minorities. Such policies reduce current and prospective savings, investment and income in such LDCs.

9. Foreign Aid leads to Dependency. Foreign aid leads to dependency because the donors insist on aid-tying to the purchase of goods and services at costs much higher than the competitive world prices, and on monetary and fiscal policies detrimental to the national interests of the recipients of aid. For instance, the recipient may be required to keep an overvalued exchange rate, low real interest rates and to neglect export promotion and fiscal restraint.

10. Reduction in Domestic Savings. Griffin and Enos[3] have concluded on the basis of statistical evidence for thirty-two LDCs that only 25 per cent of foreign aid results in an increase of imports and investment, while 75 per cent is used for consumption. Thus aid causes a reduction in domestic savings. It is used as a substitute for domestic savings rather than as a supplement. Critics, however, doubt the validity of this statistical study because of statistical problems relating to sampling, too short a time period involved, non-

availability of savings data in LDCs, etc. Moreover, a number of exogenous factors like wars, weather, terms of trade, etc., and endogenous factors such as economic and political difficulties cause high inflow of aid and low-savings rates. It is, therefore, not possible to generalise the impact of foreign aid. Empirical evidence has shown that in some countries, aid stimulates savings so that each dollar of inflow results in more than one dollar of investment, while in some other countries they discourage savings and a dollar of aid inflow leads to much less than a dollar of investment.[4]

TIED VS. UNTIED AID

Distinction is often made between tied and untied aid. Aid may be tied by source, project and commodities, or it may be tied both by project and source, and become double tying aid. Untied aid is 'general-purpose aid' and is also known as programme aid or non-project aid. We discuss them in the light of Indian experience.

Tied Aid. Aid-tying by *source* is followed by the US Government in giving assistance under PL 480 and Exim Bank loans, and by Britain and Federal Republic of Germany. The US aid programme requires the recipients to spend the aid on US goods and services. All credits are automatically linked to US exports. Any departure from this tying by source means discontinuance of aid. Another method is to treat the aid-flow as part of an over-all trade arrangement, as is done by the Socialist countries. Still another method is to finance only those commodities and/or projects where the donor country possesses a decided advantage in tendering the specified items. This practice is followed by the Federal Republic of Germany.[5]

It has been estimated that aid-tying by source tends to push up the cost of the projects by more than 30 per cent to recipient country. Double-tying increases the cost of aid procurement still further. This is obvious from the fact that the aid receiving country is required to pay more than the competitive world market price for its requirements to the donor country. It increases further when as in the case of American supplies, the recipient country is forced to get machinery, spare parts, raw materials, etc., in the ships of the donor country. This tends to reduce the real value of aid. Besides, aid-tying by source distorts the recipient country's allocation of investment resources. The development

programme becomes biased towards these projects that have a high component of the special import content allowed for under the conditions of tied aid. Aid-tying by source also limits the choice of technology used in investment projects and may force the recipient country to adopt a highly capital-intensive technique or project which may be inappropriate to a labour surplus economy.

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3. The discussion primarily follows P.T. Bauer, op. cit., Ch, 2, and "Foreign Aid, Forever?" Encounter, March 1974.

4. K.B. Griffin and J.L. Enos, "Foreign Assistance: Objectives and Consequences," *Economic Development and Cultural Change*, April 1970.

5. Guster Papanek, "The Effect of Aid and Other Resource Transfers on Savings and Growth in Less Developed Countries." *E.J.*, September 1972.

Project aid has been defined "as assistance whose disbursement is tied to capital investment in a separable productive activity."[6] The entire Soviet aid to India has been of this nature.

Its Merits. The project approach to aid has a number of advantages both from the donor's and the recipient's viewpoints : (*i*) direct control by the recipient over the selection of projects in *certain circumstances*; (*ii*) greater opportunity of influencing, in both their design and implementation, those projects normally financed by donor; (*iii*) increased case of influencing the recipient's policies in those sectors of the recipient's economy for which project aid has been made available; (*iv*) incentive for improving the quantity quality of projects; (*v*) better opportunities for publishing the donor's aid programme; (*vi*) increased access to information on sectors of the recipient's economy in which projects are financed; and (*vii*) less adverse effect on the balance of payments of the donor when project aid is combined with source-tying.[6]

Its Demerits. Project aid has, however, *certain disadvantages:* (*i*) Project aid may not be useful to the recipient country, if there is a squeeze on maintenance imports. (*ii*) Any attempt to exercise micro or project influence by the donor country will make such aid less attractive to the recipient. (*iii*) Project aid leads to inter-governmental bureaucratic frictions created by detailed supervision of project formulation and execution. (*iv*) Aid tied to specific projects also tends to distort the investment priorities of the recipient country which may have to postpone other equally important projects. (*v*) Often, excessive aid tying to

particular machinery, equipment, etc., leads to under-utilization of domestic resources like labour, because it creates a bias towards import-intensive projects.[7] (*vi*) Like aid-tying by source, project aid increases the real costs of loans to the recipient country when she has to buy machinery, and spares from the aid-giving country at a high price. According to Jagdish Bhagwati, it amounts to one-fifth of the total tied aid and in specific cases price differentials amounts to 100 per cent or even more.

Untied Aid. Untied or *programme* aid has been defined by Carlin as that "assistance whose disbursement is tied to the recipient's expenditures on a wide variety of items justified in terms of the total needs and development plan of the country rather than any particular project." India receives non-project aid from the UK, and the Federal Republic of Germany in the form of balance of payments assistance, debt relief assistance and for the import for raw materials, components and spares.

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6. Bhagwati, "The Tying of Aid," *in Foreign Aid*, (eds.) J. Bhagwati and R.S. Eckaus.

7. Alan Carlin "Projects Versus Programme Aid From the Donor's Viewpoint", *Economic Journal*, March 1967.

Its Merits. Untied aid has the following merits : (*i*) It is preferred to tied aid by developing countries because they are free to utilize aid in accordance with their development programmes—in agriculture, industry, transport, and/or in any other infrastructure. (*ii*) Programme aid also reduces the real costs of aid as the recipient can buy its requirements at competitive rates from the world markets and there are no inter-bureaucratic frictions as under tied aid. (*iii*) The recipient country can use an appropriate technology in keeping with its factor endowments and allocate its resources in a much better way than under tied aid. (*iv*) According to Singer, 'Plan aid seems to be more popular among the receiving countries than project aid. This would be expected to be considered as an advantage of plan aid, since it may spur the receiving country to greater efforts in order to get the aid, apart from smoothing relations between the aid-giver and the receiver, which is presumably also an objective of aid . . . It may be said that aid tied to specific projects is an inducement for receiving countries to think of development in terms of concrete projects. . . Development is, of course, much more than that, and in fact many expenditures classified as current or as consumption are much more developmental than

expenditures classified as “projects” or capital expenditure. From this latter point of view, plan aid, and even more annual budget aid, is clearly preferable if the donor agrees with the recipient on developmental policies and priorities.”[8]

FACTORS DETERMINING THE AMOUNT OF FOREIGN AID FOR ECONOMIC DEVELOPMENT

The amount of foreign aid flowing to LDCs, however, depends upon a number of factors:

1. Availability of Funds. Developed countries should have enough surplus capital to export. These does not appear to be a plethora of surplus in such countries. With the exception of the United States, there are very few countries that can spare so much capital as to bring it upto 10-15 billion dollars annually, required by LDCs. Some of the developed countries like Canada and Australia themselves borrow from the United States and Great Britain to finance their development projects. However, a genuine effort on the part of rich countries to mop us surplus capital can meet the requirements of LDCs.

2. Capacity to Absorb Capital. LDCs should get as much as they could usually invest. Absorptive capacity covers all the ways in which the ability to plan and execute development projects, to change the structure of the economy, and to reallocate resources is circumscribed by lack of crucial factors, by institutional problems or by unsuitable organization. The structure of the economy along with the utilization of its existing capacity will have an important bearing on a country’s absorptive capacity.[9] The International Bank for Reconstruction and Development stated in its Fourth Annual Report : “The principal limitation upon Bank financing in the development field has not been lack of money but lack of well-prepared and well-planned projects ready for immediate execution. The projects must not only be built, to be “absorbed”, they must be productive.” The amount of capital that can be utilized by an LDC is determined by the availability of complementary resources. It will remain unutilized if complementary resources are not available. Inadequacy of overhead facilities like power, transport, etc., in LDCs keep the capacity to absorb foreign aid low. The other factors which keep the absorptive capacity for productive investment low are the lack of efficient entrepreneurship,

administrative and institutional bottlenecks, the lack of trained personnel, the lack of geographic and occupational mobililty, and the small size of the domestic market. These handicaps keep the marginal productivity of capital low in LDCs and prevent the proper use of foreign aid for the execution and completion of development projects. Once these obstacles are overcome the absorptive capacity increases, the economy would complete the projects well in time and the pace of development would be accelerated. In order to increase their absorptive capacity. LDCs should, therefore, undertake appropriate and adequate pre-investment projects. In this, they can take advantage of the help being extended by such international agencies as the UN Special Fund. Above all, 'for an effective use of foreign aid, it should increasingly be linked with programmes rather than projects. This would eliminate delay in the utilization of authorized aid and increase the tempo as well as magnitude of utilization."[10] Higgins lists the following factors as evidence of the absorptive capacity of a country; unutilized capacity of some kind; opportunities for improvements in technology : a well-construed development plan : some domestic financial resources; public and business administrators capable of executing projects expeditiously and efficiently; a strong and united government having the support of the masses; a fluid and flexible society already undergoing cultural change and willing to shift from agricultural to industrial occupations; a high level of literacy and an effective system of education; and a technology-minded and development-minded public.[11] Given these factors the capacity to absorb resources for productive investment is high.

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8. IMD. Little and I.M. Clifford, International Aid, 1985.

9. H.W. Singer, "External Aid: For Plans or Projects", Economic Journal, September, 1965.

3. Availability of Resources. If an LDC has little adequately developed human and natural resources it will act as an impediment to the effective use of foreign capital. It will be all the more difficult for such a country to utilize the available foreign aid if it lacks in human and natural resources. But the latter should not act as limits to economic development.

4. Capacity of the Recipient Country to Repay Loans. This is a very pertinent problem. For the burden of servicing loans acts as a barrier to the

borrowing of large funds by LDCs. This, in itself, can be attributed to their extreme poverty. The capacity for repayment, however, hings on their capacity to export and their ability to augment their foreign exchange resources. V.K.R.V. Rao and Dharam Narain point out that, in the short run, the capacity to repay is dictated by the foreign exchange impact or investment undertaken, whether it be export-increasing or import-decreasing. "Overtime, the only determinant of the capacity to repay is the loan's contribution to productivity of the economy as a whole, and the capacities of the system to skin off the necessary portion of that productivity in taxes or pricing, and reallocate resources so as to transfer debt service abroad. The requirement for payment is that the fiscal system raise the necessary funds, and the *transformation occur* to shift resources into export-increasing or import-decreasing lines."[12] If loans flow in a steady and increasing stream and for very long periods with liberal terms of repayment, the problem of repayment is easy. For, in a very long period, the borrowing countries would have raised their outputs to such an extent as to permit net repayment. But prudence demands that loans should be tied to self-liquidating works, while grant should be made available for specific social overheads, such as research, education, public health, and community development.

5. The Will and Effort to Develop. Perhaps the most important factor is the will and the effort on the part of the recipient country to develop. Capital received from abroad does not fructify, unless it is desired and parallelled by an effort on the part of the recipient country. As Nurkse aptly said, "Capital is made at home." The role of foreign capital is to act as an effective agent for the mobilization of a country's will.

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10. J.H. Adler, Absorptive Capacity: The Concept and Its Determinants, 1985.

11. V.K.R.V. Rao and Dharam Narain, *op. cit.*

12. *Ibid*., pp. 609-620

AID OR TRADE

Of late, the idea has been gaining ground among the LDCs that trade and not aid is essential for their rapid development. It is contended that the developed countries have failed to meet the aid requirements of the developing

economies during the development decades of the 1970s and 1980s. A UNCTAD resolution adopted by a large majority of the developed countries had, in a way, made it obligatory on them to annually contribute to LDCs at least one per cent of their national income *net* after deducting withdrawals of external capital including amortisation and repayment. But they failed to contribute even 0.5 per cent of their national income. This has been especially disheartening when the capacity to absorb more aid has been expanding on the part of the developing nations and their economic performance through aid has also improved much. Gerald M. Meier has aptly observed that, 'the flow of foreign capital from developed countries to LDCs has levelled off, and the external debt servicing problem has intensified; the import surplus supported by foreign capital has, therefore, fallen markedly in recent years, and the net transfer of resources beyond imports based on exports has become relatively insignificant for the majority of LDCs. To the extent this foreign exchange constraint is not removed, an LDC cannot fulfil the import requirements of its development programme. LDC must then undertake policies that will do one or a combination of the following : reduce the country's rate of development, replace imports, expand exports, improve the country's terms of trade, induce a larger inflow of foreign aid.[13]

A larger inflow of foreign aid is neither feasible nor desirable for LDCs. Foreign aid has undoubtedly provided crucial support to the development plans of such countries, but the developed countries are not prepared to supply aid to the extent required by the less developed. On the other hand, LDCs are not anxious to have tied aid at the strict conditions laid down by the donors.[14] Prior to the meeting of UNCTAD I in 1964, the policy of import substitution was much favoured by LDCs but it failed to solve their problems. Since then, the various UNCTAD conferences have stressed the *outward-looking policies* of export promotion and improvement in the terms of trade for LDCs. The UNCTAD has been pleading for preferential tariffs for the manufactured and semi-manufactured exports of LDCs and UNCTAD III succeeded in evolving the Generalised Systems of Preferences (GSP) whereby concessions have been extended to the products of the 88 LDCs to penetrate the markets of OECD (Organization for Economic Co-operation and Development) nations.[15]

So India and other developing countries should make tremendous efforts to boost their exports so that in a decade or so they have a trade surplus.

Expansion of exports is also essential to pay for the increasing imports. Larger exports are further needed for debt service payments.

But a policy that favours trade and not aid can be successful only if there is an increase in domestic savings equal to the rise in export earnings. Trade will substitute for aid when larger export earnings raise national income and this leads to increased savings. In fact, greater trade opportunities are like greater aid flows. Trade helps in transferring real resources for investment when the LDCs are able to charge higher prices for their exports from the developed countries under preferential trading agreements. Developing countries at a high level of development like India, Brazil, etc., are able to utilize their export earnings. for further capital formation but no developed country would be prepared to buy at prices higher than the world market. So the need is to stablise the price level in developing economies and then trade can substitute aid admirably.

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13. R. Nurkse, op. cit.

14. G.M. Meier, Leading Issues in Economic Development, 2nd ed., 1970.

15. Refer to the previous section for demerits of tied aid.

However, countries that are in the early phase of development should not think of substituting trade for aid because they can only develop thier trade through aid over the long run. Although greater trade possibilities for such countries have some resource element in them, they are more complementary to aid flows than substitutable for them. Development requires both trade and aid.

CHAPTER

Two-Gap Model and Costs-Benefits of Foreign Aid

TWO-GAP MODEL

Hollis Chenery and other writers[1] have put forth the two-gap approach to economic development. The idea is that savings gap and foreign exchange gap are two separate and independent constraints on the attainment of a target rate of growth in LDCs. Chenery sees foreign aid as a way of filling these two gaps in order to achieve the target growth rate of the economy.

To calculate the size of gaps, a target growth rate of the economy is postulated along with a given capital-output ratio. A savings gap arises when the domestic savings rate is less than the investment required to achieve the target. For example, if the growth target of national real income is 6 percent per annum, and the capital-output ratio is 3:1, then the economy must save 18 per cent of its national income to achieve this growth target.[2] If only 12 per cent of savings can be mobilised domestically, the savings gap is 6 per cent of national income. The economy can achieve the target growth rate by filling this savings gap with foreign aid. Similarly, a fixed relationship is postulated between targeted foreign exchange requirements and net export earnings. If net export earnings fall short of foreign exchange requirements, a foreign exchange gap appears which can be filled by foreign aid.

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1. H. Chenery and A. Strout, "Foreign Assistant and Economic Development," *AER*, Vol. 56, Sep. 1956; H. Chenery and M. Bruno, "Development Alternatives in an Open Economy," *EJ*, Vol. 72, March 1962; and H. Chenery and I. Adelman, "Foreign Aid and Economic Development, *RES*, Vol. 48, Feb. 1966.

2. This is calculated in terms of Harrod's Formula: Gw = s/Cr.

The two gaps are explained in terms of the national income accounting

identities:

$$E - Y \equiv I - S \equiv M - X \equiv F$$

where *E* is national expenditure, *Y* is national output and income, *I* is investment, *S* is saving, *M* represents imports, *X* exports and *F* is net capital inflow.

(*I* — *S*) is the domestic savings gap and (*M*—*X*) is the foreign exchange gap. Like the basic national income accounting identities, the two gaps are always equal *ex-post* in any given accounting period. But they may differ *ex-ante* because in the long run those who make decisions about savings, investment, exports and imports are different people. So during the planning process, the plans of savers, investors, importers and exporters are likely to be different. *Ex-ante* (or planned) investment is related to the target growth rate of the economy, If the target growth rate is high, investment will also be high. But domestic savings depend upon the level and distribution of income in the society. *Ex-ante* imports include the imported inputs needed for development. They are also affected by the size of the national income and the distribution of income among the public and the different sectors of the economy. Exports are exogenously determined by world prices and by quantities that change with weather or natural conditions. As these elements are assumed to be independent of each other, the savings gap and the foreign exchange gap are unequal in size in the *ex-ante* sense. It is also assumed that savings and foreign exchange cannot be substituted for each other. Further, the country cannot transform its potential savings into exports.

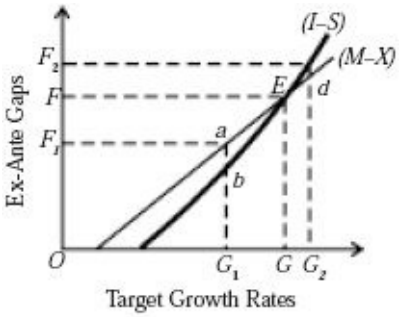

Fig. 1

Given these assumptions, Figure 1 illustrates the two *ex-ante* gaps and their relation to different target growth rates of income. The *ex-ante* savings and foreign exchange gaps are measured along the vertical axis and the targe growth rates along the horIzontal axis. The *ex-ante* savings gap is represented by (*I* - *S*) curve and the *ex-ante* foreign exchange gap by (*M*–*X*) curve. Both are equal at point *E* and the target growth rate of *OG* is achieved with *OF* inflow of net foreign aid. If the target growth rate is OG_1 then the

foreign exchange gap is larger than the savings gap by *ab*. This growth rate will not be achieved because the inflow of foreign capital is not sufficient to fill the larger foreign exchange gap OF_1. Short run forces might bring about the *ex-post* equality of the two gaps without achieving the target growth rate. On the other hand, if the target growth rate is OG_2, the savings gap is larger than the foreign exchange gap by *cd*. Again, this growth rate will not be achieved because the inflow of foreign capital is inadequate to fill the savings gap. It requires a larger inflow of foreign capital to meet the larger savings gap OF_2. Imports cannot be reduced due to the nature and limited flexibility of the productive system and of the composition of consumer demand. To overcome these structural rigidities, Chenery suggests restrictions on the pattern of consumption, the distribution of income, the level and growth of employment and changes in the exchange rate. Such measures can bring adjustments in the two gaps without foreign aid. But they will retard growth.

Some economists are of the view that if prices are flexible, such rigidities are not likely to be found. If resources are optimally allocated, there can be only savings constraint on growth and hence only savings gap in the economy. If appropriate exchange rate policies or price policies are followed, resources would shift to remove the difference between the growth effect of imports and domestic savings and hence the difference in the *ex-ante* gaps. This view holds that if the foreign exchange gap is dominant, it must be due to inappropriate price policies which might have led to malallocation of resources.

Assuming that all capital goods are imported and only consumer goods are produced domestically, another two–gap model holds that structural rigidities imply that (*i*) no substitution is possible between imported capital goods and domestic factors in production, and (*ii*) no substitution is possible between different consumer goods in consumption.

The foreign aid required to fill the gap is determined by the dominant gap at a given point in time. If the savings gap is larger than the foreign exchange gap, the economy is said to be in a savings constraint. On the other hand, if the foreign exchange gap is larger than the savings gap the economy is in a foreign exchnge constraint. Foreign aid can help in removing the savings constraint by the inflow of capital. Over the long run, the amount of foreign aid required will equal the difference between the increase in investment and

the increase in savings generated by rising income. When the savings gap disappears the target growth rate of the economy will be sustained.

If the foreign exchange constraint is dominant or binding for an LDC at any given point in time, foreign aid can help in overcoming it with foreign aid. The country can start new investment projects by importing capital and intermediate goods and technical assistance. Over the long period, the required foreign aid will equal the difference between the increase in imports and exports. The foreign exchange gap will disappear when exports rise to a level which covers the required imports for the target growth rate of the economy.

Of the two gaps which dominates first in LDCs, Chenery and Strout cite empirical evidence to show that first such countries have dominant savings constraint and then the foreign exchange constraint over their course of development. In fact, they divide countries having savings constraint and foreign exchange constraint in two separate categories.

ITS LIMITATIONS

The two-gap analysis is based on certain restrictive assumptions which limit its usefulness in achieving the target growth rate in LDCs.

1. It presupposes that an increase in domestic savings cannot be utilised as a substitute for the required foreign exchange to maintain investment for the target growth rate. It further assumes that the country cannot follow export promotion and import substitution policies. It also assumes structural rigidities and non-substitutability between different types of goods. Given such rigidities, if the foreign exchange gap is larger than the savings gap, the domestic saving potential can be used neither to produce capital goods nor exports. These assumptions are highly unrealistic and have not been supported by empirical evidence.

2. Critics point out that the LDCs with dominant savings constraint do not need foreign aid. A dominant savings gap implies that the country is functioning at a full employment level. It is, therefore, not utilising its foreign exchange to import capital goods for investment purposes because the domestic resources are fully employed. As there is full employment, investment in capital goods through imports will lead to inflation.

3. This analysis does not consider the absorptive capacity of the economy, and ability to formulate and execute productive projects with aid.

4. The two-gap analysis is a highly aggregative approach which treats all types of capital investments as homogeneous. This is unrealistic because the capital requirements of LDCs are meant for specific needs and they receive foreign aid for different sectors, industries and projects.

5. The two gaps are mechanistic. They assume stable values of the parameters in future. But this is unrealistic because the capital-output ratio and the marginal savings rate change over time, depending on domestic conditions and policies. After all, foreign aid cannot be exclusively relied upon to fill these gaps in the long run. With development, structural rigidities are removed and the domestic economy is so transformed as to equilibrate the two gaps. Domestic policies aiming at import substitution and export promotion determine the aid requirements of LDCs. Aid helps in removing rigidities and bringing structural traisformation of the economy. Thus the two-gap model is very mechanistic in that it lays emphasis on filling the gaps rather than transforming the economy with aid.

6. The two-gap analysis is at best an approximation for calculating the foreign aid requirements of LDCs. But there are difficulties in fixing import requirements, in arriving at postulated requirements, potential domestic savings and expected foreign exchange earnings. It thus pravides a crude method of estimating the foreign aid requirements af LDCs.

IMPORTANCE OF TWO-GAP ANALYSIS

The two-gap analysis is highly useful for an LDC in order to estimate its capital requirements for economic development. How much of capital can be generated within the economy and how much inflow of capital is required from abroad? This problem arises when there is a savings gap in order to achieve a target growth rate of the economy. The government expenditures are higher than government revenues through taxation, and private investments are higher than private savings.

An LDC is characterised as low-saving and low-investing economy. At the existing rate of saving, it cannot invest much as to have enough capital for

development. To mobilise domestic savings, individual and company savings and budget surplus are not sufficient. So it is not possible to raise the current rate of capital formation.

Further, there is the problem of structural composition of capital when certain capital goods cannot be domestically produced. They are imported. This leads to a balance of payment constraint. Besides, an LDC requires raw materials, foodgrains, and other essential goods from abroad to carry on its development plans. But its exports are either stagnant or have a tendency to decline. This gap between imports and exports leads to the foreign exchange gap which can be filled by foreign aid. Foreign aid in turn requires the servicing of external debt. This further widens the foreign exchange gap which can be narrowed by importing more capital. So this vicious circle continues.

Thus the two-gap analysis helps in understanding the extent to which foreign resources are required to fill the savings gap and the foreign exchange gap so that the development efforts of the country are continued.

The divergence between the two gaps also highlights the role of foreign aid in economic development. If the savings gap is greater than the foreign exchange gap, it can be narrowed by the inflow of capital. The foreign gap between investment and saving will be bridged over the long run. Ultimately, the identity of the tow gaps is brought about. On the other hand, if the foreign exchange gap is greater than the savings gap, foreign aid will lead to more investments and increased savings generated by rising incomes. Exports will rise over the long-run. Ultimately, the two gaps will become identical. Thus the two-gap analysis helps in achieving the target growth rate of the economy.

COSTS AND BENEFITS OF AID

Foreign aid which flows from the donor country in the form of grants, loans, technical assistance contributions in kind, etc. to the recipient country involves real costs for the former and provides real benefits to the latter. John Pincus[3] has measured the real costs of aid to the donor and the real benefits to the recipient of aid. He measures the real cost of capital flows far a capital exporter as the income he forgoes as a result of the outflow of capital, given alternative passible uses of the same funds. The real benefit for a capital

importer is measured by the net increment in income as a result of investing the capital inflow received, as compared with making the same investment with capital from alternative sources.

For measuring capital flows from developed countries (DC) to LDCs, Pincus introduces the concept of a "grant equivalent" or A grant is a sort of gift from a DC to an LDC on which the latter is not required to pay any interest or make repayment. A loan given by a DC an soft terms such as lower interest rate, longer grace period and longer repayment period has some concessional element as compared to a loan at commercial market terms. The concessional element in the loan can be converted into its grant equivalent. The concessional element or grant equivalent is the difference between the amount of loan and the present value of repayments discounted at the donor's long-term market rate of interest. Thus the real cast of aid loan to a donor is the difference between the present value of the future repayments discounted at the donor's long-term market rate of interest and the size of the loan.

The present value of an aid loan, therefore, depends upon the interest rate charges, relative to the rate of return (discount rate) earned by the donor if the same amount had been invested at home, and on the period of repayment of the aid loan. If the loan rate equals the rate of return in the donor country, then the grant equivalent is zero and the loan is costless to the lender. If the rate af return in the donor country is higher than the loan rate, the real cost af the loan will be higher for the lender. On the contrary, if the loan rate is higher than the rate of return, the real cost will be less to the lender who will gain by lending.

The real benefit of aid loan to the recipient may differ from its real cost to the donor. The real benefit of a loan will depend upon the rate of return (discount rate) in the recipient country relative to the interest rate charged by the donor. If the rate of return on a similar loan in the recipient country is higher than the interest rate on aid loan, the real benefit of a loan to the borrower will be greater, and *vice versa.*

Besides the rate of return and the loan rate, the real cost and the real benefit of aid loan depend upon the period of grace and period of repayment. If the rate of return is higher than the loan rate in the lender country, and the grace period and the repayment period are longer, the real cost to the donor will be high, and *vice versa.* On the other hand, if the rate of return in the recipient country

is higher than the loan rate and the grace and repayment periods are longer, the real benefit to the donor will be larger, and *vice versa.*

However, it is difficult to calculate the real cost of aid when it is tied and is in the form of contributions in kind. If the donor ties the aid by requiring the recipient to import from the donor, the grant equivalent will be reduced for the recipient. The real cost to the donor may be less because it may be supplying its goods at prices higher than world market prices. Since the grant equivalent is reduced in this case, the real benefit to the recipient of tied aid is also less. Similar is the case when the donor gives aid in the form of contributions in kind, such as surplus agricultural commodities valued at prices higher than world market prices. The opposite will be the case when aid is not tied and goods are valued at world market prices. Therefore, in computing the real cost of foreign aid to donors in a fully employed economy, John Pincus includes the sum of (*i*) grants, including technical assistance at nominal value; (*ii*) loans valued at the difference between the aimount of loan and the present value discounted at the market rate of interest; (*iii*) contributions in kind valued at world market prices; and (*iv*) sales of goods or loans repayable in recipient country's inconvertible currency valued as grants, after making allowance for funds actually spent by the donor in the recipient country.

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3. John Pincus, *Economic Aid and International Cost-sharing*, 1965, and *Costs and Benifis of Aid: An Empirical Analysis*, UNCTAD, 1967.

This analysis of computation of the real cost to the donor is based on certain *assumptions. First*, it is assumed that resources are fully employed in the donor country. In case resources are underemployed in such a country, aid involves a real cost if resources are shifted from actual domestic projects to foreign aid. If the domestic projects have not been actually adopted, then the aid does not involve real cost. *Second*, this analysis assumes that prices of goods and services under tied aid are valued at world market price. *Third*, the grant equivalent for each year is measured without deducting the debt service payments of earlier loans.

The above analysis can also be applied to the real benefit of capital inflows for recipients. The higher the grant equivalent to recipients, the greater will be the real benefit to them. The grant equivalent is higher if the terms of aid are

lenient. Similariy if the major portion of the aid is non-tied, the greater is the real benefit to the recipient country. Under such a situation, the same nominal amount of capital inflow will lead to the increase in the real benefit. If the conditions of aid are made softer and the adverse effects of aid-tying are reduced, the real benefit of capital inflow can more closely approach the nominal value of the inflow of capital to the recipient country.

Though the real benefits of aid are measured like its real costs, yet its values normally diverge from the latter due to a number of reasons. *First*, the interest rate for discounting usually differs in donor and recipient countries. If the discount rate in the recipient country is lower than that in the donor country, the grant equivalent to the recipient is less as compared to the donor. *Second*, in countries which adopt exchange controls, the discount rate to be paid by the recipient country will equal the rate in the international securities market. If the donor country's currency is over-valued the discount rate of the recipient country would have to be increased accordingly. *Third*, the tied aid will reduce the grant equivalent if the donor country charges higher prices than the the world prices for its goods and services. This will lead to a divergence between donor's cost and recipient's benefit estimates of grant equivalent . *Fourth*, it is difficult to calculate recipient's benefit from private investment. In particular, the beneficial effects of technical assistance and technological transfer to the recipient country are beset with many practical difficulties. All these considerations lead to the divergence of real benefits of aid to the recipient countries from the real costs to the donor countries and thereby tend to reduce the estimates of grant equivalents for recipients and donors.

ITS IMPLICATIONS

The cost-benefit analysis of foreign aid leads to certain policy implications.

1. Non-tied aid increases the real cost to the donor country. Tied aid reduces the real cost to the donor. At the same time, tied aid increases the burden of repayment for the recipient and reduces the real benefit of the aid. It is, therefore, advisable that the recipient should insist on non-tied aid as far as feasible.

2. This analysis lays emphasis on the DCs to ease the terms and conditions of aid to the LDCs. They should so adjust the aid that the grant equivalent per unit

value of aid given should increase rather than decline. This argument gains greater force from the fact that a number of LDCs have very high debt service obligations and they find it difficult to repay their accumulated debts. Debt service in such countries competes with essential imports for foreign exchange earnings, thereby adversely affecting domestic savings, investment and hence development. Therefore, the DCs should raise the grant equivalent per dollar of foreign aid to the LDCs. It is better to charge a rate of interest lower than the rate of return on loan in the recipient country.

3. Further, there is always the fear that the recipient may default on loan repayment. Therefore, the donor should provide grants rather than loans. But due to psychological and political reasons, it is in the interest of the recipient country that the donor should provide it soft loans rather than grants.

CHAPTER

Private Foreign Investment and Multinationals

NATURE

At the turn of the present century, private foreign capital mostly flowed in the form of indirect investments from Europe to the underdeveloped countries. Such capital as flowed to low income countries in the 1920s in the form of direct investments went mainly into production for export. Very little of it went to manufacturing for the home market.[1] But since the Second World War, over half the private investment has been direct. Direct private investment has been concentrated mainly in the extraction of raw materials like iron, crude oil, manganese, bauxite, copper, electric energy, etc. Only a small percentage has gone to manufacturing and distribution. Not until the economy takes off that direct investment is made in manufacturing. That is why direct investment in manufacturing flows to those countries which are somewhat industrially advanced and have large domestic market.

MERITS OF PRIVATE FOREIGN INVESTMENT

Private Foreign Investment (PFI) possesses certain advantages which are discussed as under:

(*a*) PFI not only provides finance but also managerial, administrative and technical personnel, new technology, research and innovations in products and techniques of production which are in short supply in LDCs.

1. Nurkse. *op. cit.*, p. 83.

(*b*) This may, in turn, encourage local enterprise to invest more itself in ancillary industries or in collaboration with foreign enterprise. In fact, foreign

enterprise encourages local enterprise in two ways: directly by fostering local enterprise with men, money, and material, and by imparting training and experience to its personnel; and indirectly by creating demand for ancillary or subsidiary services (like transport and training agents) which are uneconomical for private foreign enterprise to provide.

(*c*) By bringing capital and foreign exchange PFI helps in filling the savings gap and the foreign exchange gap in order to achieve the goal of national economic development in LDCs.

(*d*) A part of the profits from direct foreign investment is generally ploughed back into the expansion, modernization or development of related industries..

(*e*) PFI adds more value added to output in the recipient country than the return on capital from foreign investment. In this sense, the social returns are greater than the private returns on foreign investment.

(*f*) PFI also brings revenue to the government of an LDC when it taxes profits of foreign firms or gets royalties from concession agreements.

(*g*) PFI helps in raising productivity and hence the real wages of local labour. When foreign investment induced industrialisation takes place, the real wages of the newly employed workers are higher than the real wages of workers in the rural sector of the economy. If PFI is in export-oriented industries, it leads to much higher social benefit than it is in import-substitution industries. Because the former have large backward and forward linkage effects. And if export industries are labour intensive, they also provide larger employment opportunities.

(*h*) Direct foreign investment also places less burden on the balance of payments of an underdeveloped country in the early stage of development. For, the time lag between the starting of new business concerns and the reaping of profits is large. Moreover, profits are likely to be small in the earlier stages of production. Thus the remittance of profits from direct investment brings less pressure on the balance of payments. If PFI mainly flows into agriculture and extractive industries which produce primary goods for export, it further helps in easing the balance of payments position of LDCs. In the case of a developing

country like India, PFI has a greater salutary effect on the balance of payments since it helps in producing manufactured articles, not only for the domestic market but also for foreign markets.

(*i*) Lastly, PFI flowing into a developing country also encourages its entrepreneurs to invest in other LDCs. Firms in India have started investing in Nepal, Uganda, Ethiopia and Kenya and other LDCs while they are still borrowing from abroad.

DEMERITS OF PRIVATE FOREIGN INVESTMENT

PFI has certain disadvantages in the form of costs to the recipient country which tend to offset its benefits:

(1) The receipient country may be required to provide basic facilities like land, power and other public utilities, concessions in the form of tax holiday, development rebate, rebate on undistributed profits, additional depreciation allowance, subsidised inputs, etc. Such facilities and concessions involve cost in absorbing an LDC's resources that could be utilized elsewhere by the government.

(2) To attract PFI, LDCs have to provide sufficient facilities for transferring profits, dividends, interest and principal. If these payments lead to a net capital outflow, they create serious balance of payments difficulties. Thus the indirect costs of debt servicing and balance of payments adjustments create serious foreign exchange crisis, thereby adversely affecting the national economy.

(3) No doubt, PFI increases investment, employment, income and saving in LDCs, but it adversely affects income distribution when it competes with home investment. Capital and other resources may flow to foreign enterprises in preference to domestic enterprises. This may reduce profits in the latter, thereby discouraging local enterprise.

(4) Many foreign concerns operating in LDCs, reserve all senior executive posts for their nationals and pay them very high salaries with many perks which are a huge drain on the resources of the recipient country. At best, they train local nationals for lower and middle level posts having little independent decision making. Moreover, the lavish spending habits of foreign nationals

have an undesirable demonstration effect on the nationals of LDCs and create social tensions.

(5) PFI brings in highly capital intensive technologies which do not fit in the factor proportions of LDCs. Often obsolete and discarded machines and techniques are imported which involve high social costs in terms of replacement after a few years.

(6) PFI also involves costs in the form of a loss of domestic autonomy when foreign firms interfere in policy-making decisions of the government of an LDC, which favours the foreign enterprises. Such interference is usually resorted to by the multinational corporations.

MULTINATIONAL CORPORATIONS AND LDCs[1]

MEANING

A multinational corporation (MNC)[2] is a company, firm or enterprise with its headquarters in a developed country such as the United States, Britain, West Germany, Japan, etc. and also operates in other countries, both developed and developing. They are spread not only in the LDCs of Asia, Africa and Latin America, but also on the continents of Europe, Australia, New Zealand, and South America. They are engaged in mining, tea, rubber, coffee and cocoa plantations; oil extration and refining, manufacturing for home production and exports, etc. Their operations also include such services as banking, insurance, shipping, hotels and so on. Thus "like animals in the zoo, MNCs come in various shapes and sizes, perform distinctive functions differently and their individual impact on the environment."

Sanjay Lal and Streeten[3] define the MNCs from economic, organisational and motivational viewpoints. The economic definition lays emphasis on the size, geographical spread and extent of foreign involvement of the MNC. According to this definition, a typical multinational company is one with net sales of 100 million dollars to several thousand million dollars having direct foreign investment in manufacturing usually accounting for at least 15 to 20 per cent of the company's total investment. Direct foreign investment means at least 25 per cent participation in the share capital of the foreign enterprise.

The organisational definition stresses on some organisational aspects of an MNC, besides the economic ones. In this respect a truly MNC is that which "(*a*) acts as an organisation maximising one overall objective. for all its units, (*b*) treats the whole world (or the parts open to it) as its operational area, and (*c*) is able to coordinate all its function in any way necessary for achieving (*a*) and (*b*).

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* This section draws heavily on my article "Multinational Corporations—The Harms They are Doing to Developing Countries," *The Welfare Economist*, March, 1976.

2. MNCs are also known as Transnational Corporations (TNCs) International or 'global'corporations.

3. *Foreign Investment, Transnational and Developing Countries*, 1977. The following analysis closely follows S. Lal and Streeten.

The motivational definition highlights "corporate philosophy and motivation in laying down criteria for multinationality. Thus, 'True' multinationality is generally indicated by lack of nationalism, or a concern with the firm as a whole rather than with any of its constituent units or any country of its operations." On this basis, firms are distinguished between ethnocentric (home-oriented), polycentric (host-oriented) and geocentric (world-oriented), on the basis of attitudes revealed by their executives.

Lal and Streeten define MNCs in general as very large firms with widespread operations which are clearly international in character and have more than five foreign subsidiaries or more than 15 per cent of total sales produced abroad, and acting in a cohesive manner to achieve maximum profits or growth.

SPREAD OF MNCs

MNCs overwhelmingly dominate not only global investment but also international production, trade, finance and technology. But adequate and reliable up-to-date data regarding the spread of MNCs in terms of subsidiaries, production, trade; finance and technology are rarely published and hence are not available. A pioneering study, Sovereignty at Bay (1971), by Raymond Vernon listed 300 colossal MNCs whose total production (not sales) of goods and services totalled $350 billion a year. Of these, 187 were U.S. controlled raw material producers and manufacturing concerns, half of the remaining third were British and Dutch, and the other half European and Japanese.

Among the first ten, eight were American and the remaining two were British-Dutch combines, the largest being General Motors with the total world sales of $25 billion which exceeded the GNP of all but a dozen countries in 1970. An American magazine Forbes (November 15, 1971) published a list of 50 major American corporations which revealed that on an average 40 per cent of their total revenue came from their fields like tea (115 branches), pharmaceuticals (24 branches and subsidiaries), cosmetics, food products, manufacture of industrial products and consumer goods of wide range, oil exploration, book publishing, automobiles, chemicals, fertilisers, etc.

MERITS OF MNCs

The advantages flowing from the MNCs to the LDCs are based on the theories of direct foreign investment. Such theories are related to oligopolistic interdependence and monopolistic behaviour of the MNCs. Hence they confer the following advantages on MNCs:

1. MNCs are financially very strong and hence provide large and cheap capital to the LDCs by way of direct investment.

2. They undertake great risk in investing their funds in LDCs in the face of imperfect infrastructural facilities like power, transport, skilled labour, etc., low market demand and short supply of inputs.

3. They start new ventures and bestow the advantages of superior management, training, education and entrepreneurial ability in LDCs.

4. They transfer superior technology to LDCs based on R & D in the parent concerns because they are able to spend huge funds on R & D. This leads to the discovery and introduction of new processes and new and differentiated products in LDCs which tend to raise the standard of living of the people in LDCs.

5. MNCs bring in new techniques of marketing in LDCs through market research at their headquarters. They adopt novel advertising and promotional methods which impart information to buyers and create demand for particular brands and products. This encourages competition.

6. Above all, MNCs are socially desirable in LDCs because they lead to a net increase in capital formation, output and employment.*

DEMERITS OF MNCs

MNCs have come to be regarded as agents of exploitation in LDCs because of their invidious operations which are highlighted in their modus operandi.

The US-based MNCs insist on cent per cent ownership in LDCs and they have succeeded in this in Singapore, Mexico, Hongkong, Brazil and Taiwan. With low rates of taxation in these countries, they have been exporting "super profits" to America.

In countries like India, where since the 1960s, the MNCs are allowed to operate as joint ventures with 25 to 40 per cent participation, they enjoy a number of privileges which again tend to increase their profits manifold. Such concessions or privileges are in the form of dividends, payment for installation fee, royalty on the use of patents, payment on know-how fee, payment for imported equipment whose price is 30 to 40 per cent higher than the competitive international price, and tax holiday for a number of years if the concern belongs to the priority sector industry.

Besides, the staff which comes in the wake of an MNC is paid very high salaries. Some of their top executives get much more than the highest paid executive head of the state in which they serve. Not only this, the MNCs pay to the locally employed labour twice and even three times more than what they might earn in local firms. This not only leads to social inequality but also breeds discontent and unrest among the workers employed in indigenous industry.

The MNCs are pre-empting local savings by overpricing the imports and underpricing the exports of LDCs. In cases where there is competition from local entrepreneurs, the MNCs undercut them by charging low prices for their products. As a result, the local firms are squeezed out of business. But if there are very few local firms to compete with, the MNCs buy their majority shares or merge them to exercise control over them.

The MNCs transfer second rate and overpriced technology to LDCs.** More

often, they try to minimise the transfer of technology to such countries by (*a*) carrying out R & D in the parent company located at the headquarters; (*b*) neglecting the training of local personnel for R & D posts; and (*c*) holding closely the technology itself. Moreover, the technology which the MNCs transfer into the LDCs is capital-intensive and hence unsuited to their capital-scarce and labour-surplus economies.

The MNCs set up their plants in big towns and cities in LDCs where infrastnictural facilities are easily available. Thus they accentuate sectoral inequalities and strengthen dualism in such countries.

Besides, the long-term effect of direct and indirect investment by the MNCs on the balance of payments is usually negative as they repatriate huge amounts in the form of royalties, profits, interest, dividend capital, etc.

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* For other benefits of MNCs refer to the Merits of PFI in the above section.

** However, there have been exceptions in the case of Canada, Taiwan and Hongkong by US multinationals because the products manufactured in their plants located in these countries are exported to the USA.

Last but not the least, the MNCs influence the internal politics to the detriment of the LDCs by bribing the legislators not only directly but also indirectly. They offer posts in the higher echelons of their companies to the privileged sections of the society, especially to the friends and relatives of the local politicians, bureaucrats and the economic oligarchies. They also subvert domestic fiscal and monetary policies in LDCs.

AN OVERVIEW

It is not that the MNCs are simply the agents of exploitation, they also act as agents of development. By establishing manufacturing plants, providing production, managerial, technical, organisational and marketing skills, and by harnessing their resources, the MNCs have helped in augmenting the GNP of Singapore, Hongkong, Taiwan and Canada. But as pointed out earlier, these benefits accruing to such countries have been the outcome of the self-interest of the MNCs, that is, the need to meet the US domestic market.

The problem before the other developing countries like Indian is how to

control and curtail the damaging effect of MNCs and harness them for their maximum benefit. All this depends upon the "will" to control the working of these global giants. Given this, the LDCs should have stringent anti-trust laws, as we have in India the twin institutions known as the Monopolies Commission and the MRTP Act. The MNCs should be encouraged to enter into 'licensing agreements' with a local manufacturer who may be taught the use of the patented processes in lieu of a fixed royalty.

The LDCs should also take advantage of the expertise and superior technical know-how of the MNCs by entering into 'turnkey agreements' with them whereby a foreign company undertakes to build a plant or help in exploiting their natural resources, imparts training to local personnel, provides technical know-how, starts production and then leaves the country for good by entrusting the entire operations to the local firm. In lieu of these services, the MNC should be paid either a fixed fee or cost-plus fee. India has entered into such agreements for the exploration of its off-shore oil resources.

Further, there should be joint venture agreements on 60 : 40 basis at the maximum by the local concerns with the MNCs. All joint ventures with the foreign concerns should be based on specific agreements to manufacture the product within the country with indigenously produced and procured raw materials (provided they are available), to train and employ nationals in high jobs, to carry on R & D within the host country and to reinvest a certain percentage of profits within it.

It is advisable, as suggested by Streeten, that the governments of LDCs should not press the MNCs to pay specially high wages to local labour. Rather, the MNCs should be asked to employ local people at the prevalent rates for the same jobs in the country. On the other hand, they should tax the MNCs more heavily so that the people of the country benefit rather than the few people who work for them. This increased tax revenue may be spent in providing greater infrastructural facilities to the people which will benefit all sections of the society including the MNCs. Moreover, foreigners receiving higher salaries and better facilities than their local counterparts in similar jobs should also be taxed equally.

Given the conditions laid down above, the MNCs should be encouraged to establish plants in backward areas or regions of LDCs so that regional

imbalances are ironed out.

Since there is no likelihood of any agreement on the international plane over a ‘code of conduct’ which may govern the operations of MNCs, every LDC should have its own independent agency to report on the working of MNCs from time to time in that country and should not hesitate to take stern actions against the offending giants which may even be tantamount to nationalisation.

CHAPTER

Economic Integration Among Development Countries

NEED FOR ECONOMIC INTEGRATION

Economic integration among developing countries[1] is needed to accelerate their economic development by (1) encouraging the establishment and growth of manufacturing industries; (2) expanding intra-regional and extra-regional trade; (3) increasing the gains from trade; and (4) providing benefits of the extension of competitive markets.

Developing countries chiefly export primary products which are traded freely in world markets. On the other hand, their imports consist mainly of intermediate goods and manufactures which the majority of them either do not produce or produce in limited quantities. Economic integration is essential to change the existing pattern of trade which requires changes in the existing pattern of production. The aim is to industrialise their economies on modern lines.

There is much less interest in trade creation through destroying inefficient producing units existing in the member countries. But there is more interest in trade diversion by shifting purchases from the rest of the world to member countries, and more constructively, the achievement of economies of scale.

1. This also relates to *South-South Economic Cooperation*. If we were to see a globe, we will find that all the developing countries, with the exception of Australia and Newzealand, are located in the Southern hemisphere, while all developed countries, except Australia and Newzealand, are in the North.

The purpose is also to mobilise and utilise fully their unemployed resources through industrialisation.

Finally, there is the need to attract foreign investment and utilise it profitably for economic development of the customs union or free trade area.

BENEFITS FROM ECONOMIC INTEGRATION

There are many prospective gains from regional integration among developing countries. The following benefits accrue to developing countries when they form a *trading block*, or *a customs union* or *a free trade area* among themselves.

1. There is expansion of trade among member countries with the removal of trade barriers.

2. There is "trade creation" when goods which were being produced by high-cost partners are replaced by low-cost producers within the region.

3. This leads to the movement of resources from less efficient to more efficient production. This further tends to increase the gains from trade.

4. Since the developing countries have similar levels and patterns of consumption in particular regions, regional trade agreements among them provide greater opportunities to expand their markets and develop.

5. On the basis of inter-country agreements for the establishment of new and the expansion of existing manufacturing industries, the countries can benefit from the economies of scale. The choice of industries and countries can be done on the basis of their factor endowments and by having detailed feasibility and social cost-benefit studies. To have the desired changes in the pattern of production will require a variety of policy measures like tariffs on imported manufactures, fiscal incentives, administrative controls, etc.

6. In order to exploit economies of scale and utilise excess capacities in existing plants or process, developing countries can have complementary agreements for their development. This will meet the internal demand for goods manufactured in such plants within the free trade union.

7. Regional integration among developing countries encourages competition among them. Every member country tries to innovate and adopt

new methods of production in its specified industries. It increases its technical and productive efficiency by increasing investment in new machines and equipments. Resources are reallocated from less efficient to more efficient industries. As a result, costs of production are reduced and output, employment and income increase with the expansion of trade within the trading block.

8. Integration among developing countries also attracts direct foreign investment in new regionally-based manufacturing industries that enjoy economies of scale. This requires inter-governmental agreement for the establishment of chosen industries or plants, as also policy measures like tariff against foreign competition, fiscal and administrative measures for their implementation and success.

9. In the long-run, the new manufacturing industries will meet the local demand in member countries. With the extension of the market and increase in economies of scale, these industries will be able to compete in world markets and thus export manufactured goods.

10. Regional integration may also lead to improvement in the commodity terms of trade of member countries. This is achieved only if the demand for imports by members is reduced by producing imports substitutes, imposing tariffs on imported goods and increasing exports to the outside countries. However, these conditions can be met in the long-run when the developing countries have reached the take-off stage.

PROBLEMS OF ECONOMIC INTEGRATION

There are many problems or difficulties in the formation of a customs union or free trade area by developing countries. They are enumerated as under :

1. Political. In any regional integration, there are always small and large and less developing and more developing countries. The smaller, weaker and less developing countries fear that their freedom and sovereignty might be in danger if they form a customs union with their bigger and more powerful neighbour. This is particularly so in Asia and Africa where there are national rivalries and boundary disputes.

2. Administrative. There are certain administrative requirements of a customs

union which may be beyond the capacity of poor and weak members. They may not have efficient and sufficient administrative staff to implement the policies of the union.

3. Uneven Distribution of Benefits. There are disparities among developing countries which create problems in equitable distribution of benefits. The lagging or weak countries fear that the economically better partner countries will retard rather than assist in their economic development. They are, therefore, reluctant to form a union with the latter countries.

4. Geographical Distances. The developing countries often lack in geographical proximity to each other. Nearness to each other is essential for forming an economic union to be successful. Even if there is geographical promity among them, they lack in good transport, communications, infrastructural and other facilities for intra-regional trade.

5. Trade Diversion. The volume of foreign trade in developing countries is generally high relative to their domestic production. But the volume of intra-regional trade is very small in the region's total foreign trade. These two diverse trade patterns will lead to trade diversion among developing countries when they form a union. This is because it will lead to diversion of old trade from foreign countries to each other. Thus it is no use forming a union because trade diversion is always harmful.

6. Economically Diverse. The majority of developing countries produce and export primary products. The formation of an economic union will not serve any purpose because they will be competing for the same world markets for their primary products. According to Kindleberger, they are not economically unified. They are typically more competitive than complementary, and their competitive interests make it hard for them to form *an economic union*."

7. Loss of Revenue. The fear of loss of revenue with the formation of a regional union is also an obstacle in the economic integration of developing countries. This is because with economic union, intra-regional tariffs will be eliminated. Moreover, with the formation of a union and adoption of a common external tariff, the weak members will not be in a position to raise tariffs by themselves in order to meet their revenue requirements.

Conclusion : These difficulties or problems explain the failure or slow progress towards economic integration in developing countries. For example, the Central American Common Market (CACM), after some initial success, dissolved in 1969. The East Africa Common Market (EACM) was also dissolved.[2]

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2. D. Salvatore, *Theory and Problems of Integrational Economies*, 3/*e*, 1990.

MEASURES TO ENCOURAGE ECONOMIC INTEGRATION AMONG DEVELOPING COUNTRIES

The following measures are suggested for the formation and success of an economic union (or a free trade area or a regional block) among developing countries.

It may be noted that all measures should aim at removing fears of the dominant members creating confidence among the laggard members of the region, besides strengthening economic relations.

1. Trade Liberalisation. The first step should be towards partial liberalisation of regional trade. It might be in specific products. Trade barriers on products in which members of the region possess comparative advantage should be removed gradually. The bigger states should give preferences in importing goods from the weak states without trade restrictions. On the other hand, small states should be allowed to levy low tariffs on imported goods from the big member states so that they may not lose revenue.

2. Trade Infrastructure. For the development of intra-regional trade, the establishment of effective infrastructure facilities such as transport and communications within the region is required. Countries having common borders can have inter-connected road and rail transport facilities.

3. Foreign Investment and Technology. There should be a regional agreement for the entry of foreign investment and technology in countries of the region. Such an agreement can bargain with foreign suppliers to the common benefit of all the countries. It can also decide about the establishment of joint ventures and technology transfer among the regional states. In this

regard, it is necessary that the interests of laggard states are protected.

4. Counter-Trade. To promote intra-regional trade and cooperation among small and big states, counter-trade *i.e.* exchanging goods and services rather than purchasing them should be started.

5. Regional Institutions. To promote intra-regional trade such regional institutions as joint business councils, trade promotion organisation, regional trade information centre, regional export processing zones, etc. can be helpful.

6. Balance of Payments Support. Economically weak countries are prone to balance of payments problems in intra-regional trade. To help such countries BOP support should be provided to them by establishing a regional payments union funded by all members in which big countries should contribute more.

7. Credit Facilities. To provide credit facilities to exporters, to give adequate line of credit to importers, and to coordinate the activities of existing trade financial institutions and commercial banks, a regional central bank should be established. This will help to increase intra-regional trade.

8. Fiscal Incentives. When a custom union is formed, small countries suffer the most from the loss of tariff revenue which forms a large part of their total revenues. For this, the union should compensate such member countries for their net loss of revenue through inter-governmental budgetary transfers from big partners. This can be done by the adoption of an agreement among member countries to harmonise fiscal incentives.

Fiscal incentives may also be to the location of new enterprises in weak member states with the support of inter-country fiscal transfers. Another measure is to set up a regional development bank to provide loan finance on a preferential basis for investment in infrastructure and industries in such countries.

CONCLUSION

A few empirical studies of economic unions in Africa and Central and South America suggest that the benefits of economic integration among developing countries can be substantial. But they require effective coordination which the

developing countries lack due to political and ideological differences among them and the fear of hegemony of large and strong states in regions. Despite these, even though a customs union may be the ultimate objective, it will still be a sizeable accomplishment in the immediate future to secure the mutually supporting measures of regional investment policies, regional trade liberalisation and regional aid institutions in developing countries".

CHAPTER

Millennium Development Goals (MDGs)

INTRODUCTION

In September 2000 at the UN Millennium Summit, 189 world leaders adopted the UN Millennium Declaration which laid down the Millennium Development Goals [MDGS] made up of 8 goals and 18 targets to be achieved by 2015. These goals and targets have vast array of interlinked dimensions of development ranging from the reduction of extreme poverty to gender equality, to health, education and environment.

The March 2002 UN International Conference on Financing for Development in Monterrey, Mexico and the September 2002 World Summit on Sustainable Development in Johansberg, South Africa reaffirmed the commitments of rich and poor countries to these goals and their development targets.

GOALS AND TARGETS

Goal 1.		Eradicating extreme poverty and hunger.
Targets:	*1.*	Halve, between 1990 and 2015,the proportion of people whose income is less than one dollar a day.
		2. Halve between 1990 and 2015, the proportion of people who suffer from hunger.
Goal 2.		Achieve universal primary education.
Target:	*3.*	Ensure that, by 2015,boys and girls will be able to complete a full course of primary schooling.
Goal 3.		Promote gender equality and empowerment of women.
Target:	*4.*	To eliminate gender disparity in primary and secondary education preferably by 2005 and at all levels by 2015.

Goal 4. Reduce child mortality.

Target: *5.* Reduce by two-thirds between 1990 and 2015 the under-five the mortality rate.

Goal 5. Imrove maternal health.

Target: *6.* Reduce by three-quarters between 1990 and 2015 the maternal mortality ratio.

Goal 6. Combat HIV/AIDS,malaria and other diseases.

Targets: *7.* Halve halted by 2015 and begin to reverse the spread of HAV/AIDS.

8. Halve halted by 2015 and begin to reverse the incidence of malaria and other major diseases.

Goal 7. Ensure environmental sustainability.

Targets: *9.* Integrate the principles of sustainable development jnto country policies and programmes and reverse the loss of environmental resources.

10. Halve by 2015 the proportion of people without sustainable access to drinking water and basic sanitation.

11. By 2015 to have achieved a significant improvement in the lives of at least 100 million slum dwellers.

Goal 8. Develop a global partnership for development

Targets: *12.* Develop further an open,rule-based,predictable,non-dicriminatory and financial system which includes a commitment to good governance, development, and poverty reduction both national and international.

13. Adress the special needs of the least developed countries relating to tariff and quota free access for exports,enhanced program of debt relief for and cancellation of official bilateral debt, and more generous official development assistance for countries commited to poverty reduction.

14. Address the special needs of land-locked countries and small island developing states through the Program of Action for Sustainable Development of Small Island Developing States.

15. Deal comprehensively with the debt problems of developing countries through national and international measures.

16. Develop and implement strategies for decent and productive work for youth in cooperation with developing countries.
17. Provide access to affordable essential drugs in developing countries in cooperation with pharmaceutical companies.
18. Make available the benefits of new technologies,especially information and communications technologies, in cooperation with the private sector.

STRATEGIES

Strategies to achieve MDGs are as follows: (a)campaign and mobilize for the MDGs through advocacy;(b)to support government in tailoring the MDGs to local circumstances and progress report in this regard;(c) implementing and evaluation of financing options; and (d)share the best strategies for meeting the MDGs in terms of innovative manner.

Besides,the Millennium Declaration and the Monterrey Consensus specify that the primary responsibility of achieving Goals 1 to 7 and their Targets rests with developing countries.But these countries cannot achieve them without the policy changes in developed countries for aid,debt,trade and technology transfers to achieve Goal 8. The commitments by developed countries with regard to these have been detailed in Goal 8. The Monterrey Consensus called on “developed countries that have not done so to make concrete efforts towards the target of 0.7% of GNP as ODA (official development assistance) to developing countries and 0.15% to 0.20% to the least developed countries.”Similarly,the World Summit on Sustainable Development also urged developed countries to effectively implement such assistance to developing countries and least developed countries.The Doha Ministerial Declaration of WTO (World Trade Organisation) in 2001 also affirmed poverty reduction goal and committed duty –free,quota-free market access for products from the least developed countries.

HOW TO ACHIEVE THE GOALS

The following measures have been suggested to achieve the Millennium Development Goals:

Goal 1: Halving the proportion of people in extreme poverty and hunger require ambitious plans. Strong economic growth is a pre-requisite in developing and least developed countries.But mere economic growth is not enough. Rather emphasis should be on policies that include poverty-reducing growth such as (a)increasing equitable investments in basic health, education,nutrition, water and sanitation services; (b)providing skills,credit,land and other economic assets to the poor;(c)providing labour-intensive employment by promoting small and medium size enterprises; (d)helping small farmers to increase productivity and diversify by providing micro finance for implements,seeds,poultry and cattle rearing ,etc.

For halving the proportion of hungry people requires access to food in plentiful and increasing the productivity of hungry farmers.To provide plentiful food to poor farmers, governments should create buffer stocks at the local levels where such farmers live. In rural areas where landless hungry people live,they should be provided secure tenure of land

In regions where agricultural productivity is low,farmers should be made conversant with productivity increasing techniques through extension services.

Above all,increased public investments are needed on infrastructure such as roads,bridges,storages,etc. to engage disguised unemployed rural poor.

Goal 2: Achieving universal primary education is crucial for improving health,nutrition and productivity thereby meeting the other goals.Education contributes to better health and better health increases productivity that promotes economic growth. This requires spending more on primary education by the state in establishing schools throughout the country. In particular,schools should be located in areas where poor households live so that cost and time of going to schools are minimum.To make primary education universal, it should be free of costs in terms of fees,uniforms and text books.There is also the need to give mid-day meals to students because hungry children cannot learn.

To encourage parents to send their daughters to school,schooling hours should be scheduled in such a manner that girls could attend to household chores and female teachers work in schools. In places where the number of male and female students is large,there should be day-shift for girls to give parents a

sense security and evening shift for boys.

Goal 3: Promoting gender equality and empowering women are also central in achieving all other goals because women are the agents of development.Women need to be given better education health and more employment opportunities like men. Educated women bring up fewer and healthier children thereby lowering mortality and fertility rates.In many developing and less developed countries women work on the farms besides attending to household chores. If they are educated and healthier they can help in increasing farm productivity by adopting better farming techniques. This will enhance household incomes. Educated and healthier women by working outside the home increase family incomes in semi-urban and urban areas in such countries.Thus better education and good health and equal employment opportunities empower women to enhance their autonomy.

Goals 4-6: Reducing child mortality, improving maternal health and combating HIV/AIDS, malaria and other diseases require large health budgets in order to provide such basic health infrastructure as clinics,dispensaries and health care centres in rural areas, semi-urban and urban areas inhabited by the poor people. However, governments in developing and less developed countries do not have enough resources to provide these basic health facilities. So they necessitate internal and external help from private health care providers and NGOs to establish hospitals ,health care centres,etc. where medical services are provided free to poor patients and with normal charges to others.

Goal 7: Halving the proportion of poor people without access to safe drinking water and improved sanitation. Safe drinking water,improved sanitation and better hygiene are pre-requisites for better health care. But these come under municipal authorities which lack resources to finance infrastructure for these services. Supply of potable water requires water purification and bulk water transmission and distribution systems. Improved sanitation requires public sewage collection and waste water treatment systems in order to prevent raw sewage from entering rivers and contaminating ground water.These systems are also required to be maintained properly. All these services involve high costs which are beyond these means of municipal authorities.Therefore, they are required to be subsidized by the national government. The charges for these services from the people should not be too high and should be subsidized

for the poor by the state government.

However,in rural and backward regions of developing and less developed countries where it is not possible to provide such high cost infrastructure for safe drinking water and improved sanitation, low cost community services should be provided such as protected dug wells, public sandpipes, pour-flush latrines, simple pit latrines, ventilated pit latrines, connections to septic tanks and covered public sewers. These are labour-intensive services which can be provided by community involvement in such areas.

Another aspect of Goal 7 is ensuring environmental sustainability that requires managing ecosystems in order to provide services which sustain human livelihoods. To promote environmental sustainability requires policy changes in developing and developed countries and involvement of people in converting ecosystems. Some of the policy changes are :

(1) Involvement of communities in managing their environmental resources.

(2) Compliance with environmental standards.

(3) Clear property and user rights.

(4) Laying down policies relating to environmental protection, management and environment development strategies.

(5) Removing subsidies on fossil fuels, large scale commercial fishing, etc. that damage the ecosystems in developing and developed countries.

(6) Improving international management and protection of international water sheds and climate changes by sharing their cost burdens equitably among nations.

(7) Increasing investments in science and technology by developed and developing countries for renewable energy technologies.

(8) Creating an observatory for monitoring the functioning of major ecosystems.

(9) Creating an international fund to remove environmental degradation to

which developed countries should contribute more.

Goal 8: Develop a global partnership for development. This requires policy changes in develop countries for aid ,debt ,trade and technology transfers to developing and less developed countries. These are essential to achieve Goals 1-7. But as pointed out by the Millennium Declaration and the Monterrey Consensus the primary responsibility for achieving Goals 1-7 lies with developing countries. If developing countries are to achieve these Goals by 2015, developed countries should adopt the following measures:

1.AID. To fill financing gaps of developing countries, developed countries should increase total official development assistance to o.7% of gross national incomes. They should also improve their practices, especially in keeping with development priorities in developing countries to untied aid, reduce administrative burdens for them , and to decentralize.

2.Debt. To deal with debt problems of developing and Heavily Indebted Poor Countries(HIPCs) requires some debt cancellation so that their debt burdens are sustainable. For this ,developed countries should finance a compensatory financing facility for external shocks like collapses in commodity prices and shrinking export earnings of HIPCs . They should also finance large debt reduction for HIPCs when they reach their completion levels to ensure sustainability.

3. Trade. Trade policies of developed countries are discriminatory against exports of developing countries. Therefore, they should remove tariffs and quotas on exports of textiles, clothing ,and agricultural products of developing countries. Agricultural subsidies of developed countries are very high which lead to unfair competition with agricultural exports of developing countries.Developed countries should therefore remove subsidies on agricultural exports from developing countries.

4. Technology. With increased technological innovations ,developed countries should channelize them to developing countries. They should ensure their transfer, protection ,and remuneration of traditional knowledge in the TRIPS Agreement under the WTO.

IMPLEMENTATION OF MILLENNIUM DEVELOPMENT

GOALS (MDGS) IN INDIA

India's achievements with reference to the various goals and targets are given below:

Goal 1. Eradicate Extreme Poverty and Hunger. As on 1999-2000, the poverty headcount ratio was 26% with poverty gap ratio 5.2%. The following measures have been taken to reduce poverty in India (a) increase credit flow by making Kisan Credit Cards available to farmers;(b) ban on child labour; and (c) ban on bonded labour . The following schemes are in operation to reduce poverty in rural areas: Swarna Jayanti Gram Swarozgar Yojana (SGSY); Sampoorna Grameen Rozgar Yojana (SGRY); Jai Prakash Rozgar Guarantee Yojana (JPRGY); National Rural Employment Programme (NREP) ;and National Employment Guarantee Act.

Goal 2. Achieve Universal Primary Education. The Government has made free and compulsory primary education a fundamental right of children. The drop out rate for primary education was about 35% in 2002-2003.The literacy rate (7 years and above) increased from 52.2% to 65.4%. The Government has taken a major initiative by launching the Sarva Shiksha Abhiyan and National Literacy Mission which aim at universalisation of primary education in partnership with States.

Goal 3. Promote Gender Equality and Empowerment of Women. Women as an independent large group Represent 48% of the country s total population. Empowering women as a process demands a life-cycle approach.Therefore,every stage of their life cycle counts as a priority in the planning process. The female-male proportion in respect of primary education which was 71:100 in 1990-1991 had increased to 78:100 in 2002-2003. In the case of secondary education ,the proportion had

increased from 49:100 TO 63:100.

The three-fold strategy of National Policy for the Empowerment of Women includes:

(a)*Social Empowerment.*To create an enabling environment through various affirmative development policies and programmes for the development of

women besides providing them easy and equal access to all the basic minimum services so as to enable them to realize their full potential.

(b) *Economic Empowerment.* To ensure provision of training,employment and income-generation activities with both forward and backward linkages with the ultimate objective of making all potential women economically independent and self –reliant by providing reservation for women by the 73 rd and 74th Constitutional Amendments.

(c) *Gender Justice.* To eliminate all forms of gender discrimination and thus allow women to enjoy not only the *de-jure* but also *de-facto* rights and fundamental freedom on par with men in all spheres, such as political,economic,civil ,social and cultural.

Goal 4. Reduce Child Mortality. Infant and under-5 mortality rates are excellent indicators of the health status of children.This goal aims at under-5 mortality ratio from 125 deaths per 1000 live births in 1988-1992 into 42 in 2015. The under-5 mortality rate decreased to 98 per 1000 live births during 1998-2002.The infant mortality rate had also come down from 80 per 1000 live births in 1990 to 60 per 1000 in 2003.

The ongoing major child health care programmes include:(a) essential new born care; (b)immunization to prevent morbidity and mortality due to vaccine preventable diseases; (c) food and micro-nutrient supplementation programmes aimed at improving the nutritional status; and (d) programmes for reducing mortality due to acute respiratory infection (ARI) and diarrhea.

Goal 5. Improve Maternal Health. The human resource development is essential to improve maternal health. To achieve this goal, India should reduce maternal mortality rate (MMR) from 437 deaths per 10000 live births in 1991 to 109 by 2015.

Adequate skilled health personnel is essential for an efficient and effective functioning of health system. Around 7 lakh nurses have been registered in the various state councils in the country. Of these, only about 40% are active in private sector and others in government sector. The proportion of births attended by skilled health personnel increased from 25.5% in 1992-1993 to 39.8% IN 2002-2003, thereby reducing the chances of occurrence of maternal

deaths.

Goal 6. Combat HIV/AIDS Prevalence among 15 to 24 Year Old Women and other Major Diseases. So far as this goal is concerned, though India has low prevalence of HIV/AIDS among pregnant women as compared to other developing countries, yet the prevalent rate increased from 0.74 per 1000 in 2002 to 0.86 per 1000 in 2003.According to the UN 2011 Aids Report, close to 1.2 million people in India were newly infected with HIV in 2009. This increasing trend needs to be reversed. Despite this,the UN Report pointed out that there had been a 50% decline in the number of new HIV infections in the last 10 years in India.

A new scheme for HIV/AIDS among adolescents was launched in 2002 under NACP -Phase-II. It aimed at sensitizing them on issues like safe motherhood, reproductive health rights, sexuality and sexual responsibility. National AIDS Control Programme (NACP) Phase-III was launched in 2007.Under it,emphasis was also to be given on educating youth and focus on 'say no' to unsafe sexual behavior.

Goal 7. Ensure Environmental Sustainability. It includes sustainable development of energy, safe drinking water and forest resources.

(a) *Energy.* The Energy Conservation Act ,2000 was passed which led to the setting up of Bureau of Energy Efficiency that has introduced stringent energy conservation norms for energy generation ,supply and consumption.Integrated Energy Policy, 2008 aims at exploring alternative technologies and possible synergies that would increase energy efficiency and meet requirements for energy sector. One of the objectives of this policy is to set up National Energy Fund for research and development in energy sectors.

(b) *Safe Drinking Water and Sanitation.* National Water Policy ,2002 aims at providing clean drinking water and improving the quality of drinking water. Rural drinking water is one of the six components of Bharat Nirman which was started in 2005. Rajiv Gandhi National Drinking Water Mission has been started. Total sanitation campaign is currently operational in 580 districts of different states.Further, a new national urban sanitation policy was announced in October 2008.

(c) *Forest Management*. The total land area covered under different forests was 20.64% in 2003 due to government efforts.The reserved and protected forests together account for 19% of the total land area to maintain biological diversity. The Indian Biological Diversity Act,2003 and National Environment Policy ,2006 were enacted for effective management of forests and to maintain biological diversity.

Goal 8. Develop a Global Partnership for Development. The Government of India holds the following views regarding the role of developed countries in achieving this goal.

It has been India‘s consistence position that additional resources for implementing the development agenda should be channelized through the existing multilateral agencies.Moreover, allocations must be based on pre-defined and transparent criteria. India‘s development experience clearly indicates that , ultimately, it is the availability of untied additional resources for use in accordance with national development strategies , which is most beneficial for recipient countries.

With regard to one of the targets of this goal ,i.e. in cooperation with the private sector, make available the benefits of new technologies, especially information and communications, India has made substantial progress in recent years. The overall tele-density had remarkably increased from 0.67% in 1991 to 9.4% in June 2005. Use of personal computers had also increased from 5.4 million PCs in 2001 to 14.5 million in 2005 and there were 5.3 million Internet subscribers as on March 2005.

UN Report on MDGs points out that India will graduate from the needs for official development assistance well before 2015, given high level of growth.

PROGRESS OF MILLENNIUM DEVELOPMENT GOALS

We discuss the progress made towards the achievement of Millennium Development Goals by 2015.

The UN MDGs Report 2010 points out seveal major accomplishments including combating extreme poverty and hunger, improving school enrollment and child health, expanding access to clean water and HIV treatment

and controlling malaria. Specifically, the Report compares statistics in measles deaths, as the number of deaths in sub-Saharan Africa has decreased dramatically. But the Report brings bad news with the good, suggesting that progress has been uneven when comparing certain world regions. In addition to unevenness, the progress has been slow. Five major objectives are still largely unmet: poverty, global hunger, employment, access to education, and gender equality. Within each of these, some progress has been made, but the full goal has not been realized. Enrolment in primary education reached only 89% in 2008, up from 80% in 1991. But the dropout rate from primary school remained high regardless.

The Report goes into detail on significant health-related Millennium Development Goals that have been achieved. HIV infections fell 30%, deaths among children 5 and younger have deceased as well and statistics show measles are less deadly than they used to be. There have also been some areas with little progress, like neonatal infant death rates, which account for 36% of deaths for children 5 and under. Maternal mortality lacks positive progression, as maternal death rates today are the same as in 1990. The Report highlights some emerging issues that have arisen since the start of the MDG: climate change, financial markets, food security, conflict refugees; these are some challanges that have had little or no development towards the 2015 goal.

The Report further states that the global economic crisis will leave an additional 50 million people in extreme poverty in 2009 and some 64 million by the end of 2010 relative to a no-crisis scenario, principally in sub-Saharan Africa and eastern and south-eastern Asia. Moreover, the effects of the crisis are likely to persist: poverty rates will be slightly higher in 2015 and even beyond, to 2020, than they would have been had the world economy grown steadily at its pre-crisis pace.

The success of Goals 1 to 7 hinges on Goal 8 which calls for a “global partnership for development” whereby the developed countries have the obligation to finance and support developing countries to achieve the targets of MDGs. But this has not happened. The developed countries had pledged to contribute 0.7% of their GDP as aid to meet MDGs. In 2009, the Official Development Assistance (ODA) was 0.31% of GDP of developed countries. The US contributed only 0.2% of its GDP to aid and the European Union only 0.48% of its GDP. Thus the combined ODA of developed countries was 0.31%

of their GDP which was not even half of 0.7% target. Only five countries met this target of GDP aid to developing countries: Denmark, Luxumbourg, the Netherlands, Norway and Sweden.

In the area of trade also not much progress has been made. Tariffs by developed countries on their imports of agricultural products, textiles and clothing from developing countries remained between 5 and 8% in 2008 which were lower by only 2 to 3 percentage points than in 1998.

The UN Report admits that Millennium Development has been very unequal in certain regions, with countries like China making huge headway, while other countries like sub-Saharan countries have made no progress. However, it points out, “The very fact that the challenges of poverty, food, energy, global recession, and climate change are all interrelated has presented the global community with a unique opportunity to tackle them together.” For this, the developed countries should come forward to help the developing and least developed countries through aid and trade policies. As stated by UN Under-Secretary-General for Economic and Social Affairs, “Policies and interventions will be needed to eliminate the persistent or even increasing inequalities between the rich and the poor, between those living in rural or remote areas or in slums versus better-off urban populations, and those disadvantaged by geographic location, sex, age, disability or ethnicity”.

PART - VI
SOME PROBLEMS OF DEVELOPMENT PLANNING

CHAPTER

Economic Planning

MEANING OF ECONOMIC PLANNING

There is no agreement among economists with regard to the meaning of the term 'economic planning'. The term has been used very loosely in economic literature. It is often confused with communism, socialism or economic development. Any type of state intervention in economic affairs has also been treated as planning. But the state can intervene even without making any plan. What then is planning? Planning is a technique, a means to an end being the realization of certain pre-determined and well-defined aims and objectives laid down by a central planning authority. The end may be to achieve economic, social, political or military objectives. Therefore, "the issue is not between a plan and no plan, it is between different kinds of plans."[1]

Professor Lewis has referred to six different senses in which the term planning is used in economic literature. "*First*, there is an enormous literature in which it refers only to the geographical zoning of factors, residential buildings, cinemas and the like. Sometimes this is called town and country planning and sometimes just planning. *Secondly*, 'planning' means only deciding what money the government will spend in the future if it has the money to spend. *Thirdly*, a 'planned economy' is one in which each production unit (or firm) uses only the resources of men, materials and equipment allocated to it by quota and disposes of its product exclusively to persons or firms indicated to it by central order. *Fourthly*, 'planning' sometimes means any setting of production targets by the government, whether for private or public enterprise. Most governments practise this type of planning if only sporadically, and if only for one or two industries or services to which they attach special importance. *Fifthly*, here targets are set for the economy as a whole, purporting to allocate all the country's labour, foreign exchange, raw materials and other resources between the various branches of the economy." And, *finally*, "the word 'planning' is sometimes used to describe the means which

the government uses to try to enforce upon private enterprise the targets which have been previously determined."[2]

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1. L. Robbins, *Economic Policy and International* Order, p. 6.

But Ferdynand Zweig maintains that 'planning' is planning of the economy, not within the economy. It is not a mere planning of towns, public works or separate section of the national economy, but of the economy as a whole.[3] Thus planning does not mean piecemeal planning but overall planning of the economy.

Some of the definitions of economic planning are:

Professor Robbins defines economic planning as "collective control or supersession of private activities of production and exchange."

To Hayek, planning means, "the direction of productive activity by a central authority."

According to Dalton, "Economic planning in the widest sense is the deliberate direction by persons incharge of large resources of economic activity towards chosen ends."

Lewis Lordwin defines economic planning ,"as a scheme of economic organization in which individual and separate plants, enterprises, and industries are treated as coordinate units of one single system for the purpose of utilizing available resources to achieve the maximum satisfaction of the people's needs within a given time."

In the words of Zweig, "Economic planning consists in the extension of the functions of public authorities to organization and utilization of economic resources...Planning implies and leads to centralization of the national economy."

One of the most popular definitions is by Dickinson who defines planning as "the making of major economic decisions what and how much is to be produced, how, when and where it is to be produced, to whom it is to be allocated, by the conscious decision of a determinate authority, on the basis of

comprehensive survey of the economic system as a whole."

Even though there is no unanimity of opinion on the subject, yet economic planning as understood by the majority of economists implies *deliberate control and direction* of *the economy by a central authority for the purpose* of *achieving definite targets and objectives within a specified period* of *time.*

NEED FOR PLANNING IN UNDERDEVELOPED COUNTRIES

1. To Increase the Rate of Economic Development. One of the principal objectives of planning in underveloped countries is to increase the rate of economic development. In the words of D.R. Gadgil, "Planning for economic development implies external direction or regulation of economic activity by the planning authority which is in most cases, identified with the government of the state."[4] It means increasing the rate of capital formation by raising the levels of income, saving and investment. But increasing the rate of capital formation in underdeveloped economies is beset with a number of difficulties. People are poverty-ridden. Their capacity to save is extremely low due to low levels of income and high propensity to consume. As a result, the rate of investment is low which leads to capital deficiency and low productivity. Low productivity means low income and the vicious circle is complete. This vicious economic circle can only be broken by planned development. Two methods are open to underdeveloped countries. One is planned development by importing capital from abroad which Zweig calls 'supported industrialization,' and the other is by forced saving which he characterises as 'self-sufficient industrialization'.

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2. W.A. Lewis, *The Principles of Economic Planning,* 1954.

3. F. Zweig, *Planning of Free Societies,* p. 14.

4. D.R. Gadgil, *Planning and Economic Policy in India,* p. 88.

2. To Improve and Strengthen Market Mechanism. The rationale for planning arises in such countries to improve and strengthen the market mechanism. The market mechanism works imperfectly in underdeveloped countries because of the ignorance and unfamiliarity with it. A large part of the economy comprises the non-monetised sector. The product, factor, money and

capital markets are not organised properly. Thus the price system exists in only a rudimentary form and fails to bring about adjustments between aggregate demand and supply of goods and services. To remove market imperfections, to mobilise and utilise efficiently the available resources, to determine the amount and composition of investment, and to overcome structural rigidities, the market mechanism is required to be perfected in underdeveloped countries through planning.

3. To Remove Unemployment. The need for planning in underdeveloped countries is further stressed by the necessity of removing widespread unemployment and disguised unemployment in such economies. Capital being scarce and labour being abundant, the problem of providing gainful employment opportunities to an ever-increasing labour force is a difficult one. It is only a centralized planning authority which can solve this.

4. Balanced Development of the Economy. In the absence of sufficient enterprise and initiative, the planning authority is the only institution for planning the balanced development of the economy. For rapid economic development, underdeveloped countries require the development of the agricultural and industrial sectors, the establishment of social and economic overheads, the expansion of the domestic and foreign trade sectors in a harmonious way. All this requires simultaneous investment in different sectors which is only possible under development planning.

(a) Development of Agricultural and Industrial Sectors. The need for developing the agricultural sector along with the industrial sector arises from the fact that agriculture and industry are interdependent. Reorganisation of agriculture releases surplus labour force which can be absorbed by the industrial sector. Development of agriculture is also essential to supply the raw material needs of the industrial sector.

(b) Development of Infrastructure. The agricultural and industrial sectors cannot, however, develop in the absence of economic and social overheads. The building of canals, roads, railways, power stations, etc., is indispensable for agricultural and industrial development. So are the training and educational institutions, public health and housing for providing a regular flow of trained and skilled personnel. But private enterprise in underdeveloped countries is not interested in developing the social and economic overheads due to their

unprofitability. It is motivated by personal gain rather than by social gain. It, therefore, devolves on the state to create social and economic overheads in a planned way.

(c) Development of Money and Capital Markets. Similarly, the expansion of the domestic and foreign trade requires not only the development of the agricultural and industrial sectors along with social and economic overheads but also the existence of financial institutions. Money and capital markets are undeveloped in underdeveloped countries. This factor acts as an obstacle to the growth of industry and trade. There is economic instability generated by international cyclical movements. Such maladjustments can only be removed by the state. It can decide upon the setting up of a central bank and with its help a bill market, commercial banks and other financial institutions throughout the country. It is the planning authority which can control and regulate the domestic and foreign trade in the best interests of the economy.

5. Removing Poverty and Inequalities. The planning for development is indispensable for removing the poverty of nations. For raising national and per capita income, for reducing inequalities in income and wealth, for increasing employment opportunities, for all-round rapid development and for maintaining their newly won national independence, planning is the only path open to underdeveloped countries. There is no greater truth than this that the idea of planning took a practical shape in an underdeveloped country and that this is the only hope of the resurgent underdeveloped countries of the world. The rapid development of the USSR, a poor country at the time of the October Revolution, bears testimony to this fact.

To conclude with Prof. Gadgil, "Planning, therefore means, in a sense, no more than better organization, consistent and far-seeing of organisation and comprehensive all-sided organization. Direction, regulations, controls on private activity, and increasing the sphere of public activity, are all parts of organizational effort."[5]

PLAN FORMULATION AND REQUISITES FOR SUCCESSFUL PLANNING

The formulation and success of a plan require the following:

1. Planning Commission. The first prerequisite for a plan is the setting up of a planning commission which should be organised in a proper way. It should be divided and sub-divided into a number of divisions and sub-divisions under such experts as economists, statisticians, engineers, etc. dealing with the various aspects of the economy.

2. Statistical Data. A prerequisite for sound planning is a thorough survey of the existing and potential resources of a country together with its deficiencies. As Baykov puts it: "Every act of planning, in so far as it is not mere fantastic castle building presupposes a preliminary investigation of existing resources."[6] Such a survey is essential for the collection of statistical data and information with regard to the total available material, capital and human resources of the country. Data pertaining to the available and potential natural resources along with the degree of their exploitation, agricultural and industrial output, transport, technical and non-technical personnel, etc. are essential for fixing targets and priorities in planning. It, therefore, requires the setting up of a central statistical organization with a network of statistical bureaux for collecting statistical data and information for the formulation of the plan

3. Objectives. The plan may lay down the following objectives: to increase national income and per capita income; to expand employment opportunities; to reduce inequalities of income and wealth and concentration of economic power; to raise agricultural production; to industrialise the economy; to achieve balanced regional development; to achieve self-reliance, etc. The various goals and objectives should be realistic, mutually compatible and flexible enough in keeping with the requirements of the economy.

4. Fixation of Targets and Priorities. The next problem is to fix targets and priorities for achieving the objectives laid down in the plan. They should be both global and sectorial. Global targets must be bold and cover every aspect of the economy. They include quantitative production targets, so many metres million tons of foodstuffs, coals, steel, fertilizers, etc., so many kilowatts of power capacity, so many metres of railways and roads, so many additional training institutions, so much increase in national income, saving, investment, etc. There are also sectoral targets pertaining to individual industries and products in physical and value terms both for the private and public sectors.

Global and sectoral targets should be mutually consistent in order to attain the required growth rate for the economy. This necessitates determining priorities. Priorities should be laid down on the basis of the short-term and long-term needs of the economy keeping in view the available material, capital and human resources.

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5. Ibid.

6. *The Developing of the Soviet Economic System*, p. 427.

Such schemes or projects which are required to be executed first, should be given top priority while the less important should have a low priority. The scheme of priorities should not be rigid but may be changed according to the requirements of the country. Thus "sound governmental planning consists of establishing intelligent priorities for the public investment programme and formulating a sensible and consistent set of public policies to encourage growth in the private sector."[7]

5. Mobilisation of Resources. A plan fixes the public sector outlay for which resources are required to be mobilised. There are various internal and external resources for financing a plan. Savings, profits of public enterprises, net market borrowings, taxation and deficit financing are the principal internal sources of finance for the public sector. Net budgetary receipts corresponding to external assistance relate to the external sources of financing the plan. The plan should lay down such policies and instruments for mobilising resources which fulfil the financial outlay of the plan without inflationary and balance of payments pressures. At the same time, they should encourage corporate and household savings of the private sector.[8]

6. Balancing in the Plan. A plan should ensure proper balance in the economy, otherwise shortages or surpluses will arise as the plan progresses. There should be balance between saving and investment, between the available supply of goods and the demand for them, between manpower requirements and their availabilities, and between the demand for imports and the available foreign exchange.

Aggregate savings come from various sources such as voluntary savings, taxation, profits of public enterprises, foreign remittances by nationals, etc.

These must equal planned aggregate investment in fixed capital assets and inventories in the economy. The balance between the supply and demand for goods requires balancing of the available supply of consumption goods with their demand, of the supply of capital goods, materials and inventories with their requirements, of the supply of intermediate goods with their demand, and the proposed requirements of exports of goods with their supplies. Balances are also required between planned demand and supply of manpower, and between import requirements and the available foreign exchange during the plan period,

In fact, two kinds of balances must be secured in a plan. The first is the physical balance which consists of balancing the planned increase in output of various goods with the amounts and types of investment. It also requires the balancing of the outputs of the various sectors of the economy. This is achieved through the input-output technique because the output of one sector or industry is the input of the other for producing its output. Physical balancing is essential for the internal consistency of the plan, otherwise such physical obstacles as lack of raw materials, manpower, etc. will develop in the economy. The second is the monetary or financial balance which consists of balancing the incomes of the people with the amount of goods available to them for consumption, the funds used for private investment and the amount of investment goods available to private investors, the funds used for public investment and the amount of investment goods produced by the public sector, and the balancing of foreign payments and receipts. The lack of these financial balances will lead to disequilibrium in the supply and demand for physical goods thereby leading to inflationary and balance of payments pressures during planning.

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7. W. A. Lewis, *Development Planning*, 1966.

8. For problems of resource mobilisation refer to chapters in parts Four and Five of the book.

7. Incorrupt and Efficient Administration. A strong, efficient and incorrupt administration is the *sine qua non* of successful planning. But this is what an underdeveloped country lacks the most. Lewis regards a strong, competent and incorrupt administration as the first condition for the success of a plan. The Central Cabinet in an underdeveloped country should not take important economic decisions hurriedly without getting them properly examined from technical advisers. Competent administrative staff should be appointed in

various ministries which should first prepare good feasibility reports of proposed projects before starting them. It should gain experience in planning and starting a project, keeping it on schedule, amending it in case of some unexpected snags, and evaluating it from time to time. Without such administrative machinery, development planning has no *locus standi* in an underdeveloped country. Lewis is very emphatic when he writes, "In the absence of such an administration it is often much better that governments should be laissez-faire than they should pretend to plan." The phenomenal success of development planning in Russia can be attributed to "a highly trained and disciplined priestly order of the Communist Party. The economics of development is not very complicated; the secret of successful plan lies more in sensible politics and good public administration."[9]

8. Proper Development Policy. The state should lay down a proper development policy for the success of a development plan and to avoid any pitfalls that may arise in the development process. Lewis lists the following main elements of such a development policy: (i) investigation of development potential, survey of national resources, scientific research, market research; (*i*) provision of adequate infrastructure (water, power, transport, and communications) whether by public or private agencies; (*iii*) provision of specialized training facilities, as well as adequate general education, thereby ensuring necessary skills; (*iv*) improving the legal framework of economy activity, especially laws relating to land tenure, corporations , commercial transactions; (*v*) helping to create more and better markets including commodity markets, security exchanges, banking, insurance and credit facilities; (*vi*) seeking out and assisting potential entrepreneurs, both domestic and foreign; (*vii*) promoting better utilization of resources, both by offering inducements and by operating controls against misuse; and (*viii*) promoting an increase in saving, both private and public." The success of a development plan can be tested mainly by examining various proposals under each of these heads. Good polices help, but they may not ensure success. Lewis, therefore, likens development planning to medicine which in the hands of a good practitioner may perform useful tricks, "but it is still the case that many patients die who are expected to live, and many live who are expected to die."[10]

9. Economy in Administration. Every effort should be made to effect

economies in administration, particularly in the expansion of ministries and state departments. "The people must feel confident that every pie that they pay to the government through taxation and borrowings is properly spent for their welfare and development, *and not dissipated away.*"[11]

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9. W.A. Lewis, *The Principles of Economic Planning*, 1954 and *Development Planning*, 1966.

10. *Development Planning*, pp. 22-23

11. Shriman Narayan, *Trends in Indian Planning*, p. 36. Italics mine.

10. An Education Base. For a clean and efficient administration, a firm educational base is essential. Planning to be successful must take care of the ethical and moral standards of the people. One cannot expect economy and efficiency in administration unless the people possess high ethical and moral values. This is not possible unless a strong educational base is built up whereby instructions are imparted both in the academic and technical fields. Without creating honest and efficient human beings in the country, it would not be feasible to undertake economic planning on a big scale.

11. A Theory of Consumption. According to Professor Galbraith,[12] an important requirement of modern development planning is that it has a theory of consumption. Underdeveloped countries should not follow the consumption patterns of the more developed countries. The theory of consumption should be democratic and "prime attention must be accorded to goods that are within the range of the model income that can be purchased by the typical family... Cheap bicycles in a low-income country are thus more important than cheap automobiles. An inexpensive electric lighting system for the villages is better than a high capacity system which runs equipment, the people cannot afford. Inexpensive radio sets are important, television belongs to another day. Above all, nothing is so important, as abundant and efficiently produced food, clothing and shelter, for these are the most universal of requirements."

12. Public Cooperation. Above all, public cooperation is considered to be one of the important levers for the success of the plan in a democratic country. Planning requires the unstained cooperation of the people. Economic planning should be above party politics, but at the same time, it should have the approval of all the parties. In other words, a plan should be regarded as a National Plan

when it is approved by the representative of the people. For, without public support no plan can be success. As Lewis states: "Popular enthusiasm is both the lubricating oil of planning and the petrol of economic development, a dynamic force that makes all things possible."[13]

PROBLEMS OF DEVELOPMENT PLANNING

Development planning has to face the following problems:

1. Inadequate Statistical Data. One of the major problems of development planning has been the inadaquacy of statistical data concerning all aspects of the economy. There are gross errors in the estimation of accurate data in many fields of the economy, such as population, capital, labour, employment, input-output coefficients, exports and imports, etc.

2. Problems of Macroeconomic Estimates. In a development plan, macroeconomic estimates are made on the most desirable time path of total national product or income, total savings and total investment. For instance, at the time of formulation of the plan, these figures are knows for a base year. The problem is to find the optimum level of total savings or the saving income ratio. The optimum level is that in which it is desirable to save more or less in the economy. But it is not possible to arrive at such an optimum level of savings.

3. Limitations of the Use of Models. Another problem is the use of models mostly of the Tinbergen type. These models require specific targets and instruments to attain stated objectives. These objectives have to be made in some kind of index and there have to be as many instruments as there are independent targets. This is a complex process and also misleading, as the plan is often a political document of the ruling party. Further, targets and instruments are not really separable as in the case of taxation, exchange rates, etc., though they change in the process of planning.

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12. J.K. Galbraith, *Economic Development in Perspective*, 1962.

13. *Principles of Economic Planning*, op.cit., p. 128.

4. Constant Prices. A development plan is based on the assumption that prices

remain constant during the plan period. In this case, estimates are likely to go awry because price changes are inevitable under development planning. Price changes may be related to internal factors, to rise in exports or/and rise in import prices. Moreover, pricing of products and services are not linked with the physical or financial outlays of the plan which make the calculation of physical or financial targets and their achievements unrealistic.

5. No control over Private Sector Plan. A development plan provides for schemes of allocations for both public and private sectors. Since the government is not in a position to fully control the private sector, the plan relating to the private sector is never implemented as per the physical targets and financial allocations. This creates problems for the success of the plan.

6. Constant Capital-Output Ratio. A development plan assumes a constant capital-output ratio. The capital-output ratio is an important element on which the projections of a plan are based. It tells that each addition to the capital stock leads to a proportional addition to the national product. In an underdeveloped country, the capital-output ratio is not calculable in a meaningful way. In the earlier stages of development, it is usually more than assumed and as the economy develops, it starts declining. Moreover, a country that uses large amounts of foreign capital, the capital-output ratio may be considerably higher than the assumed ratio. If the country has capital-intensive long-gestation projects, the capital-output ratio will be much higher.

7. Problem of Fixed Relation between Factor Inputs and Outputs. A major problem in plan models is that they assume a fixed relationship between factor inputs and outputs. In fact, their relationships are variable within a wide range. The inputs in underdeveloped countries are scarce. So the outputs are not rigidly related to such inputs. Rather, there are other important factors that affect outputs.

8. Lack of Coordination between Plan Policies and Annual Budgets. There are many institutional rigidities and scarcities in underdeveloped countries which lead to lack of coordination between plan policies and annual budgets. Consequently, the annual budget does not reflect and implement the plan policies. This is a serious problem of development planning.

9. Problem of Balancing the Plan. Another problem is balancing of physical

and financial plans and of different segments of the economy. It is not possible to attain internal consistency in an underdeveloped country due to such factors as the availability of resources, technical progress, rate of investment, etc. The level of technology needed for achieving the various targets laid down in the plan may be low. Unexpected failure of crops may restrict the supply of farm products. Industrial production may fall due to the shortage of power.

10. Uncertainties. A development plan faces many uncertainties which make it difficult to implement it. These may arise due to foreign exchange crisis or balance of payments problem, unreliable statistical data, inflationary pressures, international recession, internal unrest, disputes with neighbouring countries, etc. Such uncertainties create problems in plan implementation.

PLANNING BY DIRECTION AND PLANNING BY INDUCEMENT

Professor Lewis draws a distinction between planning by direction and planning by inducement for the purpose of mobilizing resources of the plan.

PLANNING BY DIRECTION

Planning by direction is an integral part of a socialist society like that of China and Russia. It entails complete absence of laissez-faire. There is one central authority which plans, directs, and orders the execution of the plan in accordance with pre-determined targets and priorities. Such planning is comprehensive and encompasses the entire economy. As Lange has stated: "With regard to the socialist sector the national plan represents a binding directive. The targets of the national plan and its financial provision represent orders to be carried out of the various ministries and the enterprises subject to them. They are duty bound to carry out the directives of the plan." The State holds the "commanding posts" in its hands by taking over the entire private industrial and agricultural sectors, and banking and transport. "Without such concentration the State would lack the means to carry out the tasks of the plan. Provisions in the plan would be mere "pious wishes" without any guarantee of realization attached to them."[15]

Its Drawbacks. But planning by direction has got some drawbacks.

First, planning by direction is associated with a *bureaucratic and totalitarian regime*. There is complete absence of consumers' sovereignty. People are not allowed to spend and consume according to their choice. Even the right to choose one's occupation does not exist. Both the consumer and labour markets are determined by the planning authority. Rationing and price controls are the main props of planning by direction which lead to corruption and nepotism. Thus there is no economic freedom. As aptly pointed out by Hayek, "Economic planning would involve directions of almost the whole of our life. There is hardly any aspect of it, from our primary need to our relations, with our family and friends, from the nature of our work to the use of our relations, with our family and friends, from the nature of our work to the use of our leisure, over which the planner would not exercise his conscious control."[16]

Secondly, planning by direction is always *unsatisfactory* because the present economic system is exceedingly complex. In order to increase the output of a commodity, planning requires the increase in the output of all complementaries or a reduction in the output of substitutes. And when such decisions are to be taken in the case of innumerable commodities, it becomes an extremely difficult task, and targets are never fulfilled. As Lewis remarks, "In planning by direction the result is always a shortage of some things, and a surplus of others."

Thirdly, planning by direction is always *inflexible*. Once a plan has been drawn, it becomes impossible to revise any part of it, necessitated by circumstances. For, it is an extremely difficult task to alter a part of the plan without altering the whole of it. So the plan has to be carried through as an integrated whole despite the various pitfalls.

Fourthly, as a corollary to the above, as the plan proceeds the fulfillment of *targets* under planning by direction becomes a difficult task. The more one tries to overcome the difficulties of planning by direction, the more costly the fulfillment of targets become in terms of resources.

Fifthly, planning by direction develops what Lewis calls the 'tendency to procrustean" (have one type or size). It leads to excessive standardization because it makes production process easy. A standardized product is manufactured without any varieties. Lewis maintains that "standardization is

frequently an engine of progress, but it is also frequently the enemy of happiness, and in foreign trade it is in many lines fatal to success." Moreover, production of only one type of standard good in each line of production is inimical to the growth of initiative and enterprise. There is no urge to innovate.

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15. O. Lange, *Essays on Economic Planning*, pp. 14-16

16. F. W. Hayek, *Road to Serfdom.*

Lastly, planning by direction is a costly affair. It requires an army of clerks, statisticians, economists, and other trained personnel. Large funds are spent on conducting innumerable surveys and censuses.

Despite all these defects in planning by direction, the experience of China and Russia is a clear testimony to the fact that this type of planning is the most effective technique for accelerating the growth rate of the economy.

PLANNING BY INDUCEMENT

Planning by inducement is democratic planning. It means planning by manipulating the market. There is no compulsion but persuasion. There is freedom of enterprise, freedom of consumption and freedom of production. But these 'freedoms' are subject to state control and regulation. People are induced to act in a certain way through various monetary and fiscal measures. If the planning authority wishes to encourage the production of a commodity, it can give subsidy to the firms. And if it finds scarcity of goods in the market, it can introduce price control and rationing. In order to increase the rate of capital formation, the planning authority can then undertake public investment and/or encourage private investment. It can adopt a suitable monetary policy and at the same time a taxation policy which encourages investment and discourages consumption.

Thus planning by inducement is able to achieve the same results as are likely to be achieved in planning by direction but with less sacrifice of individual liberty.

Its Difficulties. But planning by inducement is beset with a number of difficulties which may make it less successful as compared to planning by

direction.

(*i*) It is maintained that the incentives offered may not be adequate for the producers and consumers to act the way the state desires them to behave. It may upset the government plans.

(*ii*) Since the actual working of the plan is left to the market forces, surpluses or shortages are bound to arise. Proper adjustment between demand and supply is difficult to achieve. Shortages are frequent and they necessitate price control and rationing which are the forms of direction. In such a situation, planning by inducement merges into planning by direction.

(*iii*) Similarly, monetary and fiscal measures alone are inadequate to induce planned development of the economy by raising the rate of capital formation. It is very difficult to raise the rate of capital formation in an underdeveloped country because of the low levels of income and saving. People have a tendency to utilize their savings in unproductive channels. On the other hand, planning by direction is more useful for this purpose.

CONCLUSION

Whether a country should adopt the method of planning by direction or planning by inducement depends entirely on the system of government. A full-fledged socialist country will adopt planning by direction. On the other hand, a capitalist economy will adhere to the technique of the planning by inducement.

But both these planning techniques are complementary. They cannot be placed into water-tight compartments. Both of them are indispensable and at the same time practicable in underdeveloped countries. The state alone is incapable of developing the economy in such countries. It lacks not only in financial but also in administrative resources. So it leads the private sector to work and expand under its direction and control. For this, inducements can be given in the form of subsidies and tax exemptions. Savings, investment, consumption and productions can be directed into right directions. The state can obtain resources through deficit financing, borrowing and taxation. It can also set up basic and heavy industries and undertake social and economic overheads. Thus the best course for an underdeveloped country is to have a judicious blending of the two.

India has adopted a middle course of action in her development plans, a mixed economy in which both planning by direction and planning by inducement are playing their respective roles.

FINANCIAL AND PHYSICAL PLANNING

Financial planning refers to the technique of planning in which resources are allocated in terms of money while physical planning pertains to the allocation of resources in terms of men, materials and machinery .

FINANCIAL PLANNING

Finance is the main key to economic planning. If sufficient finances are available, it is not difficult to achieve physical targets. But without the stipulated financial resources, it is not possible to carry the plan to its successful culmination. Financial planning is essential in order to remove maladjustments between supplies and demands and for calculating costs and benefits of the various projects. The Indian Planning Commission points out that: "The essence of financial planning is to ensure that demands and supplies are matched in a manner which exploits physical potentialities as fully as possible without major and unplanned changes in the price structure."[17]

In the case of financial planning "the outlay is fixed in terms of money and the estimates are made on the basis of various hypotheses regarding the growth of the national income, consumption, imports, etc., to cover this outlay by taxation, savings and the increase in the cash holding. This consists in establishing an equilibrium between the incomes of the population—wages, incomes of peasants and others—and the amount of consumers goods which will be available to the population... Further it must establish equilibrium between that part of incomes of the population which will be used for private investment and the amount of investment goods made available to private investors. Finally, in the public sector a balance must be established between the financial funds made available for investment purposes and the amount of investment goods which will be produced or imported. In addition to these balances, it is necessary to establish the balances of foreign payments and receipts."[18] Financial planning is thus thought to secure a balance between demands and supplies, avoid inflation and bring about economic stability.

Its Limitations. But this appears to be an exaggerated view, for financial planning has its limitations in an underdeveloped country.

First, measures to mobilize financial resources through taxation may adversely affect the propensity to save.

Secondly, in an underdeveloped country there is a vast subsistence non-monetized sector and a small organized money sector. Thus there is bound to be an imbalance between the two sectors. This will lead to shortages in supplies and to an inflationary rise in prices. As a result, physical targets are likely to be upset.

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17. *Second Five-Year Plan*, p. 16.

18. O. Lange, *Economic Development, Planning and International Cooperation*, 1961.

Thirdly, it is possible that supplies can be increased through imports, but they will lead to balance of payments difficulties from which underdeveloped countries already suffer.

Fourthly, financial planning is not free from various bottlenecks, especially inflationary rise in prices. It is, therefore, more appropriate to use it in sectoral planning rather than in overall planning.

Lastly, financial planning is unsuited to an underdeveloped economy where this "means not merely loss of potential income but also a threat to the character of balanced social development because it results in an insufficient provision of employment at average wages relative to the increase in the population and thus increases inequality between those who are privileged to obtain employment and those whose needs both for work and income necessarily remain unmet."

PHYSICAL PLANNING

Physical planning "is an attempt to work out the implications of the development effort in terms of factor allocations and product yields so as to maximize incomes and employment."[19] "The physical balance consists in a proper evaluation of the relations between investment and output... Investment

coefficients are computed. These coefficients indicate the amount of investment and also the composition of that investment in terms of various kinds of goods needed in order to obtain an increase of output of a product by a given amount. For example, how much iron, how much coal, how much electric power is needed in order to produce an additional ton of steel. On this basis, the planned increase in output of various products is balanced with the amounts and types of investment. It is also necessary to balance the outputs of the various sections of the economy because the output of one branch of the economy serves as an input for producing the output of another branch." Financial planning is only a means to achieve this end. Lack of financing to carry out an investment project in an underdevelped country ordinarily does not reflect the lack of physical resources but in physical planning an overall assessment is made of the available real resources such as raw materials, manpower, etc., and how they have to be obtained so that bottlenecks may not appear during the working of the plan. Physical planning requires the fixation of physical targets with regard to agricultural and industrial production, sociocultural and transportation services, consumption levels and in respect of employment, income and investment levels of the economy. There must be proper balances in the various targets set in the plan. Moreover, physical planning has to be viewed as an overall long-term planning rather than a short-term piecemeal planning. Professor Balogh stresses the importance of physical planning in these words: "The only politically sound and morally responsible strategy involves steady pressure up to the limits of physical resources. It involves hair-sharp sectoral balance and concentration of attention on the widening of supply bottlenecks as they arise. The soundness of a plan from a national point of view can be tested only by the strain it causes. A lessening of strain, the accumulation, for instance, of foreign reserves, means that the system is not being driven to the utmost of its physical capacity."[20]

Its Limitations. But physical planning has certain limitations in an underdeveloped country.

First, the most formidable problem in such economies is the lack of statistical data and information with regard to the available physical resources. If physical targets are fixed beyond the availability of resources on the basis of inaccurate data, planning will end in a fiasco.

Secondly, another problem is that of balancing the different segments of the economy. It is not possible to attain internal consistency of a high order in an underdeveloped country due to its inherent structural difficulties. The country may not have reached that state of technology needed for achieving the targets laid down. There may be unexpected failure of harvests thus restricting the supply of agricultural commodities. Or, industrial production itself may fall due to the shortage of power supply.

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19. *Second Five-Year Plan, op.cit.,* p. 14.

20. *Notes on Indian Economic Strategy* (Mmg. ISI).

Thirdly, such shortages in physical targets are bound to lead to inflationary pressures through an increase in prices. An inflationary process is extremely harmful for an underdeveloped economy where levels of income and saving are already very low.

Lastly, physical planning without financial planning is always a negation of planning in an underdeveloped country. If plans are drawn on the basis of physical resources without any regard to the availability of financial resources, plan targets can never be fulfilled. In India, due to the lack of financial resources in the closing year of the Second Plan, the size of the plan had to be pruned to the turn of Rs 200 crores, the extent of financial shortage.

CONCLUSION

Now the question is should an underdeveloped country adopt the technique of financial planning or physical planning? The answer to this question depends on the political structure of the state. In socialist states like Russia, these is physical planning. Since there is the absence of private property and all the resources belong to the state, finance never acts as a bottleneck. “Lack of finance to carry out an investment project reflects lack of physical resources to do so or an allocation decision to use these resources elsewhere in the national economy. The financial part of planning is only an instrument of social accounting in a socialist state.” It is meant to translate the values of inputs and outputs in terms of money to calculate costs, profits, incomes and prices.

In a capitalist country, financial planning is as much important as physical

planning. Both are complementary. Both are mutually consistent. For effective planning, both are needed together. As Mahalanobis pointed out: “The physical targets of production must be balanced in terms of physical quantities of raw materials, machinery, energy, transport, etc., and also in terms of manpower and of the flow of money. Incomes are generated in the very process of production, and supplies are utilized through market operations. Planning requires that aggregate income should be balanced with expenditure, savings should match investments, and the supply and demand of individual goods and services should be balanced in terms of money so as to avoid any inflationary rise in prices or undesirable shifts in prices, physical and financial planning are different asperts of the same reality.”

Thus both the techniques are required to be integrated in development planning. Physical targets should be balanced in terms of the available financial resources, while larger financial resources should be mobilized in order to fulfil physical targets for accelerating the pace of development.

PERSPECTIVE PLANNING AND ANNUAL PLANNING

The phrase ‘perspective planning’ refers to long-term planning in which long range targets are set in advance for a period of 15, 20 or 25 years. A perspective plan, according to the Indian Planning Commission, “is a blueprint of developments to be undertaken over a longer period.” A perspective plan, however, does not imply one plan for the entire period of 15 or 20 years. In reality, the broader objectives and targets are to be achieved within the specified period of time by dividing the perspective plan into several *short-period* plans of four, five or six years. Compared with the perspective plan, the short-period plan makes for greater precision. It is easier to look ahead over short periods than over very long periods. Moreover, many unpredictable changes can vitiate the long-term data. Therefore, a perspective plan is always split up into short-term plans. Not only this, a five-year plan is further broken up into *annual* plans so that each annual plan fits into the broad framework of the five-year plan. Plans of either kind are further divided into regional and sectional plans. *Regional* plans pertain to regions, districts and localities being further split up into sectional plans for agriculture, industry, foreign trade, transportation, etc. These *sectional* plans are divided into further sub-plans for each branch such as a plan for food grains, a plan for iron and steel, a plan for

exports and so on. All these plans and sub-plans are related to the perspective plan. A perspective plan reflects long-term targets, while the current plans and sub-plans are the necessary support for the former to achieve those targets. "Planning is a continuous process and cannot be isolated for short periods. Thus, *the present* Five- Year Plan is a projection and continuation of *the previous* plans, and it will lead to the *subsequent* plans. Planning is a continuous movement towards desired goals and because of this, all major decisions have to be made by agencies informed of these goals and the social purpose behind them. Even in considering a five-year period, forward and long-term planning has always to be kept in view. Indeed perspective planning is the essence of the planning process."[21]

"The main purpose of a perspective plan is thus to provide a background to the shorter-term plans, so that the problems that have to be solved over a very long period can be taken into account in planning over a shorter term. Above all one can express in a perspective plan those forces, the effects of which can be estimated with reasonable certainty over long periods. These include growth of population, the influence of education, which is only apparent over long periods, and the growth of general technological factors which have been shown in the past as a measure of regularity. Factors that are exposed to rapid changes, such as harvest yields, which are dependent on the weather, and other factors that are exposed to fruitous or irregular fluctuations cannot be, and for the most part also do not need to be taken into account."[22] Mahalanobis observes that perspective planning is necessarily a continuing process and has two broad aspects. One is current planning directed to projects included in the annual plans within the framework of the five-year plan. The successive five-year plans themselves would have to be fitted into a larger framework of perspective planning with a wide time horizon of 10, 20 or 30 years or even more. Perspective planning would be primarily concerned with the technical and scientific aspects of long-term growth of the economy. Studies and researches would be directed to solving practical problems and would be broadly of a type of operational research (although some problems of basic research would no doubt arise from time to time). This would call for the active cooperation of a large number of engineers, technologists, economists, statisticians and workers in practically all fields of both natural and social sciences."[23] There is *Perspective Planning Division* in the Planning

Commission of India which is entrusted with the task of perspective planning.

The idea of perspective planning was mooted in 1920 with the launching of the first long-term plan for the electrification of Russia— the famous GOELRO plan. Up to 1958, Russia had been having five-year plans for its economic development. But in 1959, it embarked upon a twenty-year plan for 1960-80, the target figures for 1959-65 having been regarded as an integral element of their long-term plan for economic development. In India also, the five-year plans visualize the problem of economic development from a longer perspective.

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21. *Third Five-Plan*. Italics mine.

22. J. Tinbergen, *Development Planning*, 1976. Italics mine.

23. P.C. Mahalanbis in *Sankhaya*, December 1955.

Demerits of Perspective Planning. Planning for fixed periods is essential to start with because it goads the people and the government to move on the path laid down in the perspective plan. But it is not without certain serious demerits.

First, such a plan is rigid because necessary or desirable adjustments to unforeseen changes or corrections of errors may not be made, and the adaptations that are made will tend to occur abruptly between plan periods. Thus it is not feasible administratively.

Secondly, "psychologically... the compulsion to revise the plan downward when no formal provision for this is made can have demoralizing effects. This is illustrated by the experience in India after 1957, when those in authority issued contradictory statements and were even tempted into pious falsification of the facts. This tended to spread confusion, cynicism, and defeatism in business, in the administration, and among the public. More flexible planning could have prevented some of the miscalculations of foreign exchange requirements and some of the faults in the handling of import licences in the beginning of this period." According to Myrdal, perspective planning should, therefore, be started during an experimental period.[24]

INDICATIVE PLANNING AND IMPERATIVE PLANNING

INDICATIVE PLANNING

Indicative planning prevails in France. This type of planning is not imperative but flexible. Planning in socialist countries is comprehensive in which the planning authority decides about the amount to be invested in each sector, in fixation of prices of products and factors, and the types and quantities of products to be produced. There being rigidity in this type of planning if there is some distortion in one sector, it adversely affects the entire economy which cannot be remedied immediately. The French system of Planning is free from all such troubles because it is based on the principle of decentralization in the operation and execution of the national plans. It is known as indicative or soft planning as distinct from comprehensive or imperative planning.

Indicative planning is peculiar to the mixed economy of France and is quite different from the type of planning that prevails in the other mixed economies of the world. In a mixed economy, the public and private sectors work together. The state controls and regulates the private sector in a number of ways so that the private sector may cooperate in fulfilling the targets and priorities of the plan. The usual methods to control this sector are licences, quotas, price and quantity determination of products, financial aid, etc. It has to work under the direction of the state. But in indicative planning the private sector is neither rigidly controlled nor directed to fulfil the targets and priorities of the plan. Even then, the private sector is expected to fulfil the targets for the success of the plan. The state provides all types of facilities to the private sector but does not direct it, rather indicates the areas in which it can help in implementing the plan.

Indicative planning has been in use in France since the Monnet Plan of 1947-50. In the French system of planning, the public sector comprises *basic sectors* like coal, cement, steel, transportation, fuel, fertilizers, farm machinery, electricity, tourism, etc. In these sectors, the fulfilment of production and investment targets is imperative. Besides, there are certain *basic actions* which are considered essential for the operation of the basic sectors and are, therefore, directly under the state. They are: (*i*) the development of scientific and technical research including atomic energy; (*ii*) reduction of costs through rationalization and long-term programming; (*iii*) specialization and regrouping of industrial concerns; (*iv*) market organization of agricultural

products; and (*v*) reconversion of old firms and retention of displaced manpower. In the remaining sectors of economy and even in the above fields where the private sector co-exists with the public sector, planning is *indicative.* It consists in the integration of individual planning efforts which, in isolation, are incapable of achieving their objectives.

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24. G. Myrdal, *Asian Drama*, 1968.

In the national plan, production and investment targets are laid down for both the public and private sectors. The basis of the national plans is the *Economic Table* which is made up of data pertaining to consumption, saving, investment, and foreign trade. This table shows the inputs and outputs of each sector of the economy. While framing the draft plan, the *Commissariat au Plan* (the French Planning Commission) discusses the plan with the representatives of the private sector in a number of commissions, known as *Modernization Commissions* to give the plan its final shape. There are two types of commissions, vertical and horizontal. The vertical commissions discuss and finalize the activities of the various sectors of the economy, such as agriculture, coal, steel, manufacturing, power, transportation, housing, education, public health, social welfare, etc. The horizontal commissions, on the other hand, deal with various balances in the economy between investment and saving, between income and expenditure of the state, between the inward and outward flows of foreign currency, and between financial and physical estimates. In this way, the private sector becomes a partner in the economic plan and helps in fulfilling the targets of the plan. The government provides incentives to the private sector through grants, loans, tax exemptions, etc. It gives *guidance* to the private sector instead of issuing directions. The private sector relies on the market conditions for production .and investment programmes. And if there is need for making adjustments in the plan due to changed market conditions, they can be made even during its execution stage. Thus there is sufficient individual freedem of choice and action in French planning. In fact, it presents a perfect compromise between freedom and planning, incorporates the merits of both the free market and planned economies and successfully avoids their demerits.

Criticisms. However, the success of indicative planning presupposes that "every branch of activity is promised the possibility of acquiring its

production factors and selling its goods on a balanced market. The promise, however, is only kept if everybody plays the game. The promise acts merely as an incentive. It is not binding on any body." But the actual experience of indicative planning in France shows that firms do not play the game when the development programme does not coincide with their profit expectations. Often monopolistic organisations do not care for the incomes policy laid down by the government and use their power for personal benefit. Moreover, under conditions of price inflation, the government interferes with the market mechanism by resorting to direct controls instead of monetary and fiscal policies. Thus the working of indicative planning in France casts doubts about its being a golden mean between free market and planned economies.

IMPERATIVE PLANNING

Under imperative planning all economic activities and resources of the economy operate under the direction of the state. There is complete control over the factors of production by the state. The entire resources of the country are used to the maximum in order to fulfil the targets of the plan. There is no consumers' sovereignty in such planning. The consumers get commodities in fixed quantities at fixed prices. Often the commodities are rationed. Production of commodities is in accordance with government policies. What and how much to produce such decisions are taken by the managers of firms and factories on the direction of the planning commission or a central planning authority. Since the government policies and decisions are rigid, they cannot be changed easily. If there is some bottleneck in fulfilling production targets at any stage, it adversely affects all related sectors of production. If managers of industries do not carry out production plans properly, production falls which undermines the entire production process in the economy. Imperative planning is in operation in China and Russia.

DEMOCRATIC PLANNING AND TOTALITARIAN PLANNING

TOTALITARIAN PLANNING

To many economists like Hayek and Lippman, planning is incompatible with democracy. Hayek goes to the extent of saying that "what was promised to us

as the Road to Freedom was in fact the High Road to Serfdom." But Hayek has in mind totalitarian planning which is comprehensive. In *totalitarian* or *authoritarian* planning there is central control and direction of all economic activities in accordance with a single plan. There is planning by direction where consumption, production, exchange, and distribution are all controlled by the state. In authoritarian planning, the planning authority is the supreme body. It decides about the targets, schemes, allocations, methods and procedures of implementation of the plan. There is absolutely no opposition to the plan. People have to accept and rigidly implement the plan. Economic and political powers are polarised and social life is regimented. There is thus no democratic freedom in authoritarian planning which is extremely rigid. But there are others who hold the view that "a planned society can be far more free society than the competitive *laissez-faire* order which it has come to replace." Whatever be the degree of deliberate control and direction of economic forces in totalitarian planning, it is for making the economic system perfect, and maintaining stability, and achieving rapid growth. Moreover, as pointed out by Professor Myrdal, "I find no example in history where democracy has been lost because of too much planning and state intervention, but plenty of examples on the contrary."[25] He, therefore, favours the Soviet type of planning for the underdeveloped countries of South-East Asia because it is scientific and efficient as compared to an unplanned economic system. Though authoritarian planning can help in achieving the targets within the stipulated period and according to schedule, yet the price which the people of underdeveloped countries shall have to pay in the form of the loss of economic, social and political freedoms is enormous. It is, therefore, better to have democratic planning and achieve the same results without, at the same time, sacrificing these freedoms totally.

DEMOCRATIC PLANNING

Democratic planning implies planning within democracy. In democratic planning, the philosophy of democratic government is accepted as the ideological basis. People are associated at every step in the formulation and implementation of the plan. A democratic plan is characterized by the widest possible consultations with the various state governments and private enterprises at the stage of preparation. It seeks to avoid all clashes, and tries to harmonise all opinions that are for the welfare of the people. Cooperation of

different agencies, and voluntary groups, and associations plays a major role in its execution. The plan is fully debated in the Parliament, and the state legislatures and in the private forums. The plan prepared by the Planning Commission is not accepted as such. It can be accepted, rejected or, modified by the Parliament of the country. Thus the plan is not forced upon the people from above. It is planning from below.

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25. G. Myrdal, *An International Economy,*1959.

Democratic planning respects the institution of private property. Nationalization is resorted to the limited extent absolutely necessary, and reasonable compensation is paid in all cases. Price mechanism is allowed to play its due role. The government only seeks to influence economic and investment decisions in the private sector through fiscal and monetary measures. The private sector operates side by side with the public sector. There is healthy competition between the two for the fulfilment of the plan targets. Democratic planning aims at the removal of inequalities of income and wealth through peaceful means by taxation and government spending on social welfare and social security schemes. Individual freedom prevails. People enjoy social, economic and political freedoms.

India is a unique experimentation in democratic planning. Planning in India is being carried out under a democratic government which is elected under universal suffrage. There is no undue encroachment on the rights and liberties of the people in the execution of the plans. There is freedom to own private property and in the event of expropriation adequate compensation is paid. Private sector co-exists with public sector. The latter operates under the guidance, help and supervision of the government. There is no force in the implementation of the five-year plans which are fully discussed and debated both within and outside the Parliament. People enjoy the fundamental rights of freedom of speech, association, occupation etc. The planning procedure in India is democratic.

Criticisms. Critics are not lacking in characterising democratic planning as a myth. They opine that democracy is not to be found anywhere, so there cannot be democratic planning either. Some sort of state intervention is inevitable even in democratic planning whereby economic freedom becomes a farce. The

institution of controls in various forms on consumption, production and distribution *viz.*, price controls and rationing, industrial licensing, monopoly regulation, import restrictions, state trading, etc., do not make for economic freedom. "India's planning is of an imperative type in democratic context... .It is a half way house between command and free economy, imbibing the disadvantages of both without the advantages of the either. It has its inbuilt difficulties which hinder progress. Socialist economy can follow its own path of growth, capitalist countries their own, planned economy in a democracy operates between the two, divided between public and private sector. In India the relationship between the two has been far from ideal."[26]

It is contended by Professor William Letwin that the Planning Commisssion in India does not possess an autonomous status in the real sense of the term. It is a part of the ruling party. The Chairman of the Planning Commission is the Prime Minister. The National Development Council, the most important body, is already without constitutional and statutory authority which derives its power from the simple fact that its members are the Prime Minister and opposition members, the chief ministers of all the states. "The resultant plan is politics. *Thus* Indian planning is democratic in constitutional form, in that the chief decisions are made by elected representatives of the people, it is not democratic in substance." We do not agree with Professor Letwin because in democratic planning the plan *must* reflect the aspirations of the masses as represented by the ruling party in the Parliament.

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26. K.N. Bhattacharyya, *Planning: Economic and Economy,* 1971.

Thus Indian planning is democratic both constitutionally and in substance, for some sort of controls and state intervention are essential for lifting the economy out of the morass and for the welfare of the masses. It is, however, felt that Indian planning in its democratic set-up should be *indicative* rather than imperative as has been the experience of France.

ROLLING AND FIXED PLANS

ROLLING PLAN

Professor Myrdal was the first economist to advocate a rolling plan for

developing countries in his book *Indian Economic Planning in its Broader Setting.* India did not experiment it for the first time in 1978. It was introduced for purposes of defence after the Chinese aggression in 1962 and has been a great success in making the country almost self-sufficient in the manufacture of sophisticated arms and ammunitions, frigates and aircraft, and helped to prepare it to face Pakistan twice. It was introduced in Indian planning by the Janata Government on April 1, 1978 and was given up on April 1, 1980 with the coming to power of the Indira Government.

In a rolling plan, every year three new plans are made and acted upon. *First,* there is a plan for the current year which includes the annual budget and the foreign exchange budget. *Second,* there is a plan for a number of years, say three, four or five. It is changed every year in keeping with the requirements of the economy. It contains targets and techniques to be followed during the plan period, along with price relationships and price policies. *Third,* a perspective plan for 10, 15 or 20 or even more years is presented every year in which the broader goals are stated and the outlines of future development are forecast. The annual one-year plan is fitted into the same year's new three-four- or five-year plan, and both are framed in the light of the perspective plan. For example, if planning is started in 1970 in a country, there would be three plans under the technique of rolling plan: an annual plan for 1970, a five-year plan for 1970-75, and a 20-year plan for 1970-90. The broad aims and objectives are laid down in the 20-year perspective plan. When the plan starts in 1970, there will be an annual plan in every subsequent year, that is, 1971, 1972 and so on. The five-year plan for 1970-75 will also roll on for the subsequent periods by shedding each previous year so as to become a plan for 1971-76, 1972-77 and so on. Since planning is a continuous process, every year the plan is revised in the light of new information, improved data and improved analysis. "At each revision it will be well to look into the future a number of years which is determined by the *nature of the factual circumstances....* If five years is deemed to be a suitable horizon, this number of years may be applied at each of the yearly revisions in the sense, one would always be working in the beginning of a five-year period."

Merits. The concept of rolling plan is devised to overcome the rigidities encountered in the fixed five-year plans. In the rolling plan, there are plan targets, projections and allocations that are not fixed for the five-year period

but are liable to revision every year in keeping with the changing conditions of the country. It not only provides greater flexibility but also a clearer perspective and a better view of the priorities.

Being flexible, a rolling plan is more realistic than a flexible plan. It takes into consideration such unforeseen natural and economic changes as floods, drought, war, hike in oil prices, etc., which may affect the economy adversely. Under a rolling plan, financial and physical targets can be revised in keeping with such changes. But such revisions are not possible under a fixed plan. Thus the rolling plan combines the advantages of both perspective and flexible planning.

Demerits. But critics are not lacking in pointing towards certain demerits of this technique of rolling plan. They point out that since the targets are likely to be revised every year, it is not possible to achieve the targets laid down in the plan within a fixed time period. Such frequent revisions also make it difficult to maintain proper balances in the economy which are essential for its balanced development. Again, when the plan is continuously revised, it creates uncertainties in the private and public sectors of the economy. Both sectors lose the urge to make changes in their production plans or to proceed in accordance with the previouly laid down targets. To achieve bigger targets becomes out of question. Moreover, constant revisions of the targets of the plan develop an attitude of non-commitment and apathy among the planners and the public which do not augur well for the future development of such a country.

Further, the success of the rolling plan depends on a strong communication system from the village to the headquarters of the planning body. This requires a large manpower base trained in the collection of data at the village, block, district and state levels. The data are required to be processed. This necessitates the installation and operation of the latest computerised system which is very costly and is difficult to operate in an underdeveloped country. Leaving aside this aspect, the success of a rolling plan depends upon the extent to which data are collected, communicated and computerised regularly. It also depends on the ability of the planning machinery to cope with the work of continuous revisions of the five-year plan every year in the light of the changing natural or economic conditions. But it is not within the competence of the planning machinery in an underdeveloped country to collect, communicate and

computerise data accurately and regularly throughout the year from different sectors of the economy.

Again, for the rolling plan to be successful, "up-to-date knowledge of progress as well as the shortcomings in the implementation of projects are absolutely essential. Unfortunately, such information is today so widely scattered that for all practical purposes it does not exist. And, at any rate, it is far from up-to-date and quite insufficient to roll the plan. To organise such information and the capacity to use it is, therefore, the prime need. As this obviously cannot be done overnight it would be advisable, to start with, for the rolling exercise to be confined to selected sectors in which the required information can be effectively organised."

These were the difficulties which led to the abandonment of this technique of rolling plan in such underdeveloped countries as Burma and Mexico. But it has been a success in such developed countries as Japan and Poland.

FIXED PLAN

In contrast to the rolling plan, there is a fixed plan for four, five, six or seven years. A fixed plan lays down definite aims and objectives which are required to be achieved during the plan period. For this purpose, physical targets are fixed along with the total outlay. Physical targets and financial outlays are seldom changed except under emergencies. Planning in Russia and India is of the fixed type. Economic plans in Russia are of seven years, while they are of five years in India.

Merits. Such planning has certain merits which make it superior to rolling planning.

1. One of the merits of this type of planning is that it fixes targets and priorities rigidly for achieving the objectives laid down in the plan. Targets are bold and cover every aspect of the economy. They are meant to be fulfilled both by the public sector and the private sector during the fixed period of the plan. It is thus a challenge to both the sectors which make all-out efforts to achieve them through mutual cooperation and healthy competition.

2. It helps in maintaining proper balances in the economy. As the plan is for

a fixed period, every effort is made to avoid scarcities of physical and financial resources. For this, priorities are laid down on the basis of the short-term and long-term needs of the economy in keeping with the available material, human and financial resources. On the basis of the various priorities of the plan, monetary, fiscal and direct policy measures are adopted to maintain proper balances in the economy. Such balances can be maintained under a fixed plan rather than in a rolling plan.

3. There is no element of uncertainty in this type of planning. The planning machinery, the public sector and the private sector are definite about the objectives and targets of the plan which are to be achieved during a given plan period. They, therefore, do their best to achieve them within that period.

4. When there is a fixed plan with given objectives and targets, it ensures public cooperation and political will to make the plan a success. This is because people know and realise that the success of the plan will bring manifold benefits to them by the end of the plan in the form of rising incomes, larger employment opportunities, improved agricultural facilities, more power for agriculture and industry, etc.

5. Such a plan helps in reviewing changes in national income, investment, saving, consumption; and the performance of the different sectors of the economy in the previous plan. Consequently, the fields of success and failure are pointed out and efforts are made to have a better performance and to overcome failures in the current plan. Plan evaluations are also made during the plan period. All this provides an opportunity to the planners to bring stability in the economy while the plan is still in progress.

Demerits. Despite these merits, fixed plans, as they are in vogue in India, have certain demerits.

1. The fixed plans in India have no connection either with available physical or financial resources. The main aim has been to fulfil the financial targets by all means through deficit financing, heavy taxation, larger borrowings and through massive foreign aid, irrespective of their adverse effects on the economy. The actual achievements have always fallen short of physical targets. Spending huge sums without matching results in physical terms has led to distortions in the price structure and availability of essential commodities. This

has often led to Plan holidays, as between 1966-68. Often a FYP (five year plan) is started on schedule but the actual plan is brought out after the lapse of $2^{1/2}$ years, as was the case with the Fifth FYP. A mid-term appraisal is done after three years which is nothing but a post-mortem exercise, an exercise in futility. By the time this report is published, the next plan is due which is again delayed because the necessary figures relating to the various variables and sectors of the economy are not available in time.

2. The present system of fixed plans fails to take into account unforeseen changes which may occur in the economy during the period of FYP. They may be natural forces, such as floods, cyclone or famine or economic such as hike in oil prices or external such as war. There may also be difficulties of achieving the targets or of obtaining resources as laid down in the plan. A rolling plan offers flexibility to such factors changing from time to time. Some discrepancies are also likely to creep in between forecasts and actuality in the process of planning even in an ordinary way. Thus there is always the need for a built-in capacity in the planning system to correct such mistakes.

3. Besides, a fixed FYP is unsuited for large projects which are not merely lumpy but have a long gestation period of ten to fifteen years, such as river valley projects. Such projects spill over the FYP period and have to wait for fresh sanction at the beginning of the next FYP. This results in the slowing of the pace of progress of the project. Therefore, such projects cannot be tied down to a rigid framework of a FYP and need to be adjusted in a rolling plan.

4. Similarly, the problems of poverty and unemployment cannot be solved in a period of five years. Right from the second FYP, our plans aimed at the eradication of these two scourges of modern civilisation but achieved little towards this direction. They are long-term problems which can be solved within the framework of a rolling plan in a perspective period of 10, 15 or 20 years.

5. Last but not the least, the industrial development in India during the last 60 years of planning has been extremely uneven and unbalanced. In fact, industrial development has been urban development as in advanced countries which goes against our socio-economic set-up. There has been concentration of industries in and around urban centres. There is thus the need for a policy of balanced

regional development which necessitates decentralisation of industries near rural and. backward areas. This is essentially a long-term problem which requires a rolling plan for its solution.

Conclusion. These demerits of fixed planning are not so serious as to discard it in favour of rolling planning. Physical and finacial shortages are bound to arise in every type of planning. They are not peculiar to a fixed plan and they can be better faced and overcome during a fixed plan period. As regards the long-term problems of poverty, unemployment, inequalities and regional imbalances are concerned, they can be gradually solved within the framework of a number of fixed plans. Projects with long gestation period can also be completed under two or three plans. In fact, all long-term problems and projects form part of a perspective plan which is contained in every five-year plan document. The present five year plan is a projection and continuation of the previous plans and it leads to subsequent plans. Thus all long-term problems of an economy can be solved by a series of fixed plans.

PLANNING UNDER CAPITALISM AND SOCIALISM

PLANNING UNDER CAPITALISM

Planning under capitalism is not based on any central plan. In the absence of a central plan, the means of production are owned privately. Production is also carried out by private enterprise. It is not planned by the government. Market prices are determined by market forces and are not set by the government. So under capitalist planning, the institutions of private ownership, private enterprise and price mechanism continue to operate. Given these institutions, there is no comprehensive planning under capitalism. The state plans on a limited scale "to harness self-interest to the service of the community as a whole, and to supplement the price system, as well as ensuring that it works efficiently.[27]"

To achieve these tasks, the government of a capitalist economy performs three functions: (1) It adopts appropriate measures to maintain aggregate demand which is neither too smalll nor too large so that recession or inflation is avoided. For this, the government regulates the actions of private enterprise. It establishes healthy monetary and credit institutions, and adopts fiscal measures

in keeping with the economic situation of the country. (2) It prevents monopoly concentration. Monopoly distorts the price mechanism under capitalism. It restricts output to keep up prices so that less resources are employed. To check monopoly and monopolistic practices, the government adopts anti-monopolistic measures and even nationalises some of the monopolistic corporations for the benefit of the community at large. (3) The government adopts measures for the satisfaction of communal wants in the form of public health measures, public parks, roads, bridges, museums, zoos, education, flood control measures, etc. All these activities of the government are not coordinated by any central plan.

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27. F.W. Paish, *Benham's Economic*, 8/e, p. 56.

Thus planning under capitalism is confined to the regulatory activities of the government so as to avoid recession or inflation, to prevent monopoly concentration, to raise the standard of living of the people and to create conditions for the smooth functioning of the price mechanism with a sufficient degree of competition.

PLANNING UNDER SOCIALISM

Planning under socialism is based on a central plan. There is a central planning authority or board which formulates a plan for the entire economy. There is complete centralisation of economic power in the central planning authority. It fixes the plan objectives, priorities and targets. It organises and allocates the resources of the economy by deliberate direction and control for the purpose of achieving definite objectives and targets laid down in the plan during a specified period of time. The central problems of an economy, what and how much is to be produced; how, when and where it is to be produced; and to whom it is to be allocated, are exclusively decided by it.

The central plan has definite socio-economic objectives. These objectives may concern aggregate demand, full employment, satisfaction of communal demand, allocation of factors of production, distribution of national income, amount of capital accumulation, economic development, and so forth.

To achieve these objectives, the planning authority owns and controls the

means of production and distribution. All mines, farms, factories, financial institutions, distributing agencies such as shops, stores, internal and external trade, means of transport and communications, etc. are owned, controlled and regulated by government departments and state corporations under the overall supervision and control of the planning authority. Production in the different sectors of the economy is governed by priorities and targets of the plan. Production of consumer goods is generally governed by the preferences of consumers and the available commodities are distributed to them at fixed prices. Under socialist planning, consumers' sovereignty is confined only to the choice of socially useful commodities which the planning authority deems fit to produce and provide to the people.

The pricing process under socialist planning does not operate freely but works under the control and regulation of the central planning authority. According to Dickinson, socialist planning and the pricing process are not opposed to each other. Rather, they are complementary principles of economic regulation. The former supports the latter in four ways: *First*, to give general direction to the socialist economy. *Second*, to make decisions where market indications are lacking. *Third*, to eliminate cyclical fluctuations in economic activity. *Fourth*, to deal with special emergencies. Thus the pricing process plays an important role under socialist planning even though prices are fixed by the planning authority. There are market prices at which consumer goods are sold. There are also accounting prices on the basis of which managers decide about the production of consumer goods and investment goods, and also about the choice of production methods. The pricing process does not regulate the plan. It is subservient to the central plan.

Conclusion. Socialist planning is superior to capitalist planning. The adoption of planning under capitalism fails to bring economic efficiency, to avoid wastage of resources, to check monopolistic practices fully to reduce inequalities of income and wealth, and to avoid booms and slumps. This is borne out by the experience of all capitalist countries. On the other hand, socialist planning provides greater economic efficiency because the means of production are not left to the market forces. Rather, they are controlled and regulated by the planning authority in the most efficient manner. Moreover, there is greater welfare due to less inequality under socialist planning. The central plan aims at providing socially useful goods and services. As the

planning authority owns, controls and regulates all the means of production and distribution. Every citizen is paid his remuneration according to his ability, education and training, thereby reducing inequalities. Finally, under socialist planning, the planning authority is able to avoid deflationary and inflationary trends by a better coordination of the actions of various producing units and making full use of available resources.

CENTRALISED AND DECENTRALISED PLANNING

Planning may be centralised or decentralised. This division is made from the viewpoint of the execution of plans. Under centralised planning, the entire planning process in a country is under a central planning authority. This authority formulates a central plan, fixes objectives, targets and priorities for every sector of the economy. It takes all investment decisions in accordance with the goals and targets of the plan. The principal problems of the economy, what and how much is to be produced; how, when and where it is to be produced; and to whom it is to be allocated, are exclusively decided by this authority. The central planning authority controls every aspect of the economy. It fixes prices of all products and wages of all types of workers. All anticipated financial product and factor imbalances that are likely to arise within the planning period, are sought to be corrected in advance by the planning authority.

Oscar Lange rejects centralised planning because of its undemocratic character. The entire planning process is based on bureaucratic control and regulation. Naturally, such planning is rigid. There is no economic freedom and all economic activities are directed from above. Shortages and mistakes arising during the course of planning are not likely to be rectified because of the absence of decentralised decision-making.

On the other hand, decentralised planning refers to the execution of the plan from the grass roots. Under it, a plan is formulated by the central planning authority in consultation with the different administrative units of the country. The central plan incorporates plans under the central schemes, and plans for the states under a federal set-up. The state plans incorporate district and village level plans. Similarly, plans for different industries are formulated in consultation with representartives of industries. But individual firms are free to

take independent decisions about investment and output policies, and so are individual farmers. Under decentralised planning, prices of goods and services are primarily determined by the market mechanism despite government control and regulation in certain fields of economic activity. There is freedom of consumption, production and enterprise under it. However, the planning authority recommends to the central and state governments to provide certain incentives to the private sector. It also lays down areas of public sector activities.

Decentralised planning is superior to centralised planning in that it provides economic freedom and flexibility to the economy. But its dependence on the market mechanism leads to shortages or surpluses in the production of goods and services. They are likely to create problems for the government because adjustments are difficult to make. For instance, shortages of goods lead to inflation and the adoption of price controls and rationing creates more problems. Further, it is not possible to coordinate the decisions of the planned and unplanned sectors. This is one of the main reasons for distortions in the economy which lead to disequilibrium in the demand for and supply of goods and services. Of the two, centralised planning provides cohesiveness to the economy whereas decentralised planning provides economic freedom and incentives to the market economy.

CORRECTIVE PLANNING AND DEVELOPMENT PLANNING

A number of maladjustments arise in a capitalist economy. When the government plans and adopts various fiscal, monetary and direct control measures to rectify them, this is called corrective planning. If the economy suffers from inflationary pressures, the government adopts such corrective measures as a contractionary monetary policy, raising tax rates, reducing consumption, investment and public expenditure. It may also adopt a surplus budgetary policy. In the event of a depression, corrective planning includes an expansionary monetary policy, reduction in tax rates, stimulation of consumption, increase in private and public investment, and a deficit budgetary policy. Excessive inequalities of income distribution and concentration of monopoly power are also sought to be reduced under corrective planning. To reduce inequalities of income distribution, corrective planning requires the

adoption of such measures as imposition of heavier burdens on the higher income groups through death duties, steeply progressive income taxes, increased expenditure on public works and social security, etc. To control monopoly concentration, the government may encourage competitive small business, start public enterprises, pass anti-monopoly laws and even nationalise monopolistic industries. Planning in the United States and in other capitalist countries is of the corrective type.

Development planning is meant to develop the economy as a whole. It involves "the application of a rational system of choices among feasible courses of investment and other development actions."[28] For this, it relies to a large extent on the market mechanism. Under development planning, the government formulates a development plan for the whole economy. It includes consideration of the most important economic aggregates such as total saving, investment, output, government expenditure and foreign transactions. It also explores sectoral relationships in the overall framework of the economy. In particular, it lays down investment priorities for the public sector. Public investments cover the whole infrastructure of the economy including investments in health, education and training. The private sector is considered a partner in the development efforts of the economy. The government does not use force on the private sector to get the plan implemented. Rather, it provides incentives through monetary, fiscal and direct control measures. At the same time, the government adopts measures to restrict unproductive activities so that private investment is channelised into productive activities.

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28. A. Waterstone, "Lessons of Experience," in *Leading Issues in Economic Development,* Gerald M. Meier, (ed.), 2/e, 1970.

Development planning is primarily related to the. development activities of underdeveloped countries. Since such countries have a number of economic, social and political obstacles to development, it is not possible to make development planning a success even by the best policies. Lewis observes in this connection: "Good policies help, but do not ensure success. Development planning is in this respect like medicine; the good practitioner knows some useful tricks; but it is still the case that many patients die who are expected to live, and many live who are expected to die."[29]

PLANNING IN A MIXED ECONOMY

Mixed economy is a compromise between the two economic systems, capitalism and socialism. It is a system which is free from the evils of both capitalism and socialism but integrates the good features of both. That is why it is known as mixed economy which is a golden means between capitalism and socialism. It is through planning that the merits of a socialist economy are imparted and the defects of capitalism are sought to be removed in a mixed economy.

Planning in a mixed economy is not comprehensive in the sense of socialist plaiming. It divides the economy into public and private sector for the purpose of economic development. The public sector is under the direct control of the government which regulates its production and distribution. All services in which the profit expectations are low and investments are large with long gestation period are operated under the public sector, such as rail, road and air transport, power generation plants, posts and telegraphs, etc. There are in fact public utilities which are operated by the state for public welfare. Besides, defence, atomic energy, heavy, basic and strategic industries are all operated in the public sector. The plan allocates investment, lays down targets and fixes priorities for this sector.

There is the private sector in which individuals manage what they own, usually in farming, industry and retailing. Keeping the public interest in view, the state regulates the working of this sector by giving suggestions, subsidies, credit facilities, raw materials, cheap power, concessional transport facilities, tax holidays, concessions, etc., and by administrative controls and directions. If certain industries do not work satisfactorily or operate against public interest, the state nationalises them by paying appropriate compensation.

A sector based on the principles of cooperation also exists in a mixed economy. It is usually to be found in farming, dairying, consumer purchases, and in small manufacturing. The cooperative sector is organised by the people with the assistance of state cooperative agencies to reduce exploitative market tendencies and to inculcate spirits of cooperation and self-help.

Merits. Planning in a mixed economy has the following merits:

1. Planning in a mixed economy is meant to provide all the freedoms of capitalism, such as freedom of consumption, freedom of production, freedom of occupation, freedom to hold property, etc. But these freedoms cannot be enjoyed absolutely and at the cost of public welfare. So the government puts checks on these freedoms by proper regulation and control of such economic activities as the production and distribution of essential commodities in order to prevent their hoarding and black-marketing, and even rationing them in the event of acute shortages, of private property for an equitable distribution, of monopoly concentration of economic power, etc.

2. The ultimate aim of planning in a mixed economy is to remove the evils of capitalism and to promote the maximum welfare of the people. These objectives are achieved through the various measures outlined above. Besides, to protect workers from capitalist exploitation, the state passes labour laws and fixes minimum wages, working hours, etc. and provides social security in the form of life insurance, unemployment insurance pension, provident fund, maternity benefits, free education, recreational facilities, etc. The state also aims at reducing inequalities of income distribution through these measures.

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29. W.A. Lewis, *Development Planning*, p. 23.

3. Planning in underdeveloped countries is primarily based on the concept of mixed economy. The main aim of such planning is to increase the growth rate of the economy, given the various limiting factors in such countries. For this, planning in a mixed economy envisages a high rate of capital formation through various monetary, fiscal and physical control measures; through foreign aid, comprehencive exchange control and protective tariffs; and through public and private investments so that the economy develops in a balanced way. Thus planning in a mixed economy "affords the advantages of resolute government action in overcoming existing barriers to economic growth, does not involve an amount of central integration exceeding the capacity of its bureaucracy, and fosters a maximum of cooperation between private business and government."

Demerits. Despite these merits, planning in a mixed economy is faced with certain problems which make it difficult to achieve the objectives and targets of the plan.

First, there is non-cooperation between the two sectors. The experience of the working of mixed economies reveals that the government treats the private sector like a step-child and imposes many restrictions on it. The private sector is taxed heavily. It has to operate under numerous controls and "bureaucratic capitalism". On the other hand, the public sector is given preference over the private sector in all matters. Thus bitterness and non-cooperation develop between the two sectors which lead to the non-fulfilment of the plan targets. Since the private sector operates on the basis of the market mechanism, shortages lead to rise in prices which spread to the public sector. This is because both the sectors are dependent on each other for supplies of raw materials, intermediate products, etc.

Second, planning in a mixed economy involves the expansion of the public sector whereby public outlay is increased. But enough financial resources are not available in an underdeveloped country to meet large plan outlays. This leads to deficit spending, thereby leading to inflationary pressures within the economy.

Third, the public sector is a big burden on the financial plan. Bureaucratic control leads to inefficiency. There is over staffing of the personnel, red tapism, corruption and nepotism. As a result, production falls and losses emerge. Moreover, the majority of public undertakings being of long-gestation period and involving huge investments, they continue to operate under losses for a number of years. Thus shortages of goods continue which accentuate inflationary pressures.

PLANNING MODELS

Planning models have been increasingly used in underdeveloped countries for the drawing up of plans for economic development. A model expresses relationships among economic variables which explain and predict past and future events under a set of simplifying assumptions. In other words, a model consists of a series of equations, each of which represents the association among certain variables. In this sense, a planning model is a series of mathematical equations which help in the drawing up of a plan for economic development. Broadly, a model may have endogenous and exogenous variables. Endogenous variables are those whose values are determined from

within the system such as national income, consumption, saving, investment, etc. On the other hand, exogenous variables are determined from outside the system such as prices, exports, imports, technological changes, etc. A planning model specifies relationships between endogenous and exogenous variables and aims at ensuring the consistency of the proposed plan for economic development. "It is meant to yield an optimally balanced collection of measures, *known as* Model Targets, which can help the planning authority in the drawing of an actual plan." A UN study defines a planning model as that based on precise knowledge of medium and long-term economic aims, which is mathematically expressed in the form of a preference function and reflects the initial conditions of the economy including economic policy measures already proposed and show the most probable path of economic development.[30]

Planning models are of three types: aggregate, multisector and decentralisation. *Aggregative models* trace the optimal paths of development overtime of such economy-wide aggregates as income, saving, consumption, investment, etc. The Harrod-Domar Models and the Two-Gap Models are of this type. But it is not possible to build highly aggregative models in UDCs because of the lack of accurate data and computational devices.

Multisector models are designed which connect macroeconomic aggregates with the sectors constituting the operational content of the plan. The Mahalanobis Two-Sector and Four-Sector Models are of this type. Multisector models are also set in terms of input-output models. They are consistency models based on the Leontief inter-industry system. The Consistency Model for India's Fourth Plan by Manne, Rudra and others, and the model of Indian Fifth Plan were framed in terms of the input-output models. Further, optimising or linear programming models are also multisector planning models. They extend the consistency models of the input-output type to optimization of income or employment or any other quantifiable plan objective under the constraints of limited resources and technological conditions of production. Such models can be static or dynamic. Static LP models solve the systems of equations for optimal solutions in relation to a single year, while dynamic LP models explain the optimal growth path over the entire plan period.

Decentralised models have sector or project level variables which are used to

prepare models for individual sectors or projects. Such models are useful in the early stages of a country's economic development when information is available for only individual sectors or projects.

The usefulness of planning models in actual plan-making are: "(*a*) to provide a frame for the checking of the consistency or the optimality of the official plan targets; (*b*) to provide a frame for the actual setting of targets; (*c*) to provide a frame for the evaluation and selection of projects; and (*d*) to provide an insight into the structure of the economy and its dynamics to help better policy decisions."[31]

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30. UN, ECE, *Development in the Construction and Use of Macroeconomic Models* 1968.

31. Ashok Rudra, *Indian Plan Models*, p. 201.

CHAPTER

Shadow Prices

INTRODUCTION

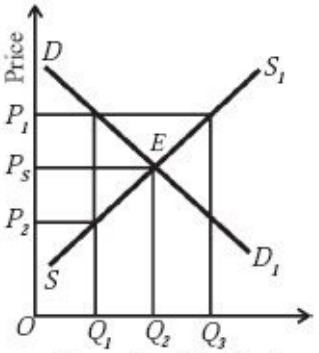
In underdeveloped countries, for project evaluation and programming, the distribution of factors on the basis of market prices is imperfect because there exist fundamental disequilibria which is reflected in mass underemployment at existing wage levels, in the deficiency of funds at existing interest rates and in the scarcity of foreign exchange at the prevalent exchange rate. In such a situation, the equilibrium level of wages would be much below the market wage, the equilibrium interest rates would be higher than their market rates, and the equilibrium rate of exchange would be lower than its market rate. In order to overcome these difficulties J. Tinbergen, H.B. Chenery and K.S. Kretchemer have emphasized the use of shadow or accounting prices.

NEED FOR THE USE OF SHADOW PRICES

The price mechanism operates imperfectly in underdeveloped countries. Market prices do not correctly reflect relative scarcities, benefits, and costs. This is because perfect competition is entirely absent; structural changes do not respond to price changes; institutional factors distort the existence of equilibrium in the product, labour, capital and foreign exchange markets; and prices fail to reflect and transmit the direct and indirect influences on the supply side and the demand side. Markets are not in equilibrium due to structural rigidities. Labour cannot be usefully employed because of the shortage of other cooperant factors. The rate of interest understates the value of capital to the economy. And disequilibrium persists in the balance of payments which cannot be reflected in the official rate of exchange. For instance, in such economies wages are much lower in the non-organized agricultural sector while they are even higher than the opportunity cost of labour in the industrial sector where labour is organised in strong trade unions. In capital market; the market rate of interest is much higher than the

bank rate, and the current rate of foreign exchange is much lower than in the black market. Thus "market prices, particularly those of the factor of Production form a very imperfect guide to resource allocation in underdeveloped economies, because there exist fundamental disequilibria which are reflected in the existence of massive underemployment at present levels of wages, the deficiency of funds at prevailing interest rates and the shortage of foreign exchange at current rate of foreign exchange."[1] To overcome these problems, the use of shadow prices has been suggested by economists for the allocation of resources in development planning, for evaluating projects and as a device in programming. To conclude with Streeten, "The call for the use of shadow prices (or accounting prices) in planning for development stems from the obvious fact that actual market prices do not reflect social benefits and social costs. Some are fixed by administrative *fiat*. Others are 'free', but influenced by restrictive practices or monopolies. Others again are influenced by quantitative controls. The shadow price is the price which would prevail if prices were equilibrium prices...."

The fixation of shadow price for irrigation water is illustrated in Fig. 1. The supply and demand for irrigation water is taken on the horizontal axis and price in the accounting period is taken on the vertical axis. In the initial accounting period, OQ_1 quantity of water is needed by the farmers of the area. But the government is supplying only OQ_2 quantity of water from the irrigation project at OP_1 price. In the next accounting period, the government may set the price equal to marginal cost or charge the price of irrigation water too low as part of its strategy of regional development. After the low price OP_2 is charged by the government, the demand for irrigation water will exceed its supply. In such a case the government may adopt the policy of rationing of water. It may ask each farmer to limit their land-area for irrigating. In the next accounting period, the government uses OP_S as the shadow price which is the equilibrium price when OQ_S of irrigation water is supplied and demanded.



Demand and Supply of Irrigation Water

Fig. 1

MEANING OF SHADOW PRICES

Shadow prices reflect intrinsic or true value for factors or products. J. Tinbergen defined them for the first time in 1954 in these words: "*Shadow Prices are prices indicating the intrinsic or true value of a factor or product in the sense of equilibrium prices. These prices may be different for different time periods as well as geographically separate areas and various occupations (in the case of labour). They may deviate from market prices*."[2] In 1958, Tinbergen defined shadow prices as those that correspond to intrinsic values and "that would prevail if: (i) the investment pattern under discussion were actually carried out; and (ii) equilibrium existed on the ,markets just mentioned (i.e., labour, capital, foreign exchange markets)"[3] This definition is clear and exhaustive, but is silent about the behaviour of accounting prices over time.

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1. UN, ECAFE. "Criteria for Allocating Investment Resources among Various Fields of Development in Underdeveloped Countries," *Economic Bulletin for Asia and Far East*, June, 1961.

2. *Investment Criteria and Economic Growth*, (ed.) M. Millikan, 1955.

A UN report defines shadow prices in terms of the opportunity cost of the factor or product. The shadow price of an output such as capital labour or foreign exchange represents its "opportunity cost" or the loss to the economy that would result from a reduction in its supply by one unit. A factor that is expected to be in short supply should have an accounting price higher than its market price, while one that is surplus should have a valuation that is lower than its market price.[4] A. Qayyum, however, defines shadow prices in terms of the marginal productivity of factors. In his words, 'accounting prices are the values of the marginal productivity of factors when a selection of techniques has been made which produces the maximum possible volume of output, given the availability of resources, the pattern of final demand and the technological possibilities of production.'[5] It would require the calculation of the marginal productivity of factors by the government manipulating the system of subsidy and taxation in such a way that the supply prices of factors to the producers equal the value of their marginal productivity. E.J. Mishan gives the simplest definition in these words, "A shadow or accounting price.....is the price the economist attributes to a good or factor on the argument that it is more appropriate for the purposes of economic calculation than its existing price if any."[6] Thus there is hardly any unanimity over defining accounting prices and the different concepts present so many difficulties in their calculation that the

concept becomes ambiguous.

DETERMINATION OF SHADOW PRICES

The determination of shadow prices can be done through the general equilibrium method or the partial equilibrium analysis:

1. General Equilibrium Method. In the general equilibrium method, equilibrium is established among all factors by taking their final demand and supply. For this, the data relating to the different sectors of the economy is collected and the accounting price of every factor is expressed in algebraic symbols, and added up for the whole economy. A number of simultaneous equations are required to be solved for which correct and adequate data are not available. Since the shadow price is the price which would prevail if prices were equilibrium prices, the existence of full equilibrium is essential for the establishment of an equilibrium price for every factor of production. The evaluation of shadow prices can be done in two ways: one by trial and error, and two, by a systematic method. If the method of trial and error is adopted the evaluation of accounting prices may be based on arbitrary values for products, factors and foreign exchange, calculating the priority figures for all investment projects and finding out whether equilibrium has been attained in the markets or not. If this method fails, a systematic method is required which consists "in introducing algebraic symbols for each of accounting prices, trying to express supplementary demand for the factors and supply of the products concerned, and then equating total demand to total supply." But the existence of full equilibrium situation for the entire economy is not realistic because in order to find out the equilibrium prices, the knowledge of total demand and supply curves and the production and consumption functions underlying them is essential. These functions depend upon the varied social institutions. So the determination of accounting or shadow prices through the general equilibrium method is a difficult affair.

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3. *The Design for Development*., p., 39

4. *Formulating Industrial Development Programmes*, 1961

5. *Theory and Policy of Accounting Prices*, 1959.

6. *Cost-Benefits Analysis*, 1971.

2. Partial Equilibrium Method. According to the partial equilibrium method, the shadow prices of capital, labour and foreign exchange are determined separately. This is, therefore, a simple and correct method of determining shadow prices. We discuss below the determination of the shadow or accounting prices of capital, labour and foreign exchange.

(a) *Determination of the Accounting Price of Capital*. To determine the shadow price of capital or the accounting rate of interest, it is essential to study the factors which influence the demand and supply of capital. But in underdeveloped countries, the knowledge of these factors is imperfect. Moreover, there is little relationship between the supply of capital and the interest rates prevalent in such economies. There is wide disparity between the prevailing interest rates in different regions and areas. As such, the accounting or shadow rate of interest can be estimated on the basis of the interest rates paid by private investors. But while so doing, it is essential to make allowance or allow discount on different types of loans for differences in risks involved. In the UN Manual of Economic Development Projects, the following formula has been used for calculating the shadow price of capital.

Social return to capital used in the sector

Value of output *minus* cost of materials,

$$= \frac{\text{depreciation and labour}}{\text{Investment}}$$

In this, the costs of materials, labour, foreign exchange and other inputs are valued at accounting prices, and to calculate the return on capital invested (rate of interest) these costs are deducted from the value of output. Thus the accounting price of capital can be known for a sector. Tinbergen opines that it is better to take a higher price of capital than interest rates at which limited sums can be borrowed under certain conditions in underdeveloped countries. He, therefore, suggests an interest rate of 10 per cent for underdeveloped countries on the plea that even some of the developed countries were having an interest rate of 7 to 8 per cent till recently, whereas personal loans are being made now at an interest rate of 25 to 30 per cent in the former.

Its Difficulties. But there are certain difficulties in the calculation of the

shadow rate of interest in underdeveloped countries.

First, to base the shadow rate of interest on what is paid by private investors understates the value of capital to the economy because an integrated development programme may raise the interest rate over the long run.

Second, the calculation of the marginal product of capital as the basis of the shadow rate of interest for the whole economy is not easy when projects of higher and lower capital intensity are started, and there is considerable waste of capital in substituting capital for labour in moving things about, in the handling of materials inside the factory, in packaging, in moving earth, in mining, in building and construction, and their failure to develop an appropriate technology in keeping with their factor endowments.[7]

Third, in the shadow rate of interest 'double index number ambiguity' is present which makes its use somewhat dubious. The rate of interest is both a stock and flow concept. The shadow rate of interest is thus not a single measure but is concerned with relations between stock and flow. In fact, in a developing economy there is a very large variety of stocks with different degrees of durability. Thus the calculation of the shadow rate of interest becomes very complicated.

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7. W.A Lewis, *Development Planning*, 1966.

$$R = \frac{G}{S_p + \frac{1-P_y}{P_y} S_w}$$

However, the appropriate formula for the calculation of the shadow rate of interest for the economy is: where, R is the shadow rate of interest, G is the rate of growth, S_p is the savings rate of profit receivers, P_y is the share of profit in total income, and S_w is the savings rate of the wage earners.

Assuming G = 5 per cent, S_p = 25 per cent, P_y = 50 per cent, and S_w = 5 per cent, the shadow rate of interest will be:

$$R = \frac{5}{0.25 + \frac{1-0.5}{0.5} \times 0.05} = \frac{5}{0.3} = 16.6 \text{ per cent}$$

(*b*) *Determination of the Price of Labour.* Determination of the shadow price of labour is a difficult problem because labourer differ in efficiency. Therefore, shadow price of labour cannot be the same for both the unskilled and skilled labour and for different types of skilled labour. There has to be a different shadow price for different types of labour because labour is not like other factors. In underdeveloped countries there is surplus labour in the rural areas having almost zero marginal product. But its shadow price cannot be assumed to be zero, it should be positive and provide a minimum subsistence level when such labour is employed on construction works. "But even if the marginal product of labour is less than the wage (or subsidized income), it does not necessarily follow that one should use a shadow price for labour lower than the wage. This is because wage earners tend to consume most or all the wages which they are paid. Thus the payment of wages constitutes a real cost to the economy, even if there is no alternative employment for labour." Therefore, some economists are of the view that the accounting price for labour can be fixed anywhere above the zero marginal product of labour, and with the increase in the marginal product of labour its accounting price can also be raised. But, according to UN experts, assuming no surplus of skilled labour but ample supplies of agricultural and unskilled labour the accounting prices of different kinds of skilled labour can be based on the cost of moving workers from villages to industrial areas, providing them with houses and other facilities, and training them.[8]

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8. UN. ECAFE.

(*c*) *Determination of the Rate of Foreign Exchange*. The shadow price of foreign exchange is essential for underdeveloped countries suffering from balance of payments difficulties. An artificial equilibrium is achieved in the balance of payments by fixing a higher shadow rate of exchange than the official rate of excnange. "In an optimum development plan, the accounting price of foreign exchange would be equal both to the incremental cost of earning foreign exchange through exports and to the incremental cost of saving foreign exchange through import substitution. The former may be

easier to estimate in many cases because there are relatively few potential exports, at least in the near future in underdeveloped countries." For this, weight is attached to the cost of foreign exchange in the project. If say, "the accounting price of foreign exchange is 50 per cent higher than its market value, the net effect of a project on the balance of payments should be given a weight of .5 in addition to the effect on the national income. This is equivalent to valuing all foreign exchange costs and earnings at a price of 1.5."[9] According to Dr. Little, Israel is the only developing country in which the accounting price of foreign exchange is estimated in this way.[10] It is not essential that every project should be weighted equally because the foreign exchange component of each project is different.

As an alternative, it is suggested that the demand for and the supply of foreign exchange should be computed which should then determine the rate where the two equilibrate. But this procedure is not practicable in developing economies where the foreign exchange requirements differ sector-wise and project-wise. Further, a single shadow rate of exchange cannot be applied over time. It will have to be reviewed and raised at different points of time on the basis of the 'black' and 'free' rates of exchange, because the market for some important international currencies like the dollar and the sterling is imperfect. Professor Tinbergen suggests the calculation of the shadow rate of foreign exchange based on the 'black' and 'free' rates of exchange. If the official (free) exchange rate is Rs. 7.5 a dollar and the black rate is Rs. 15 a dollar and the conversion of the official rate is four times as great as that at the black rate, then the shadow rate would be the weighted average

$$\frac{4 \times 7.5 + 1 \times 15}{5} = 9$$

Rs. 9 per dollar would then be the most serviceable shadow rate instead of the official rate of Rs. 7.5.

DIFFICULTIES OF SHADOW PRICE

Apart from certain difficulties already mentioned in the determination of shadow price for capital, labour and foreign exchange, there are other difficulties of a general nature.

First, the calculation of shadow prices pre-supposes the availability of data. But adequate data is not easily available in less developed countries.

Second, in order to establish the intrinsic value of a factor or product requires the existence of full equilibrium in all market. In an underdeveloped economy which is characterized by a number of fundamental disequilibria, the knowledge of full equilibrium conditions for the entire economy is not possible. Thus the notion of shadow prices corresponding to intrinsic values is arbitrary.

Third, the assumption of full employment equilibrium in the whole economy makes the concept of shadow prices indeterminate. It requires a complete knowledge of demand and supply functions which are based on the existing social institutions in the economy. "Land prices will depend upon the system of land tenure and on agricultural policy generally. The supply price of labour will depend upon the motivation and education of potential workers, on acceptability of employing women and on the attitudes to different kinds of work. The price of capital will depend upon degrees of monopoly in the economy."[11] Thus shadow prices are difficult to ascertain under the existing institutional framework of underdeveloped countries.

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9. *Ibid*.,

10. I.M.D. Little, "Project Analysis in Relation to Planning in a Mixed Economy," in *Development Problems*. OECD, Paris, 1967.

11. W.A. Lewis, *op. cit.*

Fourth, another difficulty arises with regard to the *time dimension*. The concept of shadow prices is static and timeless, for shadow prices are used to overcome the difficulties involved in project evaluation and programming when factor prices change *over time*. All inputs and outputs are valued at fixed shadow prices in such cases. This is not realistic because, as Tinbergen himself pointed out, "the realization of investment pattern will itself influence these *intrinsic values*, but only after some time, since investment processes are essentially time-consuming."[12] If accordingly, labour, capital, foreign exchange and other products are assigned different, they may give contradictory results in accordance with the time-period considered. Hence the

concept of shadow prices remains essentially a static one.

Fifth, if shadow prices are calculated in terms of Qayyum's definition, they require the calculation of marginal productivity of factors by the government and the manipulation of the system of subsidy and taxation in such a way as to equate the supply prices of factors to the value of their marginal productivity. But it is not easy to calculate the marginal productivity of factors (especially of capital and labour), and producers' response to changes in taxes and subsidies. Thus, the shadow prices based on marginal productivity are also indeterminate.

Sixth, another practical difficulty that arises is that of using shadow prices in the economy where the private enterprises buy inputs and sell outputs at market price. The government, on the other hand, uses shadow prices for the evaluation of its projects but buys all inputs at market prices and sells outputs at competitive market prices where she does not possess a monopoly.

Seventh, the determination of shadow prices is difficult in the case of projects with high capital-intensity and which are substitutes and complementary to each other. Suppose there are two projects in which the input of one is the output of the other, and vice-versa. In such cases the determination of the accounting prices of the inputs of labour, capital and foreign exchange will not only be difficult but impossible because the decision about the construction plans of the two projects cannot be the same.

Eighth, often prices of such services as electricity and transport are regulated by the government, and are not fixed on the basis of social opportunity cost. "For example, the prices of electricity used in feasibility studies of industrial projects in many developing countries are derived as an average charge of a two-part tariff. Since a two-part tariff charges a consumer according to his individual demand, rather than the system peak demand, it will fail to reflect the long-run incremental cost (hence the social opportunity cost of electricity)."[13]

Conclusion. Prof. Myrdal in his "*Asian Drama*" regards shadow prices as "utterly unreal and other worldly in concept, particularly in underdeveloped countries like those in South Asia... as it is recognised that they cannot be definitely ascertained.... This abstract and metaphysical concept cannot help to solve the theoretical and practical problems facing South Asian planners. It

stands out as a typical example of the pseudo-knowledge, given a learned and occasionally mathematical form, that unfortunately has formed a major part of the contribution of Western economies to the important tasks of ascertaining the facts in underdeveloped countries and creating a framework for policies designed to engender and direct development."[14]

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12. Tinbergen. *op. cit.* Italics mine.

13. Ajit K. Dasgupta, *op. cit.*, p. 92.

14. Asian Drama— *An Enquiry into the Poverty of Nations*, pp. 168-69. Italics mine.

USES OF SHADOW PRICES

Despite these difficulties shadow prices possess the following uses:

1. In Project Evaluation. The use of market mechanism for the determination of product and factor prices is not a perfect and correct method because it leads to a wrong allocation of resources. In underdeveloped countries, the market mechanism operates imperfectly due to a number of economic and social obstacles. Therefore, it is not possible to have project evaluation on this basis. Even otherwise, the rise in prices being inevitable during the process of planning, it is therefore not possible to correctly assess the costs and benefits of a project. "Accounting prices are a convenient tool for evaluating investment projects in different sectors of the economy....A factor that is expected to be in short supply should have an accounting price higher than its market price, while one that is surplus should have a valuation that is lower than its market price."'[15]

Thus shadow prices are used for evaluating the effects of a project on the national income which are also termed as external effects. This is often done on the basis of the profitability criterion or cost-benefit analysis where both costs and benefits are calculated at accounting prices. Sometimes even rough estimates of shadow prices also help. "They may, for example, show how sensitive the priority figures of a number of projects are to changes in such accounting prices. They may enable us to classify products in groups that are attractive under certain specified emergency circumstances...It may nevertheless have a rough guide for emergency cases."[16]

2. In Public Policy. The success of development planning depends upon the correct operation of public policy. Shadow prices are intrinsic prices on whose correct determination depends the success of a plan to a considerable extent. In a mixed economy, the public sector cannot be developed unless the prices of labour, capital, foreign exchange and other inputs are determined in accordance with shadow prices. Though very often shadow prices are rough estimates, yet the state should try to bring market prices close to the shadow prices of products and factors through fiscal, monetary and other measures for the successful implementation of the plans.

3. In Programming. Shadow prices have the greatest importance in programming. Programming is the working of the economy in a rational, consistent and co ordinated manner. The main aim is to maximise the national income through time. For this, it makes an optimum use of the amount and composition of investment, and adopts public investment, fiscal, monetary and commercial policies. In the context of under developed countries, programming implies the optimum use of investment whereby there is no difficulty in the production process. But in reality, the difficulties of supplies of factors, rise in market prices and the scarcity of foreign exchange is apparent in such economies. All such difficulties are overcome with the help of shadow prices, and fiscal, monetary and other policies help in bringing the market prices of factors, products and foreign exchange in conformity with their shadow prices and thus make programming a success.

In the case of linear programming for a wide class of problems, the variables in the dual solution can be interpreted as shadow prices or accounting prices, in as much as they are the 'correct' input prices being consistent with the maximum value of the primal objective function.... When these shadow prices are imputed to the given inputs, the value of the dual objective function is minimised. It can then be interpreted as the minimum input cost, subject to the constraints, and to the requirement that no profits be made. These shadow prices are, therefore, not different from the factor prices that would emerge in perfectly competitive equilibrium in which product prices are exogenously determined."[17]

Thus the technique of shadow prices serves as a useful computational shorthand in devising a relatively efficient system of project evaluation and

helps in achieving success in programming and public policy.

15. UN, ECAFE. *op. cit.*

16. J. Tinbergen, *op. cit.*

17. J. Mishan, *op. cit.* Italics mine.

CHAPTER

Project Evaluation and Cost-Benefit Analysis

MEANING

Project evaluation is the most specialized planning process which involves systematic, objective and comprehensive appraisal of development programmes for individual commodities and projects. It implies an appraisal or assessment of a project as to its operational efficiency technically, economically, financially and managerially. It involves a probe by a group of outside experts into the working of a project, to find out its achievements and weaknesses and to suggest ways and means of overcoming the weaknesses to improve its operation. Project "evaluation *thus* refers to the procedures of fact-finding about the results of planned social action which in turn move the spiral of planning over upward. It is the proper methodological accompaniment of rational action."[1]

Project evaluation is an integral part of any development programme in order to assess its success or failure and to point out further lines of improvement. It is a process to evaluate the rate of return on a project, its social profitability and its side effects on the growth rate of population, on employment, labour

and management training and on rate of reinvestment. Further, it helps to assess the impact of the new project on the people of the area especially of their social and economic conditions. “Evaluation is, therefore, an essential aid to policy. It may be considered to be a branch of research which is oriented primarily to the needs of an action programme.”[2] “Project evaluation utilizes principles similar to those...for the evaluation of industrial sectors, but it requires more extensive study of individual elements. Whereas sector analysis is applied only to the typical cost and demand conditions in the industry, project analysis takes into account a variety of supply and demand factors that are peculiar to the commodities and production technique under consideration.”[3]

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1. Hyman, Wright and Hopkins, *Applications of Mothods of Evaluations*, 1962. Italics mine.

ITS STAGES

It involves *four stages :* (*i*) to review the situation before the project is actually started; (*ii*) to make appraisal when the project is in operation in order to find out how much has been accomplished and what remains to be accomplished; (*iii*) to suggest ways and means to improve its operation further and to plug loopholes; and (*iv*) to evaluate the ends achieved by the project when it is complete and is in full operation.

METHODS OF EVALUATION

In the methods of project evaluation, the usual stages are : (a) the description of the technical and economic characteristics of each project; (b) the estimation of the influence of the project on the economy, both during the construction period as well as during the operational period, when the investment is completed and the newly productive capacity is in operation; (c) the evaluation of the consequences of the project which may be direct or indirect. The direct effects consist of the immediate contributions to production within the sector of the project while the indirect effects are those in sectors vertically connected with the sector, either preceding or following, because for their direct technological links; and (d) the formulation of the criterion for the selection of the projects.[4]

COST-BENEFIT ANALYSIS[5]

In appraising projects from the national viewpoint the most appropriate and popular method is the cost-benefit analysis. This analysis is the most scientific and useful criterion for project evaluation. It helps the planning authority in making correct investment decisions to achieve optimum resource allocation by maximising the difference between the present value of benefits and costs of a project. It involves the enumeration, comparison and evaluation of benefits and costs. This implies weighing of the returns against the costs involved in a project. Thus the cost-benefit analysis "purports to describe and quantify the *social* advantages and disadvantages of a policy in terms of a common monetary unit." Its objective function is the establishment of *net social benefit*. This objective function can be expressed as **NSB=Benefit–Costs**, where benefits and costs are measured in terms of 'shadow' or 'accounting' prices of inputs and outputs instead of in actual market prices.

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2. *Second Five Year Plan*,1956.

3. UN, ECAFE, *Formulating Industrial Development Programmes*, 1961.

4. H.C. Bas in "Regional Economic Planning, Techniques of Analysis for Less Development Areas", *UN Manual on Economic Development Projects*, 1958.

5. American economists use the term Benefit-Cost.

EVALUATION ON THE BASIS OF COST-BENEFIT CRITERIA

There are four benefit-cost criteria discussed by the *US Sub-Committee on Benefits and Costs*. They are *B–C, B–C/I,* $\Delta B/\Delta C$,and *B/C,* where *B* and *C* refer to benefits and costs respectively, *I* relates to direct investment and Δ is incremental or marginal.

Of these, the criterion *B-C/I* is for determining the total annual returns on a particular investment to the economy as a whole irrespective of to whom these accrue. Here *I* does not include the private investment that may have to be incurred by the beneficiaries of the project, such as the cultivators from an irrigation project. If the private investment happens to be very large, even a

high value of *B–C/I* may be less beneficial to the economy. Thus this criterion would not give satisfactory results. The criterion $\Delta B/\Delta C = 1$ is meant to determine the size of a project that has already been selected and is not for selecting a project. The adoption of the *B–C* criterion would always favour a large project, and make small and medium size projects less beneficial. Thus this criterion can only help in determining the scale of the project on the basis of the maximisation of the difference between *B* and *C*. But the best and the most reliable criterion for project evaluation is *B/C*. In this criterion, the benefit-cost ratio is the measure for the evaluation of a project. If $B/C = 1$, the project is marginal. It is just covering its costs.

If $B/C > 1$, the benefits are more than costs and it is beneficial to undertake the project. If $B/C < 1$, the benefits are less than costs and the project cannot be undertaken. The higher the benefit-cost ratio, the higher will be the priority attached to a project. Since capital and other investible resources are scarce in underdeveloped countries, it can maximise output by using them on a project so that its benefit-cost ratio is higher than that of the next alternative project.

This formula does not take into account the 'time horizon' of the project. As a matter of fact, *future* benefits and costs cannot be treated at par with *present* benefits and costs. Therefore, the appraisal rules for project evaluation require discounting of future benefits and costs because society prefers the present to the future. For this purpose, economists have devised a number of 'decision rules' or criteria. But we shall confine ourselves to the present value criterion and the internal rate of return criterion.

The Net Present Value Criterion. It is an important criterion used for project evaluation. Net Present Value (NPV) is equal to the present value of benefits *minus* the present value of operating and maintenance costs *minus* initial outlay. This criterion is also expressed as the net present value of benefits (NPVB) criterion so that *Net Present Value of Benefits = Gross Present Value of Benefits–Gross Present Value of Costs*. A project is socially profitable if the NPVB>0. If there are number of mutually exclusive projects, the project with the highest net present value of benefits will be chosen.

But the explanation of the NPV criterion in terms of benefits and costs is not a correct method for project evaluation because it neglects the time horizon. Capital investments give benefits after a lapse of sometime. Therefore, future

benefits and costs cannot be equated with present benefits and costs. Since society gives preference to the present over the future, it becomes essential to discount future benefits and costs of projects. The discount factor is expressed as

$$D = \frac{1}{(1+i)^1}$$

where *i* is the social discount rate and *t* is the lime period.

Thus

$$NPV = \left[\frac{B_1}{(1+i)} + \frac{B_2}{(1+i)^2} \ldots + \frac{B_n}{(1+i)^n}\right] - \left[\frac{C_1}{(1+i)} + \frac{C_2}{(1+i)^2} \ldots + \frac{C_n}{(1+i)^n}\right]$$

where B_1, B_2.. . B_n are series of gross present benefits in years 1, 2. . . *n;* C_1, C_2. . . C_n are series of gross present costs in years 1, 2. . . *n; i* is the social rate of discount for annual compounding.

In making a choice among projects either of the two rules may be followed.

1. Only those projects should be selected in which the present value of benefits exceeds the present value of costs. Where symbolically

$$\frac{B_1}{(1+i)} + \frac{B_2}{(1+i)^2} \ldots + \frac{B_n}{(1+i)^n} > \frac{C_1}{(1+i)} + \frac{C_2}{(1+i)^2} \ldots + \frac{C_n}{(1+i)^n}$$

2. All projects where the ratio of the present value of benefits of the present value of costs is greater than *one*. Expressed symbolically

$$\frac{\frac{B_1}{(1+i)} + \frac{B_2}{(1+i)^2} + \ldots + \frac{B_n}{(1+i)^n}}{\frac{C_1}{(1+i)} + \frac{C_2}{(1+i)^2} + \ldots + \frac{C_n}{(1+i)^n}} > 1$$

The NPVcriterion is considered as the most appropriate rule for project evaluation.

The Internal Rate of Return Criterion. This criterion refers to the percentage rate of return implicit in the flows of benefits and costs of projects.

Marglin defines the internal rate of return (IRR) as the discount rate at which the present value of return *minus* costs is zero.[6] The formula for the calculation of IRR is

$$\frac{B_1 - C_1}{(1+r)} + \frac{B_2 - C_2}{(1+r)^2} + \ldots\ldots \frac{B_n - C_n}{(1+r)^n} = 0$$

where *r* is the internal rate of return. In the case of mutually exclusive projects that project should be selected which has the highest rate of return.

Its Limitations. this criterion has certain limitations.

First, once a rate of return is assumed for the calculation of the profitability of a project, it is not possible to change it.

Second, it is difficult to calculate the rate of return on a long-gestation project which does not yield benefits for a number of years.

Third, if projects are mutually exclusive, this criterion favours that project which has a lower capital cost than others. Thus it cannot be applied to highly capital-intensive projects.

Fourth, the use of IRR for public investment does not lead to correct decisions because the definition of IRR implies that intermediate receipts and outlays are also discounted at the internal rate. But it is not possible to discount intermediate benefits and costs of public investment at the internal rate of return.

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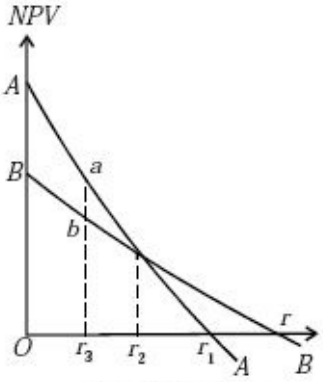
6. S.A. Marglin, *Public Investment Criteria*, 1967.

Fifth, there are often such projects on which the entire investment outlay cannot be made in the first period. It becomes difficult to calculate IRR in all such cases.

Sixth, the IRR criterion is suitable for such investment projects which are wholly independent of others. The different projects can then be ranked according to their internal rates of return and the project with the highest IRR is chosen first and the other projects with lower IRR are selected according to

their ranks. But the fact is that public investments are not independent of each other. Often they are alternatives. Therefore, it is difficult to make a choice between two alternative investments on the basis of their alternative internal rates of return.

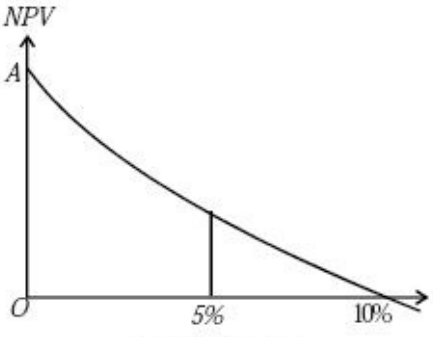
Seventh, Layard points out the problem of capital rationing where projects cannot be selected on the basis of ranking in order of rate of return. Such projects can only be selected on the basis of their net present value.[7]



Rate of Discount
Fig. 1

In fact, IRR depends on the social rate of discount. If the net present values of two alternative projects are given, the choice of the project will depend on the discount rate. This is illustrated in Figure 1 where the rate of discount is measured along the horizontal axis and NPV on the vertical axis. The curve *AA'* depicts investment of project *A* and the curve *BB'* of the project *B.* The IRR of project *B* is higher than that of project *A* because the discount rate *Or* is higher than *Or ´*. At Or_2, the IRR of both the projects is equal. But if the discount rate falls below Or_2, project *A* will be chosen because its NPV is higher by *ba.* Making a choice between two projects on the basis of changes in the discount rate is called *switching* and *reswitching.*

Relation between NPV and IRR. The relation between NPV and IRR is depicted in Figure 2. As NPV falls, the discount rate increases and a situation arises when NPV becomes negative. The rate at which NPV changes from positive to negative is the IRR. That project will be selected whose IRR is higher than its discount rate. So the right criterion for the choice of project is *r*> *i.* This is illustrated in Figure 2 where IRR is taken as 10 per cent and the discount rate as 5 per cent in the case of project *A.* This project will be selected for development so long as its NPV>0 and *r* (10%)> *i* (5%). If two projects are complex, these two criteria can give different results. But for the majority of projects, they are interchangeable. However, difficulties arise when two or more projects have to



Rate of Discount
Fig. 2

be compared and their lengths of life and capital investments differ. Of the two criteria, NPV is more commonly used for project evaluation in private and public sectors. But the NPV criterion is technically superior, since the IRR can give an incorrect result in special circumstances.

The Social Rate of Discount. Whether the planners use the NPV or IRR criterion, a rate of discount is needed for discounting all costs and benefits. There is considerable controversy over the choice of such a rate. The controversy arises because the discount rate is required to solve two problems: *first*, proper allocation of resources between the public and private sectors; and *second*, the allocation of resources between the provision of present and future goods and services. The rate used to solve the second problem is called the *social discount rate* or *social time preference rate*.

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7. Richard Layard, *Cost-Benefit Anaysis*, 1972.

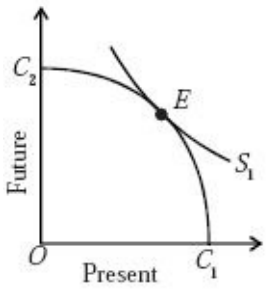

Fig. 3

The social discount rate is the premium which the society puts for preferring the present consumption to future consumption. This is explained in Figure 3 where the present consumption C_1 is taken on the horizontal axis and the future consumption C_2 on the vertical axis. C_1C_2 is the transformation frontier or the investment possibility curve. It consists of a series of projects arranged from right to left in order of their rate of return. The cost is the sacrifice of present consumption and the return is the gain of consumption in the future. The society will choose from the various investment possibilities so as to reach its highest social indifference curve S_1. The society reaches an optimal position with regard to its sacrifice of present consumption and invests it for gain in the future consumption when its transformation curve C_1 C_2 equals its social indifference curve S_1 at point *E*. It is to be noted that the *slope of the transformation curve represents the rate of return on investment* and the *social indifference curve represents the rate of time preference*. So the social discount rate is determined with the equality of the rate of return on investment and the rate of time preference at point *E*.

The social rate of discount is a constant rate over time. The choice of a

discount rate affects the projects to be undertaken. A discount rate of 5 per cent might well lead to twice as much investment as one of 10 per cent, together with equivalent reduction in consumption. If the discount rate is high, short-period projects with higher net benefits are preferred. On the contrary, when the discount rate is low, long-period projects with lower net benefits are selected.

The problem is: *How a social discount rate is chosen*? This rate cannot be the market rate of interest in a mixed economy because of uncertainties and imperfections of capital markets. There are varieties of securities with corresponding multiplicity of interest rates. Therefore, the social discount rate should equal the government's borrowing rate on long-term securities because these securities are essentially riskless. That is why the majority of economists measure the social rate of discount at this rate. But critics argue against selecting the long-term rate on government securities as the social discount rate. According to them, there are numerous borrowing rates on government securities relating to different time periods. The problem is which rate to choose as the social discount rate. Again, government borrowing rates are influenced by such factors as the monetary policy which is not relevant for the choice of a social discount rate. Moreover, the choice of such a social discount rate would lead to the very awkward problem that different rates of interest would be used in the public and private sectors. There is then likely to be considerable inefficiency in the allocation of funds inside the investment sector in the sense that if the government is, say, responsible for electricity and the private sector for oil, inferior projects of the former kind will supplant superior projects of the latter kind. Economists, therefore, reject the use of market rates to reflect the social discount rate.

Pigou,[8] followed by Dobb,[9] regards the use of social time preference rate as "pure myopia." He alleges that people are victims of "defective telescopic faculty" that is why they prefer present consumption to future consumption. They have risk-of-death time preference. Pigou and Dobb reject this view on the ground that society is a continuous entity and it has a collective responsibility for future generations. So they favour a zero social time preference rate because the present and future should have equal weights in the estimation of the society.

But economists do not accept Pigou-Dobb view. According to Marglin[10] this view is an "authoritarian rejection of individual preferences." Sen[11] and Eckstein[12] point out that a rational fear of death is sufficient for people to have a positive social time preference rate.

Hirschleifer[13] and others use the concept of *social opportunity cost* to measure the social discount rate. The social opportunity cost is a measure of the value to society of the next best aiternative use to which funds employed in the public project might otherwise have been put. The next best alternative use of funds is investment in the private sector. If they earn a rate of 6 per cent, the public investment must also earn a rate of 6 per cent or more. Thus the social discount rate is 6 per cent. Any other rate than this would lead to malallocation of resources. If a public project earns 4 per cent, it should not be undertaken.

The social opportunity cost method of calculating the social discount rate is not free from certain limitations. To depend on the estimates of the private sector is misleading because different industries adopt different methods for estimating their rates of return. Thus it is difficult to find a rate of return which may measure the social opportunity cost of funds. According to Feldstein, the social opportunity cost depends on the sources of particular funds, so it must also reflect the social time preference function. He, therefore, suggests a method of combining the two. The procedure is to allow for the social opportunity cost of funds directly by placing a shadow price on the funds used in the project and to make all intertemporal comparisons with a social time preference rate.[14] Mishan, on the other hand, has suggested that if the government has the power to invest in the private sector, the social opportunity cost rate can be used as a social discount rate.[15]

Marglin and other economists have argued for a *synthetic discount rate*. They move on this presumption that the social time preference rate is less than the social opportunity cost rate. Therefore, there will be underinvestment in the economy which requires a synthetic discount rate for public investment. The synthetic discount rate is some weighted average of the social time preference rate and the social opportunity cost rate.

Baumol[16] does not agree with Marglin that there should be a synthesis of the

two rates. He regards the choice of rates as indeterminate because of the existence of risk and institutional barriers which will prevent the two rates to be in equilibrium. On the other hand, Pearce[17] suggests that the correct answer to the choice of a social discount rate does not lie in the selection of a *single* rate, but in the use of both the social time preference and the social opportunity cost rates according to (*a*) the type of benefits yielded, and (*b*) the type of forgone expenditure. In Figure 3, the social time preference rate is in equilibrium with the social opportunity cost rate at point *E*. Pearce concludes that it will not matter which rate is chosen. If equilibrium conditions prevail, the necessity for the estimation of a synthetic discount rate disappears.

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8. A.C. Pigou, *The Economics of Welfare*, 4/e, 1932.

9. M. Dobb, *An Essay on Economic Growth and Planning*, 1960.

10. S.A. Marglin, "The Social Rate of Discount and the Optimal Rate of Investment." *Q.J.E.* Vol. 77, 1963.

11. A.K. Sen, "Optimissing the Rate of Saving," *E.J.* Vol. 71, 1961.

12. O. Eckstein, "A Survey of the Theory of Public Expenditure," in J.M. Buchanan (ed.). *Public Finance*, 1961.

13. J. Hirschleifer et *al. Water Supply*, 1960.

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EVALUATION ON THE BASIS OF BENEFITS

A project is evaluated on the basis of the benefits accruing from it. Benefits refer to the addition to the flow of national output accruing from a project. A project is beneficial to the extent it tends to increase the income of the people, increase in income being measured by the actual increase in production and consumption. Benefits may be *real* or *nominal* and *direct* or *indirect.*

Real Benefits. In cost-benefit analysis we are concerned with the real benefits rather than with the nominal benefits flowing from a project. A river valley

project may increase irrigational facilities to the cultivators, but if at the same time the state levies heavy betterment levy on them, the benefit is nominal. For, whatever benefit accrues from the project, it goes to the treasury. But if the same project, besides increasing irrigational facilities, raises the productivity of land per acre and leads to a number of other external economies whereby the level of real income of the farmers rises, then it is said to lead to real benefits.

Direct and Indirect Benefits. Direct benefits are those benefits which are immediately and directly obtainable from a project. They are the values of the immediate products and services for which direct costs are incurred. A number of direct and immediate benefits flow from a multipurpose river valley project such as flood control, irrigation and navigation facilities, development of fisheries, power, etc.

A multipurpose project may also lead to certain *indirect* benefits or side-effects. Indirect or *secondary* benefits are the values added to the direct benefits as a result of the activities *stemming from* or *induced* by the project. For instance, the construction of the Bhakra Nangal Project has provided employment opportunities to thousands of people. It has led to the construction of a new railway line connecting Nangal township and the Bhakra Dam with the rest of the country. New roads have been laid. A new town, Nangal, has come up. A fertilizer factory has been started there which is the harbinger of more factories. The Bhakra Nangal Dam has been developed into a tourist-resort, thereby augmenting income. Besides, as pointed out by Professor Bruton, project evaluation should take into account the effects of a project on the rate of investment, on the growth rate of population, on the acquisition of skills and managerial talents by the people.[18] All these are indirect benefits or side-effects which are more or less incidental to the direct benefits.

Tangible and Intangible Benefits. A project may also lead to tangible or intangible benefits. Tangible benefits are those which can be computed and measured in terms of money while intangible benefits cannot be measured in monetary terms. For example, benefits flowing from the Bhakra Nangal Project are tangible and can be computed. Intangible benefits enter into individual valuations, for which there is neither a market nor a price. They may be positive or negative. The former are the scenic beauty and recreational

value of the Bhakra Dam while the latter refer to the uprooting of the people as a result of the Dam.

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18. H.J. Bruton, Principles of *Development Economics*.

EVALUATION ON THE BASIS OF COSTS

Just as there are various forms of benefits, so there. are various types of costs

Project Costs. They are the value of the resources used in constructing, maintaining and operating the project. They relate to the cost of labour, capital, intermediate goods, natural resources, foreign exchange, etc., including allowances for induced adverse effects.[19]

Associated Costs. They are the value of goods and services needed beyond those included in the cost of a project to make the immediate products or services of the project available for use or sale. For example, the farmer's cost of producing the irrigated crop, other than any charge for water, would be his associated costs of producing that crop.

Real and Nominal Costs. Costs may be real or nominal. If a Block Samiti borrows from the people of the area for digging a canal, it is a case of nominal costs. For no real sacrifice is involved on the part of the people, money having been transferred to the Block Samiti from the people. But if the people of the block are asked to dig the canal themselves, it would be real cost for them.

Primary or *Direct Costs.* In cost-benefit analysis, we are concerned more with primary or direct costs. These are costs properly incurred for the construction, maintenance and execution of a project. And to make immediate products of the project available for use or sale.

Indirect or *Secondary Costs.* They are the value of goods and services incurred to provide indirect benefits of a project, *viz.*, houses, school, hospital, etc., for the people working at the project site. They also include the costs of processing the immediate products of the project.

IMPORTANCE OF DATA FOR EVALUATION

In project evaluation detailed data extending over a long period are required which may be divided into "an investment or gestation period" and "an operation or production period." The project is completed in the first period and is used in the second period when production starts. The data describe the number of workers and other personnel involved, the amount of raw materials required and the quantity of the products expected to be produced, etc. These data are compared with similar projects elsewhere in terms of their costs and benefits. The data are also used to calculate the contribution of the project to national output, to the employment of labour, and to the health of the workers.

Conclusion. Thus in evaluating a project, we are to compute and compare its total direct benefits and the total direct costs. If it is found that the benefits are expected to be more than the costs, it will be beneficial to undertake the project, otherwise not. In order to arrive at the aggregate direct costs and benefits, *first*, data are collected and calculated on the physical quantities of goods and services produced; *secondly*, on the physical quantities of goods and services consumed *thirdly*, the money value of these goods and services is computed on the basis of price indices in different markets giving weights to inflationary and deflationary situations; and *lastly*, in calculating annual costs, due regard is to be taken of the durability of capital assets and their depreciation.

Annual costs are calculated by dividing the total costs by the expected life of capital assets. Similarly, annual benefits are calculated by computing the money value of direct benefits flowing from the projects and deducting from it associated costs of the project.

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19. For use of Shadow prices in project evaluation, see 'Partial Equilibrium Method' in the chapter on 'Shadow Prices'.

LIMITATIONS OF COST-BENEFIT ANALYSIS

However, limitations arise in cost-benefit analysis of measuring the present and future benefits from a project, and costs incurred in obtaining these benefits.

1. Difficulties in Cost Assessment. Cost assessment of a project is comparatively easy than benefit assessment. Cost estimates are made on the basis of the choice of techniques, locations and prices of factor services used. But market prices, particularly those of factors of production, form an imperfect guide to resource allocation in underdeveloped economies, because there exist fundamental disequilibria which are reflected in the existence of massive underemployment at present level of wages, the deficiency of funds at prevailing interest rates, and the shortage of foreign exchange at current rates of exchange. The equilibrium level of wage rates will be considerably lower than market wages, while equilibrium interest rates will probably be much higher than market rates. To remove these difficulties, the use of shadow or accounting prices has been suggested by J. Tinbergen and H.B. Chenery and K.S. Kretchmer.[20] These shadow prices reflect intrinsic values of factors of production. Like shadow prices, the concept of shadow costs has also been introduced to calculate the real costs of a particular project to society. Nowadays economists use shadow prices and costs in evaluating projects and determining which are worth undertaking and which are not.

2. Difficulties in Benefit Assessment. The assessment of benefits is still more difficult due to the presence of the element of uncertainty in a new project as to the correct estimation of future price, demand and supply of its product. Another difficulty of measuring the benefit is the assessment of external economies. If the *presence* of external economies leads to the selling of the product at marginal costs rather than at average costs, deficit will accrue. Efforts to cover this deficit through a levy on the consumer or the government budget make the assessment of benefits more vague. Thus according to Professor Lewis, "To calculate the true net social benefit of an investment calls for skepticism as well as skill. The figures submitted to governments almost always involve exaggerated optimism and double counting. If one uses low shadow wage in valuing labour, when calculating costs, one must not also, when calculating benefits, give extra credit to the project because it will relieve unemployment. Shadow pricing may be applied to costs or to benefits, the same item should not appear in both. Again, annual values and capital values should not be added together."[21] But it is difficult to predict changes in shadow prices arising from the benefit of a project. The application of shadow prices might favour quick-yielding, labour-intensive, capital and import-light projects thereby undermining the establishment of long-term development

projects.

3. Arbitrary Discount Rate. The assumed social rate of discount for any project is likely to be arbitrary. If an arbitrarily large discount rate is applied to calculate the net present value of benefits, it is not possible to effectively calculate the long-run results of a project. This equally applies to the internal rate of return of a project.

4. Neglects Joint Benefits and Costs. The above analysis of cost benefit ignores the problems of joint benefits and joint costs arising from a project. We have seen above that a number of direct and indirect benefits flow from a river valley project. It is difficult to evaluate and calculate such benefits separately. Similarly, they involve joint costs which cannot be separated and hence calculated benefit-wise.

5. Ignores Opportunity Costs. The cost-benefit analysis also ignores the problem of opportunity cost. Griffin and Enos have found a way out when they state that if all prices reflected opportunity costs, all projects for which $B/C < 1$ would be chosen.

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20. See the previous chapter for a detailed study.

21. Development Planning, p 258.

6 Adjustment for Risk and Uncertainty. The problem of adjustment of risk and uncertainty involved in the project also arises. This is done in three ways: at the time of calculating the length of project life, the discount rate, and by making due allowance in benefits and costs. It is better to use the government borrowing rate. The Research Programme Committee of the Indian Planning Commission suggests 5 per cent as the productivity rate and 10 per cent as capital scarcity rate.

7. The Problem of Externalities. The side effects of a project are difficult to calculate in this analysis. There may be technological and pecuniary spillovers (or externalities) of a river valley project, such as the effects of flood control measures or a storage dam on the productivity of land at other places in the vicinity. It is difficult to calculate such external effects of a project.

USE OF COST-BENEFIT ANALYSIS IN DEVELOPING COUNTRIES

The cost-benefit analysis was developed in the United States for the appraisal of investments in irrigation and transportation projects. In LDCs, projects are often selected on an *ad hoc* basis and sufficient attention is not given to their evaluation in terms of costs and benefits. Since all public projects are related to the objectives of growth, they aim at maximising social welfare.

Stephen Marglin points toward three merits of cost-benefit analysis for such countries. *First*, it helps in *reducing differences* in the marginal effectiveness of alternative measures for accomplishing such objectives as between irrigation and other means of raising agricultural production. *Second*, it helps in *assessing the costs* of fulfilling one objective in terms of benefits sacrificed with respect to others. *Third*, it has *a political advantage* in that, "it would be difficult for any particular group to distort project plans to serve its own interests if its consent, along with the consent of other relevant sections of the community, were obtained at the time of setting the criteria in advance of planning specific projects."

Another merit of the use of cost-benefit analysis is that it permits *decentralised decision-making*. Even if the public sector is small, no single authority can hope to handle the vast mass of technical information needed to decide on a number of specific projects. In order to calculate costs and benefits of each project, a separate authority is needed for each. This, therefore, necessitates decentralisation of decision making.

Again, the cost-benefit analysis is "a *practical way* of assessing the desirability of projects, where it is important to take a long view (in the sense of looking at repercussions in the future, as well as the nearer future) and a wide view (in the sense of allowing for side effects of many kinds on many persons, industries, regions, etc.)."[22] As such, it is a highly useful tool for project evaluation in developing countries.

ITS DIFFICULTIES

The use of cost-benefit analysis is best with a number of difficulties in LDCs.

They are discussed below.

(*a*) *Based on Conditions of Developed Countries.* This technique is based on the basic assumption that investment is made in a framework of economic stability and steady growth in a predominantly capitalist competitive economy where prices are constant, wages are flexible, and factors are perfectly mobile and fully employed. Thus the need for state action is assumed away in it. Under the assumptions, direct benefits of the project valued at market prices reflect its social benefits. But these assumptions make the application of cost-benefit analysis as a method of project evaluation unrealistic to underdeveloped countries. In such economies, the assumptions of constancy of prices, the existence of full employment, perfect mobility of factors and flexibility of wages are unwarranted. Rather the aim of public investment is to start those development projects which aim at reducing unemployment and underemployment, and increasing factor mobility so that structural disequilibrium in the economy is set right. Though efforts have been made to modify this analysis by including indirect benefits accruing from a project and imputing benefits and costs in terms of shadow prices, yet there is arbitrariness in choosing between the various indirect benefits. Eckstein and Mckean, therefore, favour the use of macroeconomic planning methods instead of the cost-benefit technique for the evaluation of projects. But these methods cannot be applied to underdeveloped countries due to the lack of statistical data.

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22. A.R. Prest and R. Turvey, *op. cit.*

(*b*) *Difficulty of Obtaining Data.* In underdeveloped countries the task of obtaining data are one of the biggest hurdles. It is, therefore, not possible to distinguish the benefits accruing to the people with and without the project. The element of uncertainty and the difficulties of assessing externalities also stand in the way of correct assessment of benefits from a project. In certain cases both tangible and intangible benefits are difficult to assess. To what extent the supply of drinking water will benefit the residents of a town from a drinking water project or the building of an embankment to control floods cannot be measured accurately.

(*c*) *Difficulties in Cost Assessment.* Assessing the cost of a project is also by no means easy. Preliminary estimates of costs are prepared but they are either

overestimated or underestimated. Rise in prices, shortage of raw materials and foreign exchange difficulties often stand in the way of accurate cost assessment. In the case of certain projects where *Shramdan* (voluntary labour) is made use of, the measurement of labour cost becomes still more difficult. In India, so many projects have been started hastily that it is not possible to assess their viability. According to Lewis, "Assessing the cost and benefit of new industrial enterprises is highly specialised work which is best left to experienced consultants. Without such specialised knowledge project analysis is bound to be wrong." Underdeveloped countries should develop specialised agencies for evaluating all types of projects.

USE OF COST-BENEFIT ANALYSIS IN INDIA

The first systematic attempt in India was made by D.R. Gadgil by conducting a survey of the Godavari and Pravara canal systems in Maharashtra. This was followed by a study of the benefits and costs of the Hirakund Dam Project on the Mahanadi by Sovani and Nilkanth Rath (*Economies* of *Multipurpose River Dam*, 1960). In 1958, the Planning Commission Research Programmes Committee headed by D.R. Gadgil initiated the study of the benefit-cost ratios of six irrigation projects: (*i*) The Sarda Canal in UP; (*ii*) The Tribani Canal in Bihar; (*iii*) The Damodar Canal in West Bengal; (*iv*) The Gang Canal in Rajasthan; (*v*) The Kavai Methur Project in Tamil Nadu; and (*vi*) The Nizam Sagar Project in Andhra Pradesh. Similar surveys had been conducted by Baljit Singh for the Sarda Canal Project in UP, by K.N. Raj for the Bhakra Nangal Project in Punjab, by A.S. Charan of the West Banas Project in Rajasthan and by Ram Narain of the Jui Lift Irrigation Project in Haryana.

But there is no uniformity in the application of cost-benefit techniques in these studies. These studies have been made either on the basis of the 'before and after' technique or the 'with and without' technique. The 'before and after' technique takes into account the benefits and costs before the introduction of the projects and compares the same with the benefits and costs that have resulted after the introduction of the project. The 'with and without' technique makes a comparative study of the same area being benefited with irrigation facilities and without such facilities.

SOME SUGGESTIONS

To overcome the limitations of cost-benefit analysis, certain suggestions are made for a better appraisal of projects. It is contended that projects should be appraised in combination rather than individually even though they happen to be of a different nature. The benefits should be measured both in their positive and negative aspects. Scarce factors used should be counted as negative benefits while positive benefits induced by investment in the project should make an addition to the national product. Both direct and indirect benefits should be included. In case market prices do not reflect equilibrium prices, shadow prices should be used for evaluating the effect of the project on the national economy. In underdeveloped countries, the market wage for unskilled labour is often higher than the opportunity cost of labour. On the other hand, the intrinsic values of capital and foreign exchange are higher than their corresponding market prices. An accounting wage lower than the market wage and an accounting interest rate and an accounting foreign exchange rate higher than the market prices should be used. The costs should include the value of scarce factors used in the project at accounting prices. The influence of an investment project on the national product should not be measured only in one year but also in time, along with its influence on employment, balance of payments, regional income distribution, etc. Weights should be given to each of these elements in order to mention the following factors for inclusion into the evaluation procedure.

1. Variation in Output Over Time. This factor is of special importance in the case of those projects which have a long fruition lag such as river valley projects. Since such projects take a long time to fructify, a discounting of future costs and prices is necessary for purposes of evaluation.

2. Variation in the Range of Commodities Produced. Different techniques of production produce different qualities of product. Small scale production techniques are generally more flexible than production techniques under large scale. This factor makes project evaluation somewhat difficult.

3. Scale and Location Effects. In order to select the optimum scale of production for a particular project an estimate of the increase in demand over time is to be made. Further, there are likely to be certain diseconomies arising from over concentration of a project in a few centres, increase in transport costs, and difficulties of operating large scale plants. Only some of these effects can be evaluated quantitatively.

4. Non-market Effects of Production Differ from Project to Project. The use of an advanced technology may be held in training labour and management for industrialization in the long run although this fact is not reflected in the calculation of accounting prices. Other social benefits and costs which, for example, help to reduce undesirable waste, must also be taken into account.

CHAPTER

Controls Under Planning

NEED FOR CONTROLS

Controls are an integral part of a planned economy. But the nature, extent and measure of controls depend upon the type of planning in the country. A centrally planned economy has full control over all economic activities, *i.e*., production, consumption, exchange, and distribution, internal and external trade, saving, investment, etc. On the other hand, a mixed economy has partial controls with the main purpose of allocating scarce resources in a proper way. Underdeveloped countries are mostly mixed economies where public and private sectors co-exist. Planning involves the control and regulation of the private sector for the fulfilment of the objectives of the plan. Left to market forces planning becomes a farce. For in such economies, scarcities and bottlenecks arising from structural changes retard economic development in the absence of controls. To allocate scarce resources among competing ends, the Planning Authority controls the production of goods by deciding what to produce, how to produce and how much to produce? This is tantamount to controlling investment for the purpose of utilizing it in right direction. In underdeveloped countries the Planning Authority controls the use of income also for the purpose of augmenting savings. This is done by controlling consumption of non-essential goods and even by forcing people to save more. The distribution of essential commodities is also controlled and regulated. Since there are adverse balance of payments and acute shortage of foreign exchange, import, export and exchange controls are introduced. Besides, the State controls particular sectors of the economy by taking them over as public enterprises if a high priority has been accorded to them in the plans. They are generally transport, power, basic and heavy industries, basic raw materials, etc.

1. Based on an extension lecture delivered to Post-Graduate Economic Faculty of Government College.. Hoshiarpur in January, 1972.

TYPE OF CONTROLS

Controls may be direct or indirect. *Direct controls*, better known as physical controls, effect particular producers' and consumers' choices in the economy. Such controls are in the form of licensing, rationing, price controls, export duties, import-export and exchange controls, quotas, authorisation, rationing of foreign exchange, anti-hoarding control, monopoly control etc. *Indirect controls*, on the other hand, are known as general controls which affect prices and hence the incomes and transactions within the economy. In fact, they affect the overall aggregate demand of the economy and include fiscal and monetary measures. Thus general controls refer to the taxation, expenditure and borrowing measures of the State and to the monetary policy of the central bank in the form of variations in the bank rate, open market operations and reserve requirements, selective credit controls, etc. We discuss below the nature and problems of physical controls in the light of Indian conditions, general controls in the form of fiscal and monetary measures having already been discussed in two earlier chapters.

AIMS OF PHYSICAL CONTROLS

The aim of physical controls is to ensure proper allocation of scarce resources for the purpose of price stabilisation. An underdeveloped economy is a scarce economy where food, raw materials, consumer goods, capital equipment, basic facilities, foreign exchange, etc. are all in short supply. When it launches a development plan, the aggregate demand for the various resources increases and leads to a rise in the price level. The rise in prices becomes inflationary when bottlenecks and shortages increase as incomes and investment rise more with development. In such a situation, fiscal and monetary measures alone are ineffective in controlling aggregate demand and prices. Thus the need arises for adopting physical controls which tend to affect the strategic points of the economy. Unlike general controls which affect the entire economy, physical controls are discriminatory in nature. They are, therefore, more effective in overcoming bottlenecks and shortages arising in the course of development planning.

1. Control Over Consumption. Consumption may be regulated and controlled in two ways: (*i*) by limiting the production of consumer goods directly through

allocation of raw materials, labour and output quotas; and

(*ii*) by limiting the physical demand for goods through price control and rationing.

Price control and rationing are the legacy of the Second World War when they were resorted to for directing the supplies of essential consumer goods for war purposes. Price controls are less drastic and more comprehensive than rationing and therefore are more useful in distributing the means of production and the supplies of available goods equitably among the people of under developed countries. But in a competitive market for price controls to become successful, rationing is essential. Because prices fixed are at a low level and supplies of commodities at controlled prices are also less than demand. Thus unless there is rationing, price controls lead to queues, unequal distribution and black marketing, and thus defeat the very purpose for which they are resorted to. In India where agricultural production may fall below the targets laid down in the plan due to bad monsoon, drought, etc., food control and rationing are a must. Since a major part of our economy is dependent upon agriculture, price controls over essential consumer goods are also necessary. For instance, shortages in output of cotton, oilseeds, jute and sugarcane are fully reflected in the increased price of textile products, edible oils, jute, and sugar. Except jute products, all other products are essential goods. In India, foodgrain prices are controlled at three levels—producer, wholesaler and retailer. There is statutory rationing in big cities like Mumbai, Kolkata, Chennai and Delhi; at other towns in the country foodgrains and sugar are distributed in fixed quantities and at controlled prices through fair price shops. Prices and supplies of other essential commodities are controlled and regulated through consumers' co-operatives, super bazars, etc. Such commodities are cloth, soaps, vegetable ghee, kerosene oil, baby foods, tyres, tubes, etc.

2. Control Over Investments. In an underdeveloped country, there is shortage of investible funds of right type for investment. Industrial raw materials, food, skilled personnel and foreign exchange are all scarce. Physical controls help in rational allocation and utilisation of these strategic resources. The usual methods of control over investment are fixation of quotas, issue of licences and authorisation on the basis of priorities. Some direct control of investment is inevitable in such economies due to market imperfections. If private

investment is directed towards residential buildings, building permits can be issued. Similarly, to keep factories out of residential areas or to prevent excessive concentration of factories in certain towns for implementing a policy of decentralisation, issuing of building licences on a priority basis are essential. In the case of certain scarce materials produced indigenously like cement, their supplies can be regulated by anti-hoarding controls or quantitative inventory. In those fields of investment where imported machinery, components and raw materials are required, physical controls in the form of import quotas, duties and rationing of foreign exchange are exercised. Private investible funds flowing to joint stock companies may be controlled by restricting capital issues and securities. Thus control over investment by concentrating at strategic points can result in a better use of available resources.

3. Control Over Production. Control over production is closely linked to control over investment. In fact, there is little difference between the two. For instance, it may be necessary to control investment in those industries that tend to displace handicraft workers without affecting the material output substantially. Under development planning, production of certain essential commodities may be accorded a higher priority than non-essential consumer goods. Similarly, higher targets may be laid down for the production of basic raw materials and components like coal, iron ore, iron and steel, chemicals, small tools, cement, etc. They necessitate not only control over investment but also over production in the form of fixation of quotas, authorisations, and licences. Prices of indigenous and imported raw materials and components may be fixed and their quantities allocated according to the requirements of the planned economy.

In India control over investment and production go together. Large scale industry is subject to some specific price and allocation controls and to general capital issue and licensing controls. This has become necessary for the balanced development of different sectors of economy.

In India since independence controlled commodities have been sugar, cotton textiles, steel, coal, aluminium, chemicals, cement, paper, paper board, etc. During the last few years in pursuance of the policy of rationalising controls over prices and distribution of these intermediate and manufactured articles, gradual decontrol has been introduced.

There exists in India a comprehensive system of controls over investment and production to fulfil the objectives and targets laid down in the Plans with regard to the industrial sector. The Industries (Development and Regulation) Act, 1951 enables the State to implement its policies for the planned development and regulation of industries. Under this act, any industrialist who wants to establish a new undertaking or to expand substantially an existing concern or to manufacture a new product is required to take a licence. But it is not that all industries are issued licences. In the government nomenclature there is a banned list which is of course reviewed every year. There is another category of industries known as the merit list where licences are given on merit. But the most important category is that of key industries which are essential for the fulfilment of Plan targets and where the creation of additional capacity is considered essential. Priority is given in issuing licences to such industries as also in permitting them to raise capital internally or externally to import raw materials, equipment, etc. It is not that licensing is a permanent feature and that all industries must be licensed. Rather, for increasing the capacity of certain priority industries not needing foreign raw materials and components any more, delicensing is done. Besides, undertakings employing less than 50 workers and using no power or employing 100 workers and using power and those having fixed assets not exceeding Rs. 25 lakhs are exempted from the provisions of this Act, provided they do not come in the categories enumerated above. A licence issued to an industrial concern includes besides the name of the concern and articles to be manufactured, the annual output of the undertaking, its location and the capital issued.

Another feature of physical controls in India is that production in the basic and strategic sectors, included in Schedule A of the Industrial Policy of 1956 is under complete control of the State. Such industries are arms and ammunitions, atomic energy, heavy plant and machinery, heavy electrical plant mineral oil, aircraft, railway transport, telephones and telephone cables, etc.

4. Import Controls. Import controls in the context of an underdeveloped country aim at shifting imports from non-essential consumer goods to capital goods, raw materials and components for augmenting the rate of industrial growth. Development planning requires that import of certain non-essential and luxury goods prohibited by imposing heavy import duties, while those of essential consumer goods like food, industrial raw materials, components and

capital goods are regulated by import licensing and import quotas. Thus import control in an underdeveloped country have two main features. *First*, prohibition of the import of certain non-essential commodities. *Second*, general or individual licensing which is based on one or more of the following criteria: (*a*) country of origin; (*b*) degree of essentiality; (*c*) quotas and monetary ceilings for individual imports; (*d*) special commitments or obligations; and (*e*) international allocations.

India follows both the prohibitive and licensing policies. The licensing policy in India is primarily based on essentiality, special commitments and international allocations. Before Devaluation, foreign aid was mainly tied to specific projects. But since the middle of 1966-67 emphasis has shifted to non-project form of aid. From time to time import controls have been liberalised to meet the input requirements of certain priority industries in full and to help maintain the price level particularly in respect of mass consumption goods. Further, the scope of the Open General Licence (OGL) has also been widened by placing a number of essential commodities like leather machinery, garment making machinery, a large number of drugs, medicines, chemicals, electronic items, iron and steel items, and scientific and technical books under OGL. The system of automatic licensing has also been introduced whereby licences are issued on the basis of actual consumption of imported raw materials without reference to the value of such licences in the previous year. But certain items categorised as ‘absolutely non-permissible” are not allowed to be imported in view of their indigenous availability. Thus the main aim of the import-control policy in India has been to achieve faster economic development by providing essential imported inputs for enlarging the production base for exports.

5. Export Controls. Control over the export of various products in underdeveloped countries depends upon internal supply conditions, variations in the demand for products internally and internationally and the need for conserving stocks of essential raw materials. However, the principal objectives of exchange controls in such countries are: (a) to earn large foreign exchange from exports; (b) to conserve sufficient quantities of products for domestic consumption; (c) to enforce standards of quality and grading; (d) to fulful commitments under international allocations; and (e) to fulfil export commitments in accordance with trade agreements; and (f); to increase exports to hard currency areas.

Control over exports in India aim at achieving all these objectives. Upto 1957-58 Indian exports were almost stagnant. In that year export duties were adjusted downward to earn large foreign exchange. Arrangements were also made to introduce quality control and grading. Exports again received a setback in 1965-66. After the devaluation of the Rupee in June 1966, export duties were levied on a number of traditional export items which faced either inelastic foreign demand or lack of elasticity of supply or both. The main purpose behind the levy of export duties was to avoid loss of foreign exchange through a fall in the foreign prices. However, reductions, rationalisations or abolition of export duties are made from time to time in the light of international demand conditions and the competitive position of Indian export products in the world market. In India, two-thirds of exports are subject to controls. Keeping in view the trend in domestic availability of commodities and prices, some items are banned and others are regulated for export purposes every year. Many of the items are also placed under the OGL.

6. Exchange Control. Exchange control is a method by which efforts are made to influence the balance of payments directly. Underdeveloped countries suffer from balance of payments difficulties. Their export earnings are low as they mainly export raw materials and other cheap products which are subject to international price fluctuations and hence variations in demand. On the other hand, they import heavy capital equipment, machinery and a number of manufactured articles so that they are required to make large payments to foreign countries. This necessitates the imposition of direct control on payments to other countries. In its most comprehensive form, exchange control requires exporters to deposit all their foreign exchange with the exchange control authorities in exchange for domestic currency. In a system of exchange control foreign exchange is not fully convertible. Importers and other persons needing foreign currencies are not given freely. They are required to satisfy certain conditions laid down by the authorities to obtain foreign exchange for making payments to foreigners. Even restrictions are placed on foreign travels and education. Exchange controls are used also to discriminate against imports from certain countries. It leads to rationing of a scarce currency to reduce imports from that country while people are left free to buy from those countries whose currencies are plentiful. Another form of exchange control is the system of multiple exchange rates. The exchange control authorities may prescribe two or more exchange rates for different kinds of international

transactions. Normal exchange rate may be used for essential imports and penalty exchange rate for non-essential imports.

In India the system of exchange control exists in its exhaustive form in order to control exports and imports in the context of a developing economy. Exchange controls were introduced in India during the Second World War to conserve foreign exchange. An Exchange Control Department was opened by the Reserve Bank of India in 1939 for this purpose. Thus the Reserve Bank of India is the exchange control authority in the country. All export earnings are required to be deposited with the Reserve Bank of India or its authorised dealers, and they are exchanged for the Indian Rupee at a fixed rate. All importers are required to seek permission of the authorities for importing commodities, then only foreign exchange is released by the Reserve Bank. Similarly, any person desirous of going abroad for purposes of business, higher education, etc., is released only a limited amount of foreign exchange for a specified period of time.

LIMITATIONS OF PHYSICAL CONTROLS

Physical controls, as discussed above, are not so successful in matching the demand and supplies of commodities and services in a country like India. They have their difficulties which prevent them from controlling inflationary and balance of payments pressures and in allocating goods and services equitably. They, therefore, bring in a certain amount of black marketing, corruption.

Control over consumption in the form of price controls and rationing is successful in countries where administration is efficient. Controls require the fixation of prices of various goods not only at different stages of production but also at different places. Controls cannot be rigid. They have to be reviewed and relaxed when the supply situation improves. Controls also necessitate complete co-ordination between the Centre and the States. The failure on the part of the Government of India after Independence to follow such measures due to an inefficient administrative machinery led to corruption and black marketing. However, in recent years the Government have learnt much from past experiences and have tried to rationalize the system of controls. But still certain snags are visible in the policy of price controls.

In *India* controls exist in the case of essential consumer goods like wheat, rice,

vegetable ghee, sugar, etc. When prices of controlled commodities are fixed upward, prices of uncontrolled and related goods also rise but more in proportion to the rise in the former. No efforts are made to control the prices of the latter goods like pulses, oils, confectionary, etc. Moreover, prices of other consumer goods such as milk, tea, coffee, etc., also tend to rise since they happen to be uncontrolled articles. Thus partial controls have been ineffective in controlling inflationary pressures in India. They, therefore, need to be supplemented by fiscal and monetary measures.

Certain problems also arise in the case of those commodities which are rationed alongwith controls. To avoid black marketing and corruption, the quantity of ration allotted should be high enough to meet the minimum requirements of a family. In India the rationed articles of various qualities are sold to consumers in fixed quantities according to the number of family members. This results in a large unsold surplus of the superior quality and shortage of the inferior quality in predominantly labour areas in the case of wheat and rice, whereas the opposite happens in areas resided by the white collar classes. The Government's policy of selling the same commodity in the open market, as also through fair price shops at controlled prices, creates difficulties when consumers do not draw full ration allotted to them. It encourages ration shops to sell surplus quantities in the black market at higher prices. Moreover, the supply of essential articles at controlled prices and in fixed quantities have tended to increase the demand for uncontrolled semi-luxury and luxury goods with increase in the savings of the people. This has resulted in diverting resources from essential to non-essential articles of consumption.

1. In the Field of Production. India has the most comprehensive system of physical controls in the form of licences, quotas, authorisation, etc. There is such a maze of regulations and elaborate procedures that there is inordinate delay in taking decisions on the part of government departments. For instance, to start a firm, a licence is required which is not an easy affair. The location of the factory, the product to be manufactured, and the amount of capital to be raised must be got approved from the respective government departments. The policy of investment controls has led to corruption and arbitrary decision. It has not helped in removing regional imbalances, preventing concentration and allocating resources equitably. Thus controls have tended to retard progress by

eliminating healthy competition and preventing the operation of the price factor. Moreover, these controls have tended to hurt the small businessmen the most because they cannot meet the requirements of a rigid system of licensing. The Planning Commission admits in this connection that "the existing industrial structure had led generally to a high level of costs and that the present system does not appear to have prevented concentration. In some cases industry has been inappropriately sited and some desirable adjustments in regional locations have not taken place. ... Sheltered conditions created, in part, by the operation of existing controls appear to have reduced cost consciousness among entrepreneurs." It, therefore, proposes a relaxation of existing controls so as to encourage fully responsible decision making on the part of entrepreneurs and an element of competitiveness in the economy which would keep up cost consciousness.[2] Prof. W.A. Lewis observes that the system of licensing was thought to be an inevitable instrument of planned development for a few years after the Second World War, but this was only a passing phase. By the middle of 1950s all the leading social democratic parties of the world had come to realize that licensing was an inefficient and corrupt way of allocating resources and had dropped it from their programmes. Today even in the USSR, powerful authoritative voice, are urging greater reliance on the market and less use of administrative directions. He, therefore, opines that, "if licensing is inefficient and corrupt in advanced countries, with first class administrators, it is even more harmful in less developed countries. In most poor countries licensing means inordinate delays and inexplicable decisions. If licensing cannot be administered promptly and efficiently, the country is better off without it."[3]

2. In the Field of Imports. The policy of import controls through import quotas and import licensing also widens the scope for delay, corruption and arbitrary decisions. Often priority industries are not able to import intermediate inputs in time, due to delay in sanctioning quotas and licences. In certain cases, inadequate quotas are fixed in relation to demand.

3. In the Field of Export. The policy of export controls has been a success in achieving its main objectives of earning larger foreign exchange and thus minimising the balance of payments deficit.

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2. GOI, *Fourth Five-Year Plan*, 1969-74.

3. W.A. Lewis, *Development Planning*, 1966

4. In the Field of Exchange Controls. Exchange controls are very rigid in India. They leave no freedom to private enterprise to buy plant, machinery, raw materials from the country of its choice. They can be only imported from that country whose currency is available with the Reserve Bank of India. The exchange control policy of India has created a black market not only of dollar but also of sterling. Further it has tended to breed corruption. Recent exchange control relaxations have been too small to warrant any improvement in the situation. We may quote Prof. Lewis in this connection: "Some countries have had exchange control for so long that they have persuaded themselves that it is an inevitable accompaniment of economic development. This is not so, most countries have developed without exchange control; it is rather a sign of failure to allocate sufficient resources for the maintenance of the foreign balance, whether by paying more attention to exports or by investing more in import substitution. Countries which make adequate plans for exportation and import substitution do not need exchange control (apart from restrictions on exporting capital)."[4]

Conclusion. Despite these weaknesses, direct controls have helped in allocating scarce resources to a considerable extent in India. The main problem has been not one of their success but of their extension and rigid application to almost every sphere of economic activity. The Indian economy is said to suffer from the crisis of controls. No doubt, controls are essential in a planned economy but in India they have been carried so far as to hinder planned progress. The success of the policy of physical controls for economic development depends upon a judicious combination of the various control measures alongwith monetary and fiscal measures. As soon as they fulfil the task of allocating scarce resources and removing scarcities physical controls should be relaxed.

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4. *Ibid.*

CHAPTER

Input-Output Analysis

MEANING

Input-output is a novel technique invented by Prof. Wassily W. Leontief in 1951. It is used to analyse inter-industry relationship in order to understand the inter-dependencies and complexities of the economy and thus the conditions for maintaining equilibrium between supply and demand. It is also known as "inter-industry analysis."

Before analysing the input-output method, let us understand the meaning of the terms, "input" and "output". According to Prof. J.R. Hicks, an input is "something which is bought for the enterprise" while an output is "something which is sold by it." An input is obtained but an output is produced. Thus input represents the expenditure of the firm, and output its receipts. The sum of the money values of inputs is the total cost of a firm and the sum of the money values of the output is its total revenue.

The input-output analysis tells us that there are industrial interrelationships and inter-dependencies in the economic system as a whole. The inputs of one industry are the outputs of another industry and vice versa, so that ultimately their mutual relationships lead to equilibrium between supply and demand in the economy as a whole. Coal is an input for steel industry and steel is an input for coal industry, though both are the outputs of their respective industries. A major part of economic activity consists in producing intermediate goods (inputs) for further use in producing final goods (outputs). There are flows of goods in "whirlpools and cross currents" between different industries. The supply side consists of large inter-industry flows of intermediate products and the demand side of the final goods. In essence, the input-output analysis implies that in equilibrium, the money value of aggregate output of the whole economy must equal the sum of the money values of inter-industry inputs and the sum of the money values of inter-industry outputs.

Main Features. The input-output analysis is the finest variant of general equilibrium. As such, it has three main elements:

First, the input-ouput analysis concentrates on an economy which is in equilibrium. It is not applicable to partial equilibrium analysis.

Secondly, it does not concern itself with the demand analysis. It deals exclusively with technical problems of production.

Lastly, it is based on empirical investigation.

Assumptions. This analysis is based on the following assumptions:

(i) The whole economy is divided into two sectors—''inter-industry sector" and "final demand sector," both being capable of sub-sectoral division.

(ii) The total output of any inter-industry sector is generally capable of being used as inputs by other inter-industry sectors, by itself and by final demand sectors.

(iii) No two products are produced jointly. Each industry produces only one homogeneous product.

(iv) Prices, consumer demands and factor supplies are given.

(v) There are constant returns to scale.

(vi) There are no external economies and diseconomies of production.

(vii)The combinations of inputs are employed in rigidly fixed proportions. The inputs remain in constant proportion to the level of output. It implies that there is no substitution between different materials and no technological progress. There are fixed input coefficients of production.

The input-output analysis consists of two parts: the construction of the input-output table and the use of input-output model.

USE OF INPUT-OUTPUT MODEL IN PLANNING

The input-output table relates to the economy as a whole in a particular year. It shows the value of the flow of goods and services between different productive sectors especially inter-industry flows.

For understanding, a three-sector economy is taken in which there are two inter-industry sectors, agriculture and industry, and one final demand sector.

Table 1 provides a simplified picture of such economy.

In this table, the total output of the industrial, agricultural and household sectors is set in rows (to be read horizontally) and has been divided into the agricultural, industrial and final demand sectors. The inputs of these sectors are set in columns. The first row total shows that altogether the agricultural output is vauled at Rs. 300 crores per year. Of this total, Rs 100 crores go directly to final consumption, that is, household and government, as shown in the third column of the first row**.** The remaining output from agriculture goes as inputs; 50 to itself and 150 to industry. Similarly, the second row shows the distribution of total output of the industrial sector valued at Rs. 500 crores per year.

Table 1. Input-Output Table

(in Value Terms : Rs. Crores)

		PURCHASING SECTORS			
Sectors		1 Inputs to Agriculture	2 Inputs to Industry	3 Final Demand	4 Total Output or Total Revenue
SELLING SECTORS	Agriculture	50	150	100	300
	Industry	100	250	150	500
	Value added*	150	100	—	250
	Total Input or Total cost	300	500	250	1050

* Value added refers to payments to the factors of production.

Columns 1, 2 and 3 show that 100 units of manufactured goods go as inputs to agriculture, 250 to industry itself and 150 for final consumption to the household sector.

Let us take the columns (to be read downwards). The first column describes the

input or cost structure of agricultural industry. Agricultural output valued at Rs .300 crores is produced with the use of agricultural goods worth Rs. 50, manufactured goods worth Rs. 100 and labour or/and management services valued at Rs. 150. To put it differently, it costs Rs. 300 crores to get a revenue of Rs. 300 crores from the agricultural sector, Similarly, the second column explains the input structure of the industrial sector (*i.e.*, 150+250+100=500). Thus "a column gives one point on the production function of the corresponding industry." The 'final demand' column shows what is available for consumption and government expenditure. The third row corresponding to this column has been shown as zero. This means that the household sector is simply a spending (consuming) sector that does not sell anything to itself. In other words, labour is not directly consumed.

FEASIBILITY AND CONSISTENCY OF THE PLAN

An economy behaves and assumes a certain pattern of flows of resources in two ways. They are: (a) the internal consistency or balance of each sector of the economy, and (b) the external stability of each sector or inter-sectoral relationships. Leontief calls them the "fundamental relationship of balance and structure." When expressed mathematically they are known as the "balance equations" and the "structural equations."

If the total output of say X_i of the *i*th industry be divided into various number of industries, 1, 2, 3, *n*, then we have the balance equation:

$$X_i = x_{i1} + x_{i2} + x_{i3} + \ldots\ldots x_{in} + D_i \qquad \ldots(1)$$

and if the amount say *Yi* absorbed by the "outside sector" is also taken into consideration, then the balance equation of the *i*th industry becomes

$$X_i = x_{i1} + x_{i2} + x_{i3} + \ldots\ldots x_{in} + D_i + Y_i$$

or

$$\sum_{j=1}^{n} xij + Y_i = X_i \qquad \ldots(2)$$

It is to be noted that Y_i stands for the sum of the flows of the products of the *i*th industry, to consumption, investment and exports, net of imports, etc. It is also called the "final bill of goods" which it is the function of the output to fill. The balance equation shows the conditions of equilibrium between demand and

supply. It shows the flow of outputs and inputs to and from one industry to other industries and vice versa.

The system of balance equations in the analysis presents the conditions of internal consistency of the plan. The plan would not be feasible without them because if these equations are not satisfied, there might be excess of some goods and deficiency of others.

Since x_{i2} stands for the amount absorbed by industry 2 of the *i*th industry it follows that *xij* stands for the amount absorbed by the *j*th industry of *i*th industry. The "technical coefficient" or "input coefficient" of the *i*th industry is denoted by:

$$aij = \frac{xij}{Xj} \qquad \ldots(3)$$

where, *xij* is the flow from industry *i* to industry *j*, *Xj* is the total output of industry *j* and *aij*, as already noted above, is a constant, called "technical coefficient" or "flow coefficient" in the *i*th industry. The technical coefficient shows the number of units of one industry's output that are required to produce one unit of another industry's output. Equation (3) is called a "structural equation." The structural equation tells us that the output of one industry is absorbed by all industries so that the flow-structure of the entire economy is revealed. A number of structural equations give a summary description of the economy's existing technological conditions.

The matrix of technical coefficient of production for any input-output table with *n* sectors would consist of *n* x *n* elements. There being two sectors in our example, 2 x 2 technical coefficients of the matrix would be arranged symbolically as follows:

Table 2: Technology Matrix A

	Agriculture	*Industry*
Agriculture	a_{11}	a_{12}
Industry	a_{21}	a_{22}

Using equation (3) to calculate the *aij* for our example of the two-sector input-

output Table 1, we get the following technology matrix:

Table 3: Technology Coefficient Matrix A

	Agriculture	*Industry*
Agriculture	$\frac{50}{300} = .17$	$\frac{150}{500} = .30$
Industry	$\frac{100}{300} = .33$	$\frac{250}{500} = .50$

* For a Consistency Plan Model, refer to the Fourth Plan Model in Ch. 36.

These input coefficients have been arrived at by dividing each item in the first column of Table1 by first row total, and each item in the second column by the second row, and so on. Each column of the technological matrix reveals how much agricultural and industrial sectors require from each other to produce a rupee's worth of output. The first column shows that a rupee's worth of agricultural output requires inputs worth 33 paise from industries and worth 17 paise from agriculture itself.

THE LEONTIEF SOLUTION*

The table can be utilised to measure the direct and indirect effects on the entire economy of any sectoral change in total output of final demand.

Again using equation (3)

$$aij = \frac{xij}{X_i}$$

Cross multiplying. $xij = aij.\ X_j$

By substituting the value of *xij* into equation (2) and transposing terms, we obtain the basic input-output system of equations

$$X_i - \sum_{i=1}^{n} aij\ xj = Y_i$$

In terms of our two-sector economy, there would be two linear equations that

could be written symbolically as follows:

$$x_1 - a_{11}x_1 - a_{12}x_2 = Y_1$$

$$x_2 - a_{21}x_1 - a_{22}x_2 = Y_2$$

The above symbolic relationship can be shown in matrix form:

$$X - [A]\,X = Y$$

$$X\,[I - A] = Y$$

where matrix $(I–A)$ is known as the Leontief Matrix

$$(I–A)^{-1}\,(I–A)\,X = (I–A)^{-1}\,Y$$
$$X = (I–A)^{-1}\,Y \qquad [\because (I–A)^{-1}\,(I–A)]$$

and I, the identity matrix = $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Hence $\begin{bmatrix} X_1 \\ X_2 \end{bmatrix} = \left\{\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - [A]\right\}^{-1} \begin{bmatrix} Y_1 \\ Y_2 \end{bmatrix}$

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* Ordinary students may omit this portion.

Numerical Solution. Our technology matrix as per Table 3 is

$$A = \begin{bmatrix} .1 & .3 \\ .3 & .5 \end{bmatrix} \text{ and } Y = \begin{bmatrix} 100 \\ 150 \end{bmatrix}$$

$$(I - A) = \begin{bmatrix} .9 & -.3 \\ -.3 & .5 \end{bmatrix}$$

$$\text{The value of inverse} = \frac{\text{Adjoint}}{\text{Determinant}} = \frac{Adj}{|A|}$$

$$[Aij] = \begin{bmatrix} .5 & .3 \\ .3 & .9 \end{bmatrix}$$

$$\text{By transposing, } Aij = \begin{bmatrix} .5 & .3 \\ .3 & .9 \end{bmatrix}$$

The value of determinant = .9(.5) – (–.3)(–.3)

$$= .45 - .09 = .36$$

Hence $\begin{bmatrix} X_1 \\ X_2 \end{bmatrix} \frac{1}{=.36} \begin{bmatrix} .5 & .3 \\ .3 & .9 \end{bmatrix} \begin{bmatrix} 100 \\ 150 \end{bmatrix}$

The total output of agriculture sector (x_1)

$$= \frac{.5 \times 100 + .3 \times 150}{.36} = 264$$

The total output of industrial sector (x_2)

$$= \frac{.3 \times 100 + .9 \times 150}{.36} = 458$$

THE DYNAMIC INPUT-OUTPUT MODEL

So far we have studied an open static model. "The model becomes Dynamic when it is closed by the linking of the investment part of the final bill of goods to output."[1] The dynamic input-output model extends the concept of inter-sectoral balancing at a given point of time to that of inter-sectoral balancing over time. This necessarily involves the concept of durable capital.[2]

The Leontief dynamic input-output model is a generalization of the static model and is based on the same assumptions. In a dynamic model, the output of a given period is supposed to go into stocks, *i.e.*, capital goods, and the stocks, in turn, are distributed among industries. The balance equation is:

$$X_i(t) = x_{i1}(t) + x_{i2}(t) x_{i3}(t) \ldots + x_{in}(t) + (S'_{i1} + S'_{i2} + S'_{i3} + \ldots S'_{in}) + D_i(t) + Y_i(t) \qquad \ldots.(4)$$

Here $X_i(t)$ represents the total flow of output of *i*th industry in period *t*, which is used for three purposes:

(*i*) for production in the economy's *n*. industries $x_{i1}(t)$, $x_{i2}(t)$, etc., in that period;

(*ii*) as net addition to the stock of capital goods in *n* industries *i.e.*, S'_t which can also be written as $\Delta S_i(t) = S_i(f+1) - S_i(t)$, where $S_i(t)$ indicates the

accumulated stock of capital in the current period (t), and $S_i(t+1)$ is next year's stock; and

(iii) as consumption demand for the next period $D_i(t+1)$.

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1. J. Sandee, *A Demonstration Planning Model for India*.

2. Ajit K. Dasgupta, *op. cit.*, p. 75.

If we ignore depreciation and wear-tear, then $S_i(t+1)–S_i(t)$ is the net addition to capital stock out of current production. Equation (4) can, therefore, be written as:

$$X_i(t) = x_{i1}+x_{i2}+x_{i3}+\ldots x_{in}+S_i\,(t+1)–S_i(t) + D_i(t)+Y_i(t)$$

$Y_i(t)$ stands for the amount absorbed by the outside sector in period t.

Just as the technical co-efficient was derived in the case of the static model the capital co-efficient can be found out in a similar manner. Capital co-efficient of the ith product used by the jth industry is denoted by

$$bij = \frac{Sij}{Xj}$$

Cross multiplying we have $Sij=bij.xj$ ... (5)

where, *Sij* represents the amount of capital stock of the *j*th product used by the *j*th industry. *Xj* is total output of industry *j* and *bij* is a constant called *capital co-efficient* or *stock co-efficient*. Equation (5) is known as the structural equation in a dynamic model.

If the *bij* co-efficient is zero, it means that no stock is required by an industry and the dynamic model becomes a static model. Moreover, *bij* can neither be negative nor infinite. If the capital co-efficient is negative, the input is in fact an output of an industry.

LIMITATIONS OF INPUT-OUTPUT ANALYSIS

The input-output analysis has its shortcomings.

Its framework rests on Leontief's basic assumption of constancy of input co-efficient of production which was split up above as constant returns to scale and technique of production. The assumption of constant returns to scale holds good in a stationary economy, while that of constant technique of production in stationary technology. These assumptions sacrifice reality. They do not treat the inter-industry analysis dynamically even in the so called "dynamic model". It tells us nothing as to how technical co-efficients would change with changed conditions. Again, some industries may have identical capital structures, some may have heavy capital requirements while others may use no capital. Such variations in the use of techniques of production make the assumption of constant co-efficients of production unrealistic.

Again, this assumption of fixed co-efficients of production ignores the possibility of factor substitution. There is always the possibility of some substitutions even in a short period, while substitution possibilities are likely to be relatively greater over a longer period.

The assumption of linear equations, which relates outputs of one industry to inputs of others, appears to be unrealistic. Since factors are mostly indivisible, increase in outputs do not always require proportionate increase in inputs.

Moreover, the rigidity of the input-output model cannot reflect such phenomena as bottlenecks, increasing costs, etc.

The input-output model is severely simplified and restricted as it lays exclusive emphasis on the production side of the economy. It does not **tell** us why the inputs and outputs are of a particular pattern in the economy.

Another difficulty arises in the case of "final demand" or "bill of goods." In this model, the purchases by the government and consumers are taken as given and treated as a specific bill of goods. Final demand is regarded as an independent variable. It might, therefore, fail to utilize all the factors proportionately or need more than their available supply. Assuming constancy of co-effciency of production, the analysis is not in a position to solve this difficulty.

There is no mechanism for price adjustment in the input-output analysis which makes it unrealistic. "The analysis of cost-price relations proceeds on the

assumption that each industrial sector adjusts the price of its output by just enough to cover the change in the case of its primary and intermediate output." The dynamic input-output analysis involves certain conceptual difficulties.

First, the use of capital in production necessarily leads to stream of output at different points of time being jointly produced. But the input-output analysis rules out joint production. *Second*, itcannot be taken for investment and output will necessarily be non-negative."[3]

The input-output model thrives on equations that cannot be easily arrived at. The first thing is to ascertain the pattern of equations, then to find out the necessary voluminous data. Equations pre-suppose the knowledge of higher mathematics and correct data are not so easy to assertain. This makes the input-output model abstract and difficult. In the above analysis, we have presented a highly simplified model of input-output analysis. To be useful for planning purposes, the input-output table should be divided into thirty or more industries or sectors. In many underdeveloped countries reliable data needed to construct a large input-output table are not easily available. In smaller countries only a few industries or sectors exist and the input-output table is of little use. A number of cells in it are shown as zero. Moreover, in case of the subsistence agricultural sector, labour is the only input, and output sold in the market sector is insignificant, while commercial crops are sold to the consumption sector. The input-output table is useless in such economies. Thus for the input-output analysis to be useful for an underdeveloped country, it is essential that it must be a large economy where the number of industries or sectors is quite large for substantial inter-industry transactions to take place and for reliable statistical information to be available. But all these conditions are not met in the majority of underdeveloped countries which limit the use of input-output analysis as a technique in development planning.

USE OF INPUT-OUTPUT TECHNIQUE IN PLANNING

The knowledge of both the fundamental relationships of "flow coefficients" of the static model and of "capital coefficients" of the dynamic model is required for the development plans. The input-output table tells us about the inter-relationships between various sectors and the structural relationships within each sector. On the basis of this information, the planning authority can

determine the effect of a change in one sector on all other sectors of the economy and thus plan accordingly.

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3. *Ibid* . p. 76.

With the help of the static analysis “flow coefficients” of each industry can be calculated and known during a given period of time. But in an economy fast moving towards economic development, the flow structure of the economy does not remain stable. Again, a static model takes the capital structure of the economy as given. In fact, the capital requirements of the economy change with economic development. It is only “when we properly harmonize the capital structure with the flow structure that we get a comprehensive input-output system which is very useful for dynamic analysis in connection with planning. Given the basic conditions and also time period (say five years) one can calculate the flow coefficients and the capital coefficients of an economy. In addition to all this if the time shape of the final demand is also known, one could find out definitely (by solving a system of linear non-homogenous differential equations) what should be the consistent and optimum levels of output of various industries after five years.”4

The input-output technique with it’s basic assumption of constant “technical coefficient” is of much help to a planning authority in an underdeveloped country. A linear homogeneous input-output model fits in an underdeveloped economy where reliable statistical data about technical coefficients are not easily available. By assuming constant “flow” and “capital coefficients” the need for collecting and computing vast statistical data is greatly reduced. Since inputs are considered proportional to outputs, this technique is certainly of immense help in determining the amount of inter-industry flows of goods and services in an underdeveloped country.

“From the planning point of view, the dynamic input-output model has much appeal; it helps in identifying a moving equilibrium of outputs. Investment is specified of a disaggregated level in terms of specific investment goods and is treated endogenously. The planner is helped to see more clearly the implications of raising the level of investment in a particular sector’, given the requirements of inter-sectoral balancing.”5

The input-output analysis is also used for national economic planning. The static and dynamic models can be applied in preparing the Plan-frame' in underdeveloped economies. The input-output model provides the necessary information about the structural coefficients of the various sectors of the economy during a period of time or at a point of time which can be utilized for the optimum allocation of the economy's resources towards a desired end. The dynamic model is particularly helpful in a developing economy which can estimate through the input-output table the impact of different growth rates of the various sectors of the economy and thus choose the most desired one.

A United Nations study[6] lists the following uses of input-output models in development programming:

"(*i*) They provide for individual branches of the economy's estimates of production and import levels that are consistent with each other and with the estimates of final demand.

"(*ii*) The solution to the model aids in the allocation of the investment required to achieve the production levels in the programme and it provides a more accurate test of the adequacy of available investment resources.

"(*iii*) The requirements for skilled labour can be evaluated in the same way.

"(*iv*) The analysis of import requirements and substitution possibilities is facilitated by the knowledge of the use of domestic and imported materials in different branches of the economy.

"(*v*) In addition to direct requirements of capital, labour and imports, the indirect requirements in other sectors of the economy can also be estimated.

"(*vi*) Regional input-output" models can also be constructed for planning purposes to explore the implications of development programmes for the particular region concerned, as well as for the economy as a whole."

It concludes that these models "are primarily applicable in economies that have achieved a certain degree of industrial development and hence have a substantial volume of inter-industry transactions."

4. A. Ghosh, *New Horizons in Planning*, p. 16.

5. Ajit K. Dasgupta. *op.cit*., p. 75.

6. Use of Model in programming, UN Department of Economics & Social Affairs, Industrialization and Productivity.

CHAPTER

Linear Programming

Linear Programming is a mathematical device developed by mathematician **George Dantzig** in 1947 for planning the diversified activities of the US Air Force connected with the problem of supplies to the forces. Linear or mathematical programming, also known as activity analysis, has been further developed in its application to the economic theory of the firm, managerial economics and finally to development planning.

MEANING

It is a mathematical technique for the analysis of optimum decisions, subject to certain constraints in the form of linear inequalities. Mathematically speaking, it applies to those problems which require the solution of maximisation or minimisation subject to a system of linear inequalities stated in terms of certain variables. The problems of maximisation and minimisation are also called optimisation problems. When cost and price per unit change with the size of output, the problem is non-linear and if they do not change with output, the problem is linear. Linear programming may thus be defined as a method to decide the optimum combination of factors to produce a given output or the optimum combination of products to be produced by given plan and equipment. It is also used to decide between a variety of techniques to produce

a commodity. The technique involved in linear programming is similar to the one adopted in input-output analysis for the industry.

CONDITIONS AND GENERALISATIONS

The application of linear programming (LP) technique to any problem rests on certain conditions and generalisations:

First, there is a definite *objective*. It may be the maximisation of profits or national income or employment or the minimisation of costs. It is known as the *objective function* or the criterion function. If a quantity is maximised, its negative quantity is minimised. Every maximisation problem has its dual problem, that of minimisation. The original problem is the primal problem which always has its dual. If the primal problem pertain to maximisation, the dual involves minimisation and *vice versa*.

Secondly, there should be alternative production processes for achieving the objective. The concept of process or activity is the most important in linear programming. A process is a 'specific method of performing an economic task'. It is 'some physical operation, *e.g*., consuming something, storing something, selling something, throwing something away, as well as manufacturing something in a particular manner. The LP technique enables the planning authority to choose the most efficient and economical process in attaining the objective.

Thirdly, there must be certain constraints or restraints of the problem. They are the limitations or restrictions pertaining to certain, conditions of the problem, as to what cannot be done and what has to be done. They are also known as inequalities. They may be limitations of resources such as land, labour or capital.

Fourthly, there are the choice variables, the various production processes or activities so as to maximise or minimise the objective function and to satisfy all the restraints.

Lastly, there are the feasible and optimal solutions. Given the income of the consumer and the prices of goods, feasible solutions are all p6ssible combinations of the goods he can feasibly buy. Feasible solutions of two

goods for the consumer are all combinations that lie on and to the left of the budget line. Whereas, on an isocost line, they are the combinations that lie on and to the right of it. We may put it differently that a feasible solution is one which satisfies all the restraints. The optimal solution is the best of the feasible solutions. If a feasible solution maximises or minimises the objective function, it is an optimal solution. The best available procedure for finding out the optimal solution out of the possible feasible solutions is the simplex method. It is a highly mathematical and technical method involved in linear programming. However, the main aim of linear programming is to find out optimal solutions and study their characteristics.

ASSUMPTIONS

The linear programming analysis is based upon the following assumptions:

(*i*) The decision-making body is faced with certain constraints or resource restrictions. They may be credit, raw material and space constraints on its activities. The type of constraints in fact depend upon the nature of problem. Mostly, they are fixed factors in the production process.

(*ii*) It assumes a limited number of alternative production processes.

(*iii*) It assumes linear relations among the different variables which implies constant proportionality between inputs and outputs within a process. .

(*iv*) Input-output prices and coefficients are given and constant. They are known with certainty.

(*v*) The assumption of additivity also underlies linear programming techniques which means that the total resources used by all firm's must equal the sum of resources used by each individual firm.

(*vi*) The LP technique assumes continuity and divisibility in products and factors.

(*vii*) Institutional factors are also assumed to be constant.

Lastly, for programming a certain period is assumed, For convenience and

more accurate results, the period is generally short, though longer periods are not ruled out.

PROGRAMMING TECHNIQUE—ITS APPLICATION IN PLANNING

In plan formulation, the planners have to decide whether to use labour-intensive or capital-intensive technique of production, depending on its outlay. They will choose that technique which maximises output.

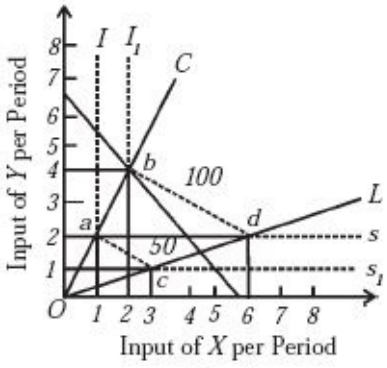

Fig. 1

Let us suppose that it is planned to produce a commodity *Z*. Using *X* and *Y* inputs, its objective is to maximize output. It has two alternative production processes, *C* (capital-intensive) and *L*(labour-intensive). The constraint is a given cost outlay MP as shown in the figure. All other assumptions given above are applicable. The problem is explained in terms of Fig. 1.

Units of input *Y*per period are measured along the vertical axis and units of input *X*per period are shown on the horizontal axis. If process *C*requires two units of input *Y*to every unit of input *X*, it will produce 50 units of commodity *Z*. If the inputs of *X*and *Y* are doubled to four units of *Y* and two units of *X* output is also doubled to 100 units of *Z*. These combinations of *X* and *Y*, represented by *a* and *b*, establish the output scale along the capital-intensive process ray *OC*. On the other hand, the same units (50) of good *Z* can be produced by process *L* by combining three units of *X* with one unit of *Y*. And 100 units of *Z* can be produced by doubling the inputs *X*and *Y* to six units of *X* and two units of *Y*. These output scales are established along the labour-intensive process *OL*, as represented by input combinations *c* and *d*. If the points *a* and *c* at the 50 units output level on the linear rays *OC* and *OL* are joined, they form an isoquant (shown, dotted) *Iasc* $_1$. At the 100 units output level, the corresponding isoquant is I_1bds. The cost-outlay constraint is represented by the isocost curve *MP* and it places a limit on the production capacity of the project. The project can produce with either of the two available techniques *C* and *L* within the area represented by the triangle *Obd*.

It is not possible for it to produce outside this "area of feasible solutions." The "optimal solution" which maximises the output will occur at the point where the isocost curve touches the isoquant with the highest output. In Fig. 1 the isocost curve *MP* touches the isoquant *I* $_1$*bds* at point *b* on the process ray *OC*. It shows that the project will use the capital-intensive technique *C* by using four units of input *Y* and two units of input *X* and produce 100 units of commodity *Z*.

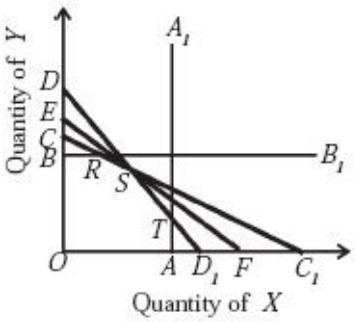

Fig. 2

Take another project whose objective function is to maximise its revenue subject to certain constraints of limited capacities. Suppose it produces two products, *X* and *Y*. It has four departments each with a fixed capacity. Let these departments relate to manufacturing, assembling, polishing and packing the product which be designated as *A*, *B*, *C* and *D*. The problem is illustrated graphically in Fig.2.

The production of *X* and *Y* is subject to constraints *A*, *B*, *C* and *D*. Constraint *A* limits the production of *X* to *OA*. Constraint *B* limits the production of *Y* to *OB*. Constraint *C* limits the production of both *X* and *Y* to *OC*$_1$, and *OC* respectively, while constraint *D* limits their production to *OD*; and *OD*. The area *OATSRB* shows all combinations of *X* and *Y* that can be produced without violating any constraints. This is the area of feasible production within which *X* and *Y* can be produced, but there is no possibility of producing any combination at any point outside this area.

The original solution can be found out by taking an isoprofit line within the feasibility zone. An isoprofit line represents all combinations of *X* and *Y* which yield the same profit to the firm. The optimal solution lies on the highest isoprofit line *EF* in the polygon *OATSRB*. This is point *S*. Any point other than *S* lies outside the zone of feasible production.

Every linear programming maximisation problem has its dual problem, that of minimisation. The original problem is known as the *primal* problem, which always has its dual. If the primal problem pertains to maximisation, the dual involves minimisation, and *vice versa*.

Now we take another planning problem. Suppose the planners undertake a project which aims at minimisation of *costs*. Two types of goods X_1 and X_2 are to be produced. Let the planners attach weights of 3 and 8 to units of these goods. Let there be 2 units of resource X_1 and 6 units of resource X_2. Let the production of 1 unit of X_1 use 1 unit of input C_1 and 2 units of input C_2. Similarly, let the production of X_2 use 2 units of C_1 and 8 units of C_2. The problem can now be set in the linear programming form as:

Maximise $3X_1 + 8X_2$ (*R, i.e.*, revenue)

Subject to the constraints

$$X_1 + 2X_2 \leq 2$$

and

$$2X_1 + 8X_2 \quad 6$$

and none of these quantities is negative. The optimal solution is $X_1=2, X_2 = 1/2$ and $R = 7$.

The *dual problem* is:

Let P_1 be the imputed price of X_1 and P_2 be the imputed price of X_2 , Minimise $2P_1 + 6P_2$

(*C, i.e.*, cost)

Subject to the constraints

$$P_1 + 2P_2 \quad 3$$

and

$$2P_1 + 8P_2 \quad 8$$

and that none of these prices is negative. The optimal solution is:

$$P_1 = 1_1\ P_2 = 1/2 \text{ and } C=7.$$

These are the shadow or dual prices. But as all values have been imputed to the two resources, the maximum value of the objective function *C* must equal *R*. Hence $C=R=7$.

Graphically line *AB* represents $P_1+2P_2=3$ and line *CD* represents $2P_1+8P_2=8$. The feasible solutions lie on or above the thick line *AZD*in fig. 3. The optimal solution is at point *Z* where the isocost (dotted line) *RK* passes through the point of intersection of *AB* and *CD.*

LIMITATIONS OF LINEAR PROGRAMMING

Linear programming has turned out to be a highly useful tool of analysis in development planning. But it has its limitations. As a matter of fact, actual planning problems cannot be solved directly by the *LP* technique due to a number of restraints.

First, it is not easy to define a specific objective function.

Second, even if a specific objective function is laid down, it may not be so easy to find out the various social institutional, financial, and other constraints which may be operative in pursuing the given objective.

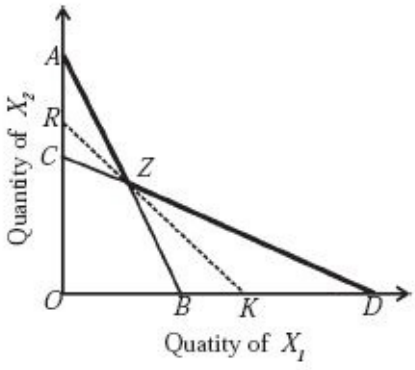

Fig. 3

Third, given a specific objective and a set of constraints, it is possible that the constraints may not be directly expressible as linear inequalities.

Fourth, even if the above problems are surmounted, a major problem is one of estimating relevant value of the various constant coefficients that enter into an LP problem, i.e. population, prices, etc.

Fifth, one of the defects of this technique is that it is based on the assumption of linear relations between inputs and outputs. This implies that inputs and outputs are additive, multiplicative and divisible. But the relations between inputs and outputs are not always linear. In real life, most of the relations are non-linear.

Sixth, this technique assumes perfect competition in product and factor markets. But perfect competition is not a reality.

Seventh, the LP technique is based on the assumption of constant returns in the

economy. In reality, there are either diminishing or increasing returns.

Further, it is a highly mathematical and complicated technique. The solution of a problem with linear programming requires the maximisation or minimisation of a clearly specified variable. The solution of a linear programming problem is also arrived at with the 'Simplex method' which involves a large number of mathematical calculations. It requires a special computational technique, an electric computer or desk calculator. Such computers are not only costly, but also require experts to operate them. Mostly, the LP models present trial-and-error solutions and it is difficult to find out really optimal solutions to the various economic problems.

USES OF LINEAR PROGRAMMING IN PLANNING

Linear programming as a tool of economic development is more realistic than the input-output approach. In input-output analysis only one method is adopted to produce a commodity. It does not take into consideration the bottlenecks (constraints) which a development project has to face in underdeveloped countries. But in linear programming a definite objective is set to maximize income or minimise costs. All possible processes or techniques are taken into account for achieving the desired objective. This necessitates even the substitution of one factor for another till the most efficient and economical process is evolved. So projects and techniques which are too uneconomical to implement are not undertaken. By assuming certain constraints, linear programming as a tool of development planning is superior to the input-output technique. In underdeveloped countries, the planning agencies are faced with such constraints as the lack of sufficient capital and machinery, growing populations, etc. Resources exist that cannot be used properly for want of the cooperant factors. Linear programming takes due note of these constraints and helps in evolving an optimum plan for attaining the objectives within a specified period of time. Thus the LP technique has been used for constructing theoretical multi-sector planning models for countries like India. Such models extend the consistency models of the input-output type to optimization of income or employment or any other quantifiable plan objective under the constraints of limited resources and technological conditions of production.

In practice, however, the LP technique is being used in solving a limited

number of economic problems in developing countries. This is due to the lack of proper personnel for working out mathematical equations and for operating highly mechanical computers. Mostly the LP technique has been found to be extremely useful for sectoral planning in developing countries, for example, in selecting optimum alternatives in respect of location and technologies in industries, transport, and power or in farm management. For example, this technique is being used in farm management for determining the optimum combination of different crops, livestock and crops. The objective function used in such studies is either the minimisation of costs or the maximisation of income. The constraints are set by predetermined levels of demand or the availability of resources such as raw materials or capacity. Besides, this technique is being used for the solution of diet problem where the aim is to minimise costs, given the values of minimum nutrients of the diet and the prices of products as constraints. It is also with the LP technique that the transport problem is being solved by the railways, airways and transport companies with regard to the selection of routes, transportation of goods, allocation of the means of transport (i.e., railway wagons, aircrafts, trucks etc. depending on the type of transport under study). Again, this technique is used to assign jobs to the work force for maximum effectiveness and optimum results subject to constraints of wages and other costs. Similarly, purchasing, assembling, production and marketing problems are being solved through the LP technique in order to minimise costs and maximise profits, given the various constraints in the case of each problem. However, for an extensive use of this technique for development planning, developing economies will have to depend upon larger resources of trained personnel and finance.

CHAPTER

The Concept of Capital-Output Ratio

MEANING

The concept of capital-output ratio (or capital coefficient) expresses the relationship between the value of capital investment and the value of output. It refers to the amount of capital required in order to produce a unit of output. When the capital-output ratio in the economy is said to be 5: 1, it implies that a capital investment of Rs. 5 crores is essential to secure an output (income) worth Rs. 1 crore. It may thus be defined as "a given relationship between the investments that are to be made and the annual income resulting from these investments." The capital-output ratio is of two types: the average capital output ratio and the marginal or the incremental capital-output ratio. The average capital-output ratio (ACOR) indicates the relationship between the existing stock of capital and the resultant flow of current output. The incremental capital-output ratio (ICOR) expresses the relationship between the amount of increase in out-put (income) Y, resulting from a given increase in stock of capital, ΔK. This can be indicated as $\Delta K/\Delta Y$. In other words, "the average capital-output ratio refers to everything that has been invested in the past and to the whole income. The marginal ratio refers to all that has been added in a

recent period to the capital or income."[1] The former is a static concept, while the latter is a dynamic one. The term capital-output ratio as used in Economics relates to the incremental or marginal capital-output ratio. This ratio normally ranges between 3 to 4 and rotates to a period of time. Since it has a time dimension, it is expressed as "recoupment period" in the communist countries.

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1. Tinbergen. *Development Planning*, p. 79.

The average capital-output ratio and the ICOR are shown in Fig. 1 where output is taken on the horizonal axis and capital on the vertical axis. The average capital-output ratio is measured by the slope of a line from the origin to the function relating capital to total output. In Fig. 1 *OKF* is such a function and *OR* is the ray that passes through it at point *K* so that the ACOR is *KY/OY*. The ICOR is measured by the slope of a tangent drawn to the function at point *K*. Thus the ICOR is *ED/KD* (=ΔK/ΔY).

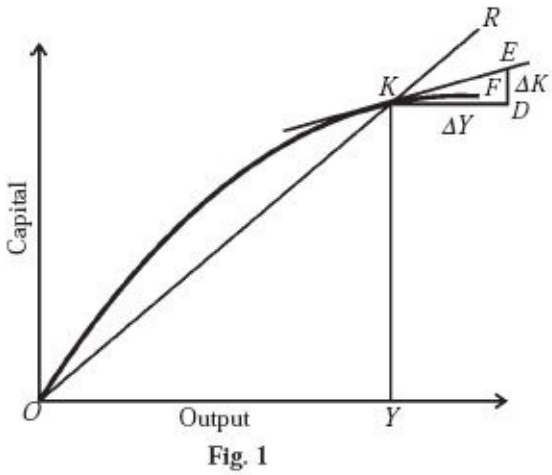

Fig. 1

The concept of capital-output ratio is applicable not only to an economy but also to its different sectors. There are different capital-output ratios for different sectors of the economy depending on the techniques (capital-intensive or labour-intensive) used by them. In a sector using capital-intensive techniques the capital-output ratio would be high and in an other sector using labour-intensive techniques the capital-output ratio would be low. Transport, communications, public utilities, housing and capital goods industries have very high sectoral capital-output ratios. While capital-output ratios in the agricultural sector., manufactured consumers' goods industries and service industries are generally low. The overall capital-output ratio for a country is the average of the sectorial ones.[2]

CAPITAL-OUTPUT RATIO IN UNDERDEVELOPED ECONOMIES

Various estimates have been made of capital-output ratios in underdeveloped economies. A group of experts appointed by the United Nations used a ratio ranging from 2:1 to 5:1; Kurihara has assumed a ratio for majority of under developed countries in the order of 5:1; Singer in his model for economic development assumes a ratio 6:1 in the non-agricultural sectors and 4:1 in the agricultural sector and on an average takes a ratio of 5 :1; Resenstien-Rodan estimates that the ratio is at least 3:1 and 4:1;[3] while Lewis regards this ratio to lie between 3:1 and 4:1.[4] According to H.K. Manmohan Singh, in developed countries the range of capital-output ratio is believed to lie between 2.9:1 and 4:1, and in underdeveloped countries this ratio may be supposed to lie between 1.5:1 and 2:1.[5] In India the ICOR on an average works out to 2.4 for the three plan period.[6]

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2. W .B. Reddaway. "The Capital-output Ratio", *Indian Economic Review*, February, 1960.

3. Meier and Baldwin, *op. cit.*, p. 340.

4. Lewis, *op. cit.*, p. 201.

5. H.K.M. Singh, *Demand Theory and Economic Calculation in a Mixed Economy*, p. 83,

6. Government of India, Planning Commission, *Fourth Five-Year Plan*, 1969-74.

FACTORS DETERMINING CAPITAL-OUTPUT RATIO

The size of the capital-output ratio in an economy depends not only on the amount of capital employed but also on a number of other factors such as, the degree and nature of technological advance, the efficiency in handling new types of capital equipment, the quality of managerial and organizational skill, the composition of investment, the pattern of demand, the relation of factor prices, the extent of the utilization of social and economic overheads and the impact of industrialization, education and foreign trade on the economy. Let us examine these factors in detail.

Availability of Natural Resources. Capital-output ratio depends on the availability of natural resources. A country with abundant natural resources has a low capital-output ratio, for it can substitute natural resources for capital. For example, Norway is a country which has a very high capital-output ratio

because she is not endowed with natural resources.

Growth of Population. Hagen points out that in industrial countries with a rapidly growing population, the capital-output ratio tends to be low. For population growth leads to substantial capital saving in social overheads. Further, population growth absolves an economy from the consequences of errors in investments and 'new investment does not so gravely cause old investments to obsolesce.' In the case of an agricultural country, however, population growth has an adverse effect on the capital-output ratio. If a growing population is absorbed on the cultivable land existing in abundance then not much of capital is required per unit of output, on the assumption that people work with simple tools and implements and no extra public utility services are required. But if the increase in population is concentrated in the towns, more capital will be required to meet its requirements on more houses, power, water, schools, consumption goods etc.

Amount of Capital Employed. The amount of capital employed in a country is an important factor in determining the capital-output ratio. Given the average life of capital, the capital-output ratio is determined by the proportion of national income invested annually. So it is not surprising, writes Prof. Lewis, that countries which invest much the same proportion of national income have much the same capital-output ratio.[7]

Degree and Nature of Technological Advance. If technical progress is accelerated due to a major innovation, the capital-output ratio will tend to rise. The nature of technological advance refers to capital-intensive and labour-intensive innovations. If technological advances are capital intensive in character, the capital output ratio will tend to rise. On the other hand, if technological inventions are labour-intensive in nature. the capital-output ratio will tend to fall.

Rate of Investment. Capital-output ratio also depends upon the rate of investment. The higher the rate of new investment, the higher is the capital-output ratio. A country which doubles its capital in ten years will have a higher output per unit of capital than a country which doubles it in twenty years. This is because new investment and new technology go together. The technology of the last ten years is embodied in half the capital in the first case, but only in

perhaps a third of the capital in the second case.[8]

Efficiency with which New Type of Equipment is Handled. But a low level of efficiency in handling new capital equipment would lead to waste and as a result the capital-output ratio would be high and *vice versa*.

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7. *Op. cit.*, p. 202.

8. W.A. Lewis, *Development Planning*, 1966.

Composition of Investment. The pattern of investment in an economy depends upon the policy of the government. If the government plans a heavy expenditure on public works and public utilities like railways; power, schools, etc., the capital-output ratio would be high. It would also be high in the case of the development of basic and heavy industries. But the capital-output ratio would be low if the pattern of investment is inclined more towards the development of agriculture and cottage industries which are labour-intensive.

Quality of Managerial and Organizational Skill. A country in which the quantity and quality of managerial and organizational skill is high, the capital-output ratio will be low. For it is in a better position to use its capital equipment and other productive resources to the fullest extent and thus a larger output can be had with the existing capital. Contrariwise, if the quantity and quality of entrepreneurship are low, the capital-output ratio will be high.

Pattern of Demand. The pattern of demand also influences the capital-output ratio. Given the prices and income in a perfectly competitive economy, changes in tastes and preferences of the consumers may change the pattern of demand through time. This may, in turn, have important effects on the demand for capital and on the capital-output ratio. For example, the demand for synthetic materials and products like terylene, nylon, etc., has led to the establishment of plants for their manufacture thereby raising capital-output ratio.

Relation of Factor Prices. A change in factor prices (i.e., wages, interest, rent, etc.) affects the capital-output ratio to the extent capital can be substituted for other factors of production. Changes in the rate of interest or wages may affect the demand for capital, thereby affecting the capital-output ratio. A reduction in

the rate of interest, other factor prices remaining constant, is likely to increase investment demand for capital and thus raise the capital-output ratio. Similarly, a rise in the wage level, other things remaining the same, may raise the capital output ratio if there is a possibility of capital being substituted for labour.

Employment Policy. Capital-output ratio further depends on employment policy. In an overpopulated country like India where unemployment exists on a mass scale the policy of the State to provide immediate relief to the unemployed will lead to capital investments on roads, water works, land reclamation, hospitals, schools, houses, and other public works. But if the government policy is towards absorbing the unemployed in large industries especially in manufacturing industries, the capital output ratio would be smaller. But less of capital and labour will be employed in such industries as compared to the public works.

Industrialization. Industrialization tends to raise the capital-output ratio. Industrialization leads to urbanization. Urbanization involves the movement of works from the rural areas to the towns which necessitates larger investment in house building industry, as a result the capital-output ratio is pushed up.

Spread of Education. With the spread of literacy and education, efficiency increases which tends to make a better use of capital equipment whereby the capital-output ratio falls and *vice versa.*

Use of Social and Economic Overheads. In the early stages of economic development there is a tendency to invest more in social and economic overheads which take a long time to fructify, meanwhile the capital-output ratio tends to be high. But with the passage of time, fuller utilization of social and economic overheads creates external economies and leads to increasing returns. This further leads to the fullest utilization of existing capital equipment thereby increasing the output. Thus the capital-output ratio is damped.

Impact of Export and Import. In order to earn more foreign exchange and to avoid balance of payments difficulties, the export sector requires heavy capital expenditure to push up exports. This tends to raise the capital-output ratio. If the nature of investment is such that larger quantities of capital equipment are imported and huge expenditures are incurred on it, the capital-output ratio would be high and *vice versa.*

NATURE OF CAPITAL-OUTPUT RATIO

It is, however, not possible to arrive at any definite conclusion about the behaviour of the capital-output ratio from the factors enumerated above. But a number of economists have proved on the basis of empirical data based on developed economies that the capital-output ratio first tends to rise then declines as development gains momentum and even becomes stable over a long period. Prominent among these economists are Colin Clark,[9] Simon Kuznets[10] and Leibenstein.[11] This parabolic nature of the capital-output ratio is supported by the following empirical evidence. In the United States the capital-output ratio rose from 2.8 in 1880 to about 3.9 in 1929 and then fell to 3.2 in 1944,[12] and to 1.6 in 1960. In the UK, it rose from about 4.5 in 1865 to over 6 in 1895 and stayed almost stable up to 1913,[13] when it started declining and was 2.9 in 1952.[14] No doubt, these estimates relate to developed economies yet they are a useful guide in understanding the general behaviour of the capital-output ratio in underdeveloped economies. V.V. Bhatt on the basis of his computations of Indian industries and their comparison with the industries of the developed countries comes to the conclusion that the capital-output ratio is on an average about the same in both developed and underdeveloped economies.[15] The experience of a number of countries suggests that on an average the ratio lies between 3:1 to 4:1 and above 4:1 only in periods of slow economic growth. A UN study corroborates that during the ten years ending in 1963 about 70 per cent of the developing countries had an incremental capital-output ratio ranging between 3 and 4.[16] We may wind up the discussion thus, “In the early stages of economic development two contrary forces operate on the capital-output ratio. On the one hand, there is a vast requirement of basic overhead capital in transport, power, education, etc. Here, due mainly to the long period over which such investment yields its return, the apparent (short run) capital-output ratio is high. On the other hand, there are generally large unexploited backlog of known techniques and available natural resources to be put to work; and these backlogs make for a low capital-output ratio. We can assume formally a low capital-output ratio for the take-off period on the assumption that the pre-conditions have been created. In fact, the aggregate marginal capital-output ratio is likely to be kept high during take-off by the requirement of continuing large outlays for overhead items which yield

their returns only over long periods. Nevertheless, a ratio of 3 : 1 or 3.5 : 1 for the incremental capital-output ratio seems realistic as a rough bench-mark "[17]

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9. Colin Clark, *The Conditions of Economic Progress*, p. 580.

10. Population, Income and Capital, *International Social Science Bulletin*, 1954, No. 2, Vol. 6.

11. *Economic Backwardness and Economic Growth*, pp. 177-85.

12. Simon Kuznets, *op. cit.*, pp. 169-70

13. *Ibid*.

14. H.K. Manmohan Singh, *op cit.*

15. V.V. Bhatt, *Employment and Capital Formation in Underdeveloped Economies*, pp. 20-59.

16. *World Economic Survey*—1966, *op. cit.*

17. W.W. Rostow, *The Process of Economic Growth, op. cit.*, p. 211. Italics mine.

CASE FOR LOW OR HIGH CAPITAL-OUTPUT RATIO IN UNDERDEVELOPED COUNTRIES

Economists, however, differ on the issue whether the capital-output ratio should be low or high in underdeveloped countries.

Low Capital-Output Ratio. Those who favour a low capital-output ratio advance the following arguments:

(1) Prof. Lewis points out that the ratio of capital in existence to annual income is much lower in underdeveloped countries because their rate of capital accumulation has been much smaller.[18]

(2) In under developed countries natural resources are underutilized or unutilized and a small capital investment will lead to a large output.

(3) Similarly, in an underdeveloped country other productive resources are underutilized and their productive capacity is low. So when a country starts on the road to economic progress land, labour, management and existing plant and equipment are brought back into productive use. Thus their productive capacity increases more than the amount of capital invested.

(4) The capital-output ratio is lower in those countries where population grows more rapidly. The reason being that "rapid population growth prevents waste of capital by assuring markets for almost any investment; and a rapid increase in the labour supply permits capital accumulation without departing from the optimal ratio of labour to capital."

(5) In view of the shortage of capital and the abundance of labour, there is greater incentive to use capital saving methods of production in underdeveloped countries.

(6) If in the early stages of development, it is planned to concentrate on agricultural development and other labour-intensive industries, the capital-output ratio will be low. For it is possible to have a large output with a smaller amount of capital.

(7) Since capital is not fully utilized in underdeveloped economies the rate of depreciation is lower which means longer life of plant and equipment and low capital-output ratio.

High Capital-Output Ratio. Economists who favour a high capital-output ratio for underdeveloped countries adduce the following reasons:

(1) The capital-output ratio is higher in underdeveloped countries because there is much wastage in the use of capital. Capital is wasted in the sense that manpower is inefficient in handling and maintaining capital equipment properly. Moreover, due to ignorance of fruitful investment opportunities, capital is unable to move out of the rut to be utilized in more productive channels.

(2) The level of literacy and education is extremely low in such countries with the result that technological knowledge grows very slowly and where the growth of technological knowledge is slow, capital is less fruitful.

(3) The capital-output ratio is bound to be high in those underdeveloped countries where a large quantity of capital is needed to tap unutilized or underutilized natural resources. As is the case with oil exploration in India.

(4) Moreover, countries with limited natural resources require more

substitution of capital for them.

(5) The capital-output ratio is expected to be high in those countries where population increases more slowly than in those where it increases rapidly, on the premise that "capital is likely to yield more if used with a greater rather than with a smaller increase of labour."

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18. W.A. Lewis, *op. cit.*, p.202.

(6) As an economy moves on the path of economic development, the pattern of demand is likely to exchange which may necessitate the establishment of more capital-intensive industries. For example, a change in demand from handmade to machine made goods would increase the demand for capital.

(7) In the early stages of development, under developed countries have to make large capital investments in order to provide social and economic overheads such as schools, hospitals, roads railways, and electricity, etc. Thus the capital-output ratio is bound to be high.

(8) According to Prof. Kurihara, one basic explanation for the needlessly high capital-output ratio of an under developed economy is promotion of more labour-intensive techniques which may reduce output thus necessitating a greater use of capital.[19]

(9) In under developed countries interest rate is very high and this is another important explanation for the capital-output ratio to be so high in such economies. On the face of it, it sounds paradoxical, for a high rate discourages rather than encourages the use of capital and thus has a tendency to lower the capital-output ratio. Kurihara admits this fact but solves this paradox by applying the reasoning that "the expectation of a continuing high interest rate tends to promote less 'capital-intensive' (or more 'labour-intensive') techniques and, via the latter's decreasing impact on output to make for a high capital-output ratio, given a constant wage rate and a constant net profit rate."[20]

(10) In underdeveloped countries where new plants and enterprises are located away from the sources of raw materials, capital investment may be

larger relatively to output thereby raising the capital-output ratio.

(11) *Lastly*, in the initial stages of development certain types of capital investments are likely to remain underutilized due to the stagnant nature of an underdeveloped economy thus raising the capital-output ratio.

LIMITATIONS

The use of capital-output ratio as a tool for estimating capital requirements in underdeveloped countries is beset with a number of limitations:

(1) "Precise calculations of capital-output ratio can be made only in the light of concrete programmes of development and the technical data regarding costs and output.[21] But such data are not easily available in an underdeveloped economy. Concrete programmes of development are hampered by lack of capital equipment, labour and entrepreneurial skills, changes in demand, prices and climatic conditions which adversely affect the output.

(2) The capital-output ratio is not likely to remain constant throughout a plan. It is bound to change as the development plan proceeds from year to year. As a result, there is wide disparity between the projected ratio arid the actual ratio. For instance, the First Indian Five-Year Plan assumed a marginal capital-output ratio of 3:1 but realized 1.8:1 in practice.

(3) The use of capital-output ratio as a tool of economic planning is circumscribed by the presence of underutilization of excess capacity in the use of resources in an underdeveloped economy. It is, therefore, difficult to calculate the capital-output ratio accurately.

(4) The capital-output ratio is meant to estimate the total capital requirements of an economy but fails as a tool for determining priorities among different sectors or projects in the economy.

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19. K. Kurihara, *op. cit.* pp. 94-97.

20. *Ibid*., pp. 98-99.

21. Government of India, *Second Five-Year Plan, op. cit.*

(5) The capital-output ratio fails to tell us anything about investment in human capital required to achieve a certain rate of growth. Investment in human capital is as important for economic growth as is physical capital.

(6) There is, however, a practical difficulty in calculating the capital-output ratio. It assumes that there is no change in the general art of production. But it is possible that a technological innovation may increase output with the same amount of capital or the same output may be had with less capital thereby changing the capital-output ratio altogether.

(7) The concept of capital-output ratio is based on the implicit assumption that when capital increases the supply of cooperant factors also increases. But in an underdeveloped economy the co-operant factors like technical personnel, entrepreneurship, power, transport, etc., are scarce. The concept is thus impracticable in the context of an underdeveloped economy.

(8) Difficulties arise in the measurement of "capital" and "output." Prof. Myrdal mentions the following:

First, in underdeveloped economies all planned public investment and estimated private investment are lumped together to arrive at capital input which is not a correct estimate of capital investments for they are likely to change.

Second, various restrictions and direct controls prevent prices from equalising demand and supply. It requires the use of which is again arbitrary.

Third, "the specificity, heterogeneity, complementarity and indivisibility of capital in South Asia make aggregation impossible."

Fourth, "if there are several items on each side of the capital-output ratio, and if those do not change in the same proportion, we are faced with the problem of index numbers, including the indeterminancy introduced by price changes in the planning period and by different income distributions."

Fifth, "anything that changes the relative prices of capital goods and consumer goods generally, whether from the demand side or the supply side will alter the capital-output ratio, even without any change in physical capital,

physical output or technology. In particular, changes in real wages, in the rate of interest and in the prices of imports will change the capital-output ratio, even though neither the composition of capital nor techniques have changed'?

(9) During a depression, all increases in capital will be followed by declines in output and the capital-output ratio becomes a meaningless concept in such a situation.

(10) Above all, the use of capital-output ratio as a technique for testing the development plans of a country does not take us very far unless we go behind it. The overall capital-output ratio is the average of the sectoral ratios. The national output is the sum of different goods and services produced by various sectors of the economy, each having a different capital-output ratio. The sectoral capital-output ratios are high for some sectors like housing, transport, communications,-irrigation and power projects; and low for the agricultural service and consumers' goods industries. But it is difficult to calculate these sectoral capital output ratios due to lack of statistical data. Conceptional difficulties also arise in the case of certain items like fertilizer production which can be placed in either the agricultural sector or the heavy industries sector. Thus the overall capital-output ratio which is a made up of sectoral ratios is not a correct estimation for testing the consistency of the developmental plan.

Conclusion. Despite these theoretical and practical limitations, the capital-output ratio is widely used as a planning device. Its predictability is weak, but it appears to produce more meaningful results in the long run than in the short run. It is analytically useful in calling attention to the importance of capital in economic development. It possesses great usefulness as a handy device for making rough-and-ready calculations. But **Prof. Kindleberger** is of the view that in its present rudimentary stage it is hardly a planning device.[22]

IMPORTANCE IN PLANNING

The capital-output ratio is an important and useful concept for purposes of economic planning in an underdeveloped country. "This is particularly true where it is necessary to check the consistency of targets for the growth of national income against the additional capital likely to be available from

current savings of foreign investment." In order to estimate the financial requirements of growth, it is necessary to have an estimate of the volume of investment needed to attain a given target of output. The capital-output ratio is thus used to determine the growth rate of an economy. The Harrod-Domar models of growth are based on this concept.

In formulating a plan, an ICOR is required for the purpose of calculating the growth rate of the economy. Suppose we want to increase national output by 10 and assume the ICOR to be 2. In this case the required addition to the capital stock needed for new investment will be (10x2=) 20. Assuming the current level of national output to be 1000 and the saving rate 0.04, the domestic saving will be 40. Now this much of domestic saving can be invested for the purpose of increasing national output. Given the ICOR of 2, this amount of saving and investment would increase national output by 20 (=40/2). This gives the growth rate of 2 per cent per annum in national income. We can also calculate the growth rate of national output (income) by dividing the saving ratio by the ICOR, i.e., 0.04/2=0.02 or 2 per cent.

Moreover, the importance of capital-output ratio lies in making out the case for obtaining large foreign aid for investment by underdeveloped countries. Since the domestic saving-income ratio is low in underdeveloped countries, a higher rate of foreign aid is required for achieving a higher growth rate, assuming a conventional capital output ratio of 3 to 4. Thus the concept of capital-output ratio is a useful tool which highlights the importance of capital in development planning, helps in testing the consistency of the desired growth rate and the resourcers of an underdeveloped country.

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22. C.P. Kindleberger, *op. cit.*

CHAPTER

The Choice of Techniques

One of the problems facing the underdeveloped countries is how best to utilize the available resources in order to accelerate the growth rate of the economy. Majority of such countries have abundant labour but scarce capital. These two major factors pose the problem of choice of techniques—that of using the traditional or the modern methods of production.

MEANING

The problem of choice of techniques refers to the type of combinations for any particular project or enterprise. A combination chosen in any particular case gives the type of technique. The number of alternatives open to an underdeveloped country are between labour-intensive and capital-intensive techniques, between light and heavy industries and between agriculture and industry. But the ultimate choice is one of selecting between labour-intensive and capital intensive methods whether it is in agriculture and industry or in light and heavy industries. "Different techniques often imply quite different strategies in economic development with very different efforts on the performance of the economy."[2] The ultimate object is to choose that technique, which is more efficient than another technique keeping in view the existing factor proportions. An efficient technique is one that minimizes the costs of a

given output or maximizes the output from given inputs.

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1. A slightly modified version of author's article in *AICC Economic Review,* July, 1967. Published with the kind permission of the Editor.

2. A.K. Sen, *Choice of Techniques*, p. 11.

PROCESS OF TECHNOLOGICAL DEVELOPMENT

For technological development, a society has to pass through a long historical process—from simple to complex techniques, from those satisfying local needs to those meant for distant markets and from those using local resources to those requiring foreign capital. However, Kuznets[3] traces some distinct patterns in the growth of technology:

(*i*) a scientific discovery or an addition to technical knowledge;

(*ii*) an invention that is, making the use of already existing knowledge to useful end;

(*iii*) an innovation implying a significant application of an invention to economise production;

(*iv*) an improvement, signifying a minor useful change in an invention; and finally, the spread of invention usually accompanied by improvements. The successful completion of these successive phases in the evolution of technology requires four factors.

First, there is the necessary condition of increased scientific knowledge.

Secondly, each phase requires heavy capital investment and skilled labour force.

Thirdly, innovations require enterpreneurial skill and ability to put inventions to beneficial uses.

Lastly, the spread of innovations depends on the willingness of the people to adopt new products and processes for mass production. Technological development is thus a necessary conditions for economic growth.

But the conditions enumerated by Kuznets are conspicuous by their absence in under developed countries which lack educational and research facilities, skilled labour and entrepreneurial ability. Their levels of income, consumption and savings are extremely low and hence also the size of the market. Dynamic entrepreneurship which Schumpeter regarded as the main factor in inducing an innovation is lacking in such economies due to backward social, economic and political institutions. Thus, the type of innovations that contribute to the economic development of the advanced countries cannot be evolved in underdeveloped countries with their existing factor endowments.

LABOUR-INTENSIVE TECHNIQUES

Keeping these points in view, the problem of choice of techniques boils down to one of adopting output-increasing techniques that raise labour productivity per unit of capital and are capital-light and labour intensive. Fig. 1 explains the impact of labour-intensive techniques on output. Initially, output represented by the isoquant *Q* was being produced in the economy by employing *OK* amount of capital and *OL* of labour. Now with the new technique the same amount of capital *OK* helps in producing a larger output represented by a higher isoquant Q_1 and at the same time it uses more labour LL_1. Such techniques should also fulfil the twin objective; of skill and capital formation. Agricultural production can be increased through the spread of minor irrigation schemes, better tools and implements, the introduction of short duration crops leading to larger yields from the same land; the use of fertilizers and high yielding seeds, etc. In India, the substitution of the fly-shuttle for the throw-shuttle loom led to increase in the productivity of the handloom weaver by 50 per cent.[4] But it is not true that the choice of more labour-intensive techniques will necessarily lead to either more consumption or greater employment over a period of time. The problem is one of evaluating the time streams of consumption associated with the choice of alternative techniques over the relevant time horizon.''[5] Moreover, under developed countries fail to use output-increasing labour-intensive techniques because of the limits set by the shortage of capital and lack of skills.

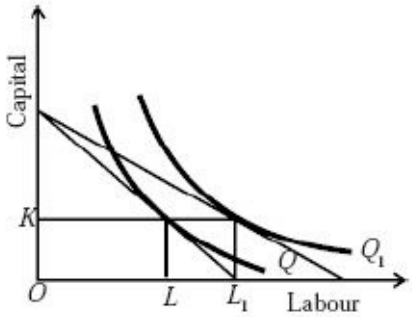

Fig. 1

Besides, as Bert Hoselitz[6] reveals on the basis of a variety of research papers, a number of economic, social and administrative resistances which force people in such economies to give preference to the use of outmoded techniques over output-increasing methods of production.

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3. Simon Kuznets, *Six Lectures on Economic Growth*, pp. 30-32.

CAPITAL-INTENSIVE. MODERN TECHNIQUES

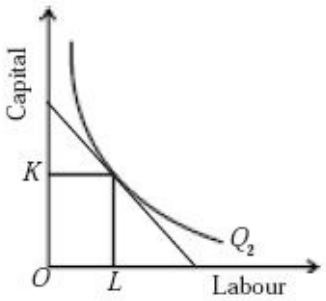

Fig. 2

The other alternative commonly suggested is the use of capital-intensive techniques. Since underdeveloped countries are unable to follow the path of technological evolution of the advanced countries they should use the technology of the latter on an extensive scale. Fig. 2 depicts the use of advanced technology which is capital-intensive. It uses more capital *OK* in relation to labour *OL*. The level of output is higher in this technique on the supposition that the isoquant Q_2 is above Q_1 of Fig. 1. As Galenson and Leibenstein opine: "Successful economic development... particularly in the face of gross backwardness, hings largely upon the introduction of modern technology upon as large a scale as possible''[7]For a "continuing and compounding effect" on the growth rate of income, advanced techniques are considered to be indispensable. Further, their use will help change customary working habits, living conditions, social institutions and the very outlook of the people.

But the adoption of modern technology in underdeveloped countries is a very ticklish question and we should not forget Nurkse's remarks that "the same capital-intensity as in the economically advanced countries should be neither desired nor permitted."[8] *First*, it is a matter of common knowledge that these countries have a plethora of the unemployed and an acute shortage of capital. Modern technology is, however, highly capital-intensive and labour-saving. It involves high costs and excessively large amount of capital, thereby making it unsuitable for underdeveloped countries.

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4. *Report of the Fact Finding Committee (Handloom and Mills)*, Government of India, p. 195.

5. Ajit K. Dasgupta, *op. cit.* For a detailed explanation refer to Sen's Time Series Criterion in the next chapter.

6. B.F. Hoselitz, "Problems of Adopting and Communicating Modern Techniques to Less Developed Areas.," *Economic Development and Cultural Change*, January 1954.

7. W. Galenson and H. Leibenstien, "Investment Criteria, Production and Economic Development, "*Quarterly Journal of Economics,* August 1955.

8. R. Nurkse, *op. cit.*, p. 45.

Second, imports of plant and equipment are not only costly but also entail a number of difficulties with regard to repairs, maintenance and availability of spare parts. A UN Report observes: "Automatic devices suited to conditions in advanced industrial countries are often left unused in underdeveloped countries, while the intricacy of many machines though appropriate to the type of labour available in industrial countries, tends to magnify repair and maintenance cost in factories in less developed countries which depend upon a high proportion of unskilled labour"[9] As a result, the same equipment produces less in such countries. It means in terms of our Fig. 2 that the isoquant Q_2 is at a lower level.

Third, heavy imports lead to balance of payments difficulties. And the net addition to the national income accruing from the use of imported plant and equipment is less, for a part of the income flows to the technique-exporting country.

Fourth, modern technology also requires complementary supplies of highly skilled, technical and managerial personnel not available in less developed economies.

Fifth, it is meant for the setting up of larger enterprises whereas the small size of the market in such countries necessitates the expansion of small enterprises. In such a situation, write Bauer and Yamey, there is the danger of confusing standards of technical efficiency with those of economic efficiency. There is no use recommending techniques which may be efficient technically but are wasteful in terms of resources and inappropriate at the level of technical achievement of the local population.[10]

Sixth, modern technology was evolved under different socio-economic and

geographical set up. It is meant to accommodate labour shortages and other requirements of an advanced country. It is appropriate to high real wages and a high standard of living.

Seventh, the possibility of introducing such technology will, however, depend on 'the technological spread'—the gap separating the techniques already in vogue in the less developed country and those imported from abroad. The larger the gap between the local and the imported techniques, the greater will be the social discontent and unrest following industrialization through the introduction of advanced technology,

Last, the adoption of modern technology presupposes the existence of power, transport and communications facilities, of highly trained technical personnel and a large number of related services which are non-existent in underdeveloped countries. Under these circumstances, the use of advanced technology will only result in repeated breakdowns in the machinery, lower production, increase in costs and wastage of capital.

USE OF ABANDONED TECHNIQUES OF ADVANCED COUNTRIES

But the problem of economic development is concerned with change in factor proportions and how rapidly they change. It depends on the time-period involved. Capital-light and labour-intensive techniques might help in raising the level of output, employment and income during the short period to some extent. Development, however, aims at their continuous maximization over the long period. The question is whether an underdeveloped country should go slow or make rapid strides towards developing its economy. Should it introduce modern technology or continue to use backward methods of production or adopt obsolete techniques abandoned long ago by advanced countries? Taking the last question first, the other two having been already discussed above, backward economies have frequently made use of obsolete equipment and techniques of the advanced countries. The history of the Japanese textile industry reveals that it developed in its early phase on discarded British machines. Israel and Argentina have also been importing used equipment of the advanced countries. Though discarded machines are considered to be somewhat cheap and of a lower capital intensity, they entail

high costs in terms of repeated breakdowns and constant repairs. Therefore, prudence demands that developing countries should benefit from the vast fund of knowledge in the field of technology of the advanced countries and modify and adapt the techniques of the latter according to their social, economic and technical absorption capacity and requirements. These requirements necessitate in the initial stage of development, the adoption of labour-intensive and capital-saving techniques so that the limited amount of capital available is broadly spread in utilizing larger human and other resources.

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9. UN., *Processes and Problems of Industrialization in Underdeveloped Countries*, p. 27.

10. P.T. Bauer and B.S. Yamey, *op. cit.*, p. 213.

INTERMEDIATE TECHNOLOGY

Prof. Schumacher[11] favours intermediate technology for LDCs. According to him, if we define the level of technology in terms of 'equipment cost per workplace', the intermediate technology would be on the level of—symbolically speaking £100 equipment cost per average work-place, whereas it is £1 for the indigenous technology of a typical developing country and £1000— technology for the developed countries. Such a technology necessitates regional approach to development and requires four conditions for its success. *First*, workplaces should be created in those areas where majority of the people live and not in metropolitan areas where they tend to migrate.

Second, workplaces should be cheap so that they can be created in large numbers without requiring high level of capital formation and imports.

Third, methods of production should be fairly simple, requiring low skills and suitable for maintenance and repair on the spot.

Fourth, production should mainly depend upon local materials and be mainly for local use. Thus the intermediate technology will be 'labour-intensive' and will be suitable in small scale industries. Therefore, such a technology can be used to produce only those commodities which are urgently needed by the people living in rural areas. Such commodities can be building materials, clothing, household goods, agricultural implements, etc.

APPROPRIATE TECHNOLOGY

There is, however, unanimity among economists over the choice of appropriate technology. According to Yale Brozen,“ The appropriate technology for an area depends on its resources, patterns and its markets. “It is, therefore, defined as “an amalgam of skills, methods, techniques, appliances and equipment that can contribute towards solving the basic socio-economic problems of the concerned communities.” It should be utilised for development purposes in the name of social justice and should be capable of satisfying the felt needs of the people. It should be economically viable, technically feasible,’and should fit in the socio-economic fabrics of local communities. It should be able to produce some surplus, so as to encourage capital formation and stimulate further growth. It should be simple and comparatively cheap and use local resources. It should ensure proper control of the means of production at local levels. It should be labour-intensive and capital-saving. It should ensure dispersal of wealth among the largest number of people and create a sense of participation and decision-making at the local level. It should be capable of creating self-reliance and should perpetuate the emotional attachment of the workers with their jobs, tools and work places. It should encourage production by masses rather than mass production. It should be ecologically sound and should be in complete harmony and conformity with local environments. Dependence on non-renewable sources of energy should be at a minimum. It should not be static but dynamic and should be able to absorb innovation, thus promoting to improve efficiency and productivity. In other words, appropriate technology should change with the time, and people should accept the improved and latest versions of it, that fit in the new environments. It should neither be based on traditional technology nor reject modern technology.[12] In all advanced countries from the US to Japan, there are small industrial units and agricultural areas where techniques and equipment of a low capital-intensity are used. Efforts should be directed towards “choosing the simplest of such alternative techniques, the sturdiest of available capital equipment, the small type of plant consistent with technical efficiency, the technology that makes the best use of the most plentiful factors of production.”[13] In certain cases much simpler modern techniques involving small capital may bring about large increments in output in the case of small industries. Low-cost high productivity equipment and machines can be imported from advanced

countries and their prototypes manufactured within the country with indigenous skill and raw materials. It will serve the dual purpose of skill and capital formation. In the agricultural sphere, the use of power-driven pumps, the Japanese method of rice cultivation, high yielding maize hybrids and improved fertilizer can go a long way in increasing productivity per worker. In the case of those underdeveloped countries which have just started on the path of economic development, it is better to adopt well-tried capital-saving labour-intensive productivity-raising technology originating from the developing countries. For instance, India manufactures a large number of farm implements indigenously deigned, such as the mechanical plough, animal driven ploughs of a number of varieties, hand tools, irrigation equipment, dairy and poultry farm equipment which can fit in the factor proportions of similar countries without any difficulty. This is nothing except appropriate technology.

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11. E.F. Schumacher, *Small is Beautiful*, 1973.

Vakil and **Brahmanand** also favour this when they opine that "each country has to work out its own salvation, and particularly to find out which production methods are feasible for it,,"[14] They recommend the following techniques for use in underdeveloped countries:

(*a*) those which can be easily learnt in a short time;

(*b*) those requiring small initial investment;

(*c*) those which reduce the gestation period of investment;

(*d*) those requiring less investment in specialized and skilled labour;

(*e*) those saving scarce resources rather than labour; and finally,

(*f*) those which raise the level of production and increase supplies of minerals or electricity. These guidelines point towards the use of appropriate technology in developing countries in keeping with their local conditions. As **Henry Aubrey** emphasizes: "It may be sound procedure to improve technology step by step in many places atonce, rather than to sink large

portions of a limited capital supply in a few large ventures."[15] This policy is advantageous in many ways. It spreads the benefits accruing from the use of different techniques in the various fields more equally over the entire population; helps in skill formation at all levels; raises the average productivity, income level and the size of the market. It promotes more employment, better distribution of wealth and paves the way towards self-sufficiency. The strategy of gradual changeover from capital-light and labour-intensive methods of production to up-to-date capital-intensive methods is best suited to underdeveloped countries in the early stages of industrialization. Such a policy will not only economize the use of available capital resources but will also create larger employment opportunities. By increasing the supply of agricultural and manufactured consumer goods, it will obviate the necessity of importing food and raw materials. It will not be essential to import much capital goods either. Thus, this strategy in the choice of techniques will tend to check inflationary tendencies and balance of payments difficulties inherent in the development process.[16]

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12. R Das, *Appropriate Technology: Precepts and Practice*, pp.IX. 11-14, 122-124.13. UN, *Process and Problems, op. cit.*, p. 43.

14. C.N. Vakil, *Poverty and Planning*, p. 171.

LABOUR-INTENSIVE VS CAPITAL-INTENSIVE TECHNIQUES[17]

A common characteristic of underdeveloped countries is the scarcity of capital and abundance of labour. In other words, the capital-labour ratio is extremely low. Commonsense tells us that in such countries efficient production calls for labour-intensive techniques. But this is essentially a static argument. It is relevant to conditions prevailing at a point of time. Therefore, this technique is not very much suitable for a developing country. As Dobb says, "It starts from a given endowment of capital in each country, whereas the crucial question at issue in discussing policies of economic development concerns change in the capital-endowment of country and how rapidly this capital endowment should be changed."[18]

Though Prof. Nurkse holds the view that underdeveloped countries should

adopt labour-intensive techniques of production in the early stages of industrial development, majority of economists favour the adoption of capital-intensive techniques in such countries. Let us discuss the arguments advanced in favour of either of these techniques:

Arguments for Labour-intensive Techniques. The arguments usually advanced in favour of labour-intensive techniques are the following:

(1) The first is the employment argument. A characteristic feature of underdeveloped countries is the abundance of idle manpower. It is only by using labour-intensive techniques that increasing employment opportunities can be provided to the idle or underemployed labour force.

(2) When employment increases through the adoption of labour-intensive techniques, "they spread the total income generated more widely over the population." This paves the way for an egalitarian structure of society.

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15. H.G. Aubrey, "Small Industry in Economic Development," *Social Research*, September, 1951.

16. Also see the conclusion to the next section.

17. The words 'labour-intensive' and 'capital-saving' are often used as synonyms. But this is a wrong notion. Prof. Reddaway makes a very clear distinction between the two in *The Development of the Indian Economy.* He defines a labour-intensive technique in the conventional way 'as one in which a large amount of labour is combined with a small amount of capital.' A 'capital-saving technique is one-which requires little capital per unit of output; the amount of labour which will be coupled with the capital is irrelevant. In a similar way the distinction between 'capital-intensive' and 'labour-saving' techniques can be made.

18. Nurkse, *Some Aspects of Economic Development, op. cit.*, p. 54

(3) The third is the latent resources argument. In underdeveloped countries there is an acute shortage of capital and entrepreneurial resources. The use of labour-intensive techniques would be more appropriate for releasing these scarce resources to be used in more important uses.

(4) Similarly, labour-intensive techniques are import-light, i.e., they require simpler tools and implements which need not be imported from abroad, and thus there is considerable saving in foreign exchange.

(5) Labour-intensive techniques are indispensable for counteracting

inflationary pressures in a developing economy. They quickly increase the supply of consumable goods and thus obviate the danger of inflation.

(6) The use of labour-intensive techniques is usually found In the villages and small towns. This would obviate the necessity of building houses and other social works for the workers. This would mean considerable saving in the community's expenditure on social overheads in the initial stages of development which could be utilized on more important projects.

(7) Moreover, labour-intensive methods, being spread out into villages and small towns, enjoy all the advantages of decentralization and avoid the evils of the factory system.

(8) The emergence of monopolies and concentration of economic power in the hands of a few is also avoided.

Arguments for Capital-intensive Techniques. It has been strongly argued that those investment projects should be chosen which are capital-intensive rather than labour-intensive. According to Galenson and Leibenstein, "Successful economic development... particularly in the face of gross backwardness, hings largely upon the introduction of modern technology upon as large a scale as possible."

The grounds on which this argument is based are:

(1) Enterprises using capital-intensive'techniques lead to a large share of the resulting income going to entrepreneurs and a smaller share going to wage earners. Since the propensity to save is higher on the part of entrepreneurs, savings increase and a larger proportion of them are utilized for investment. Thus the rate of economic growth is accelerated.

(2) As a corollary to this,we can say that since the growth rate is much faster under capital-intensive techniques than under labour-intensive techniques, more employment will be offered to the labour force in the long run.

(3) In the majority of underdeveloped countries the growth rate of population is very high and unless capital-labour ratio is raised, output per head will not increase. This will tend to dampen the rate of capital

accumulation. So the use of capital-intensive techniques is indispensable for increasing the tempo of development.

(4) Capital poor countries can ill afford to waste capital through obsolescene and depreciation. Underdeveloped countries should, therefore, choose highly capital-intensive production techniques that do not become obsolete soon. Thus a small production of capital goods is required to be replaced in the future and more capital is available for further capital formation.

(5) Capital-intensive processess of production are more profitable than labour-intensive techniques because under the former productivity rises more rapidly in relation to costs. This is due to economies of large scale production enjoyed by them.

(6) In reality, the use of highly capital-intensive techniques leads to the production of quality products and lowering of costs. Low costs mean low-prices and provide the basis for a rapid rise in living standards later on. Prof. Hirschman opines: "The firm requirement of high standards of quality is an element in favour of, rather than, as would usually be believed, against the introduction of this type of production into underdeveloped countries."[19]

(7) Capital-intensive techniques have far reaching effect on the process of economic growth. A few capital-intensive projects have a greater total impact on the economy than a number of labour-intensive projects. As Hirschman points out: "When a government undertakes the construction of a large hydro-electric station or of a steel mill, it cannot afford to let such ventures go wrong. It places itself under a far stronger compulsion to deliver than if it were to spend the same funds on a large number of projects.

(8) Hirschman further argues that capital-intensive techniques are bound to enhance skills and efficiency and assist in training management "in the performance of new unfamiliar and perhaps somewhat uncongenial tasks." Thus capital-intensive techniques possess the twin-property of 'efficiency enhancing and coordination-promoting'.

(9) For providing economic and social overheads large capital investments are essential in underdeveloped countries.

CONCLUSION

We have studied both sides of the problem and it is rather difficult to decide as to which technique should be adopted in an underdeveloped country. In fact, the two approaches are not altogether different from each other. The use of labour-intensive techniques tends to increase production and employment in the economy. On the other hand, the adoption of capital-intensive techniques tends to accelerate the rate of capital formation and then to maximize productive capacity and employment in the long run. But in making a choice between labour- and capital-intensive techniques in the context of an under-developed country, it is necessary to consider a variety of factors: their comparative cost of production; effects on employment, income, saving, and investment over different time periods; use of domestic resources; effect on domestic and foreign demand; their ability to ease inflationary pressures; and balance of payments position. The cost of production of goods manufactured with labour-intensive methods is higher than that with capital-intensive techniques because of the inability of the former to realize economies of scale. But this fact should not deter the planners from deciding upon labour-intensive techniques which economise on the use of scarce capital resources. Such methods of production create large employment opportunities and help in increasing the supply of consumer goods, obviate the necessity of importing raw meterials, food and capital goods from abroad. Thus they tend to check inflationary tendencies and balance of payments difficulties inherent in the development process. But there is a snag. Use of labour-intensive techniques cannot step up the rate of capital accumulation as fast as that of capital-intensive techniques. No doubt, labour-intensive methods create more employment and thereby raise income levels, but of those whose income are low and propensity to consume is high. So a smaller proportion of the income generated is available for saving and reinvestment. But keeping in view the larger interest of the masses, labour-intensive techniques should be used in the consumer goods sector. For a “continuing and compounding effect” on the rate of growth of income, capital-intensive techniques should be confined to the capital goods sector.

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19. A.O. Hirschman. *op. cit.*. p.144.

CHAPTER

Transfer of Technology

INTRODUCTION

Technology is often identified with knowledge about improved machinery, products and processes. But Frances Stewart[1] uses a wider connotation. According to her, technology consists ofa series oftechniques. It includes methods used in marketed and non-marketed activities, nature and specifications ofthe product produced and its techniques. It also includes managerial, marketing and information services. It encompasses the organisation ofproductive units in terms ofscale and ownership. Technology also extends to services, manufacturing and agriculture. As succinctly put by Akio Morita, the Chairman ofSony Corporation in 1992: Technology alone is not innovation. True innovation requires creativity in technology, creativity in product planning, creativity in marketing and in innovative management. It is in the wider sense that we shall be discussing the need, channels, and problems oftechnology transfer from the developed to developing countries.

1.Frances Strewart,*Technology and Underdevelopment*, 2/e, 1977.

NEED FOR TRANSFER OF TECHNOLOGY

The need for technology transfer to LDCs from the developed countries arises on the following grounds:

1. To Overcome Backwardness. LDCs are in the backward state of technology. Their technological backwardness is reflected in high average cost ofproduction despite cheap labour, in low productivity of labour and capital, in the predominance of untrained and unskilled workers, and in high capital-output ratio. Technological backwardness, in turn, has led to their economic backwardness which is reflected in poverty, inequalities and unemployment. The transfer of technology from the developed countries brings advanced production techniques and machines, innovations in products, and skilled personnel, organisational experience, marketing techniques, etc. Thus technology transfer is required to overcome the backwardness ofthe LDCs.

2. To Increase Productivity. The transfer of technology from the developed countries is required by the LDCs to increase the productivity of labour, capital and other factors ofproduction in order to lower the per unit cost ofproducuon. This can be done by transferring capital intensive technologies from the developed countries.

3. To Reduce Poverty, Inequalities and Unemployment. The three pressing problems of the LDCs are poverty, inequalities and unemployment which can be solved by raising the level of income of the people. By transferring labour-intensive technologies from the developed countries, the LDCs can provide larger employment opportunities to the poorer people. This will tend to raise their incomes and help in reducing poverty and inequalities.

4. To Increase the Growth Rate. Technology transfer is needed by the LDCs to increase the growth rate of their economies. For this a long-term policy of technology transfer is required for them. Prof. Edward Chen[2] has classified the long-term economic growth in relation to the technology level into three stages. According to him, the critical determinant of long-term economic growth is the difference between *T* (technology level) and *W* (wage level):

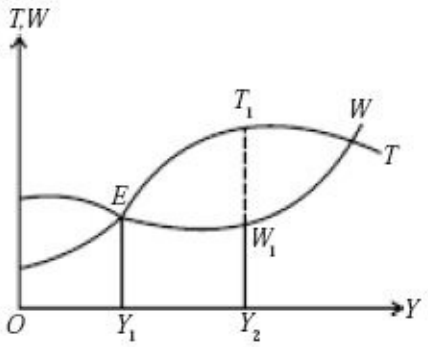

Fig. 1

$$Y=F(T-W)$$

where Y is the rate of economic growth.

In the first stage, the rate of growth T is slow because the technology level (T) is lower than that of wages (W) as explained in Figure 1. In the figure, the T curve is like a logistic curve with an increasing growth rate at first and then a decreasing rate. The W curve is S-shaped with the rate of increase decreasing at first because of underemployment and increasing at a later stage when labour becomes scarce. The low income countries fall in this stage which is to the left of point E in the figure. It is in the second stage from OY_1level onwards that the growth rate is fast increasing because T is fast increasing and is higher than W. The majority of LDCs of Southeast and East Asia and Latin America fall in this stage. Technology transfer increases the technology level and widens the gap between T and W, thereby increasing the rate of economic growth (Y). It is T_1-W_1. at OY_2 levelin the figure. After OY_2 level, the third stage begins in which economic growth slows down after maturity. The T curve is increasing at a decreasing rate and the W curve is rising at an increasing rate because of relatively scarcity of labour. This is the stage in which the developed countries are today.

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2. I am thankful to Mr. Nicholas Fernandes of University of Hong Kong for supplying me papers of Prof. Edward K.Y. Chen under whom he was working for his Ph. D. on Buruei's Economic Development. Mr. Fernandes was also getting guidance from the author.

5. To Fill Technological Gap. There exists a wide technological gap between the indigenous stock of technology and technology required for faster growth in the LDCs. This gap can be bridged by technology transfer from the developed countries. Modem technology supplements the available indigenous technology and also helps in modifying and adapting advanced technology in the LDCs. According to Prof. Kuznets, LDCs must import modern technology to accelerate their productive capacity in the short run because they, cannot wait until they themselves invent or modify the technology of advanced countries. But as they adopt modern technology, they must develop their indigenous technical skills by adapting modern technology in keeping with their factor endowments.

6. To Develop Basic and Key Industries and Infrastructure. The LDCs need technology transfer to develop basic and key industries and infrastructure. Such countries lack in basic and key industries and such infrastructure as transport, communications, power, etc. Their natural resources lie dormant and remain unutilised, underutilised or misutilised. This is because all these involve high risks, large capital, long gestation period and modem technology for their development. Thus technology transfer is required by the LDCs to build their infrastructure, establish new industries, tap natural resources and open new areas.

7. To Make LDCs Competitive. The LDCs require transfer of technology to make their economies competitive in the international market. These countries mostly export unprocessed products, raw materials and substandard articles. As a result, their products fetch low prices because their competitive power is weak in the world market. By technology transfer, they can protect their economic interests by making their goods competitive in the international market. This is possible by developing export-oriented and import-substitution industries through technology transfer.

8. To Solve Balance of Payments Problem. Transfer of technology is also needed by the LDCs to ease their balance of payments situation. When the transfer of technology brings capital, machinery, knowhow, experts, etc., there is a greater inflow of resources without little remittances abroad in the early stage of development. Repatriation of profits, royalties, etc. begins after the recipient firms become fully operational and break-even. Further, by helping in the establishment of export-oriented and import-substitution industries, the transfer of technology tends to increase exports and reduce imports, thereby improving the balance of payments position of the LDCs.

9. To Solve Socio-Economic Problems. Transfer of new technologies prove efficient in solving many of the pressing social and economic problems of the LDCs which retard their economic growth. For instance, the Green Revolution has shown how the use of modern science and technology can boost grain production and put an end to malnutrition and famine in overpopulated LDCs and even make them self-sufficient in the production of foodgrains.

10. To Save Time and Money. Moreover, the LDCs can make use of the already tested and existing benefits of modern technology without having to

traverse the difficult path through which the developed nations had to pass through to achieve the present high technological level, thereby saving their time and money.

Conclusion. The LDCs need technology transfer for their rapid and all round economic development. It is essential for increasing the productivity of men and machines, for building infrastructure, developing agriculture and industry so as to make them internationally competitive, for exploiting and making an optimal use of their natural resources, and for developing labour, organisational, administrative and entrepreneurial skills, etc. Thus technology transfer is *an engine of growth* for LDCs.

CHANNELS OF TECHNOLOGY TRANSFER

There are four channels or modes of technology transfer from one country to another and across enterprises. They are as follows:

1. Transfer of Knowledge. The transfer of technology takes place when knowledge about modem technologies is passed on through scientific exchange in the form of research journals, books and other published material.

2. Commercial Channels. Technology is also transferred through commercial channels on a bilateral basis from private firms, mostly MNCs to state-owned enterprises, and branches of MNCs operating in the LDCs. This is also known as intra-firm technology transfer which is in the following forms:

(*a*) turnkey projects;

(*b*) specialised services such as financial, managerial, engineering, construction, etc.

(*c*) “project packed” sales of technology which may include raw materials, machinery, equipment, spare parts, management, brand names, patents, trade marks, licensing, joint ventures, wholly owned subsidiaries, etc.;

(d) “process packed” sales of technology which include complete production processes or plants along with market survey, product-mix, drafts, designs, technical specifications, know-how, commissioning, supervision, and services

of experts for training local personnel;

(*e*) "technological package" or "simple direct" sales of technology which include "embodied" or outright sales of machinery and equipment or consulting services (disembodied) like managerial, marketing, including access to foreign markets, and other expertise; and

(*f*) "unpackaged" sales of technology or direct investment in the form of machinery, equipment, raw materials, processed products, commissioning, designing, licensing, training, management or supervision.

3. Government Channels. The transfer of technology also takes place through government channels in the form of technical assistance which is not related to the direct promotion of commercial goals. This is usually in the form of providing educational and training facilities to students and personnel of the LDCs in colleges and institutions in developed countries. Further, experts and advisors come to the LDCs to advise and train people in various fields of economic activity such as establishing steel plants, hydroelectric projects, oil exploration, and building other infrastructure.

4. International Organisations. Many international organisations under the aegis of the UN, the European Community, the Asian Development Bank, etc. promote the transfer of technology to the LDCs through training of their personnel, providing vocational training, conducting seminars and short-term courses, helping in research by providing necessary equipment, sending specialists and consultants to impart training in various fields, to evaluate natural and economic resources, etc. The transfer of technology through governments and international organisations are mostly in the form of aid.

Conclusion. Thus technology is transferred from developed to developing countries through a number of channels enumerated above. But out of them, the commercial channels are more effective, popular and important in contributing to the economic development of LDCs than the other channels, even though they create many problems for the LDCs.

PROBLEMS IN TECHNOLOGY TRANSFER

The problems in transfer of technology from the developed countries to LDCs

arise both from the suppliers and buyers of technologies. Problems arise from the supply side because the technological markets are mostly imperfect and occupied by the MNCs. On the demand side, the purchasers of technologies have weak bargaining power due to backwardness, urgency of importing technologies, and lack of information about the availability of appropriate technologies. Consequently, the suppliers exploit the purchasers of technologies. Given these two basic factors, problems relating to the transfer of technology are discussed as under:

1. Technological Dependence. When the MNCs or private firms enter into agreements with firms in the LDCs for the transfer of technologies, they restrict their right to use or change or transfer the technology according to their discretion or requirements. This leads to technological dependence.

2. High Costs. The sellers prefer to sell technologies in "project packages" which are tied to specific projects or products. The buyers are compelled to buy such technologies which require the purchase of raw materials, machines, spare parts and services of parent companies at costs much higher than those prevailing in the competitive world market. It is estimated that they are normally higher by 30-40 per cent.

3. Hinder Development of Local Entrepreneurship. Often, the MNCs transfer new technologies to their own branches in the LDCs. But these branches do not share the new technologies with local firms and use them for their own benefits. As a result, new technologies do not enter other spheres of national economies and thus reduce the opportunities for the development of local entrepreneurship.

4. Manipulate Prices. When the MNCs transfer technologies and operate their own branches in the LDCs, they manipulate the prices of their products to their own advantage and thus keep most of the gains to themselves. If restrictions are placed by the host country on the transfer of profits to the parent company, the MNCS use these profits in holding the majority shares of other companies, thereby spreading their economic strength in the country and preventing the growth of related industries locally.

5. Tax Evasion. At the time of technology transfer, the foreign firms insist on large tax concessions from the host country in the form of tax holiday,

repatriation of large percentage of profits, high royalties for the use of patented technology, high wages for the expertise, etc. As a result, they are able to avoid taxes and earn large profits.

When technology transfer is of the direct investment type, the MNCs which operate their branches in the LDCs resort to tax evasion through "transfer pricing". They are largely engaged in intra-firm trade by shipping goods from one industry to another or providing services from the parent office to all the branches in different countries. They charge arbitrary prices in such intra-firm transactions and manipulate their accounts so as to evade taxes in the host country.

6. Exploitation of Workers. When technology transfer is tied to the training of workers in new skills and trade in the host country, they are unable to shift to other industries. Thus the mobility of labour is restricted. As a result, such firms exploit the workers by forcing them to work for longer working hours. This causes psychological and nervous strains. If the workers are engaged in chemical and allied industries, they are liable to professional diseases.

7. Social Tensions. There are large wage differentials between workers trained in new technologies and workers engaged in local firms in the LDCs. Such wage differentials increase income inequalities. An elite class of workers is created which leads to a dual society and causes social tensions within the economy, thereby retarding growth.

8. Limited Labour Absorption. Developed countries mostly transfer capital-intensive technology to the LDCs which has limited labour absorption capacity. Such a technology fails to solve the acute problem of unemployment in LDCs.

9. Worsens Balance of Payments. Technology transfer leads to the repatriation of large sums of profits, royalties, fees, etc. to the supplier countries. This worsens the balance of payments situation of LDCs after the initial period of inflow of capital is over. If technology transfer is of the direct investment type, then the repayment of interest and principal will create the debt problem which will further worsen the balance of payments situation of the LDCs.

10. Outmoded Technology. Often the MNCs export outmoded and discarded

technology to the LDCs. Such a technology is somewhat cheaper and of a lower capital intensity, but it entails high costs in terms of repeated breakdowns and constant repairs. In the absence of the availability of spare parts in the supplier country, such technologies become useless and bring huge losses to the purchasers in the LDCs.

APPROPRIATE PACKAGE OF TECHNOLOGY TRANSFER

In the light of the problems faced by the LDCs in technology transfer, the question arises what is the most appropriate package of technology transfer for them? Technology transfer as a package consists of capital, technology, managerial and marketing skills and information services rather than just the flow of financial resources.

The most appropriate package of technology transfer should be one that contributes to increasing the level of technology, generating employment, reducing inequalities and increasing the growth rate in the LDCs. It is generally argued that the technologies transferred to the LDCs are very capital-intensive for the given factor endowments and factor market conditions prevailing in them. But the developing countries have different factor endowments and factor market conditions. They are also in different stages of growth. It is, therefore, better to have an eclectic approach for explaining the most appropriate package of technology transfer to the LDCs. Prof Edward Chen applies Dunning's Eclectic Theory to explain the most appropriate technology transfer to the LDCs.

The first factor in the eclectic approach is the product to be produced. Prof. Vernon' s Product Cycle Hypothesis[3] suggests that the production of a product goes through three distinct stages: the new product, the maturing product and the standardised product. In the new and maturing product stages, the production processes are relatively more capital-intensive and technology-intensive than in the standardised product stage. So firms producing in these two stages transfer their technologies aiming at the domestic market of the LDCs. They, therefore, transfer capital-intensive technologies to the LDCs. When the product becomes standardised, the production process becomes more labour-intensive and skill-intensive. In this stage, firms transferring their technologies aim at exploiting the lower cost structure of the LDCs. They

therefore, transfer labour-intensive technologies to LDCs. Such technologies are used in the LDCs to manufacture for exports to the technology-exporting countries or to other developed and developing countries.

It can be concluded on the basis of the Product Cycle Hypothesis that for the LDCs producing for exports, the more appropriate technology transfer should he labour-intensive. This is because the production of standardised products for exports is more in line with their comparative advantage, and technology used is more appropriate to the local conditions. This has been the case with many South East and East Asian countries.

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3. R. Vernon, "International Investment and International Trade in the Product Cycle," *Q.J.E.*, May 1966. For details of the theory, refer to my *International Economics*, 6/e, 2009.

The LDCs engaged in the production of products at the maturing stage primarily for the domestic market should transfer basically capital-intensive and technology-intensive techniques from abroad. Such activities include mining and the manufacture of automobiles, machine tools, electrical equipment and a variety of consumer goods. This has been the case in many countries of Latin America and Africa. This is because domestic market-oriented firms do not have comparative advantages over the foreign suppliers of such products.

Another factor that governs the most appropriate technology transfer to the LDCs is the *stage of economic development* of an LDC. Countries with different levels of development exhibit different characteristics in terms of: (*i*)the availability of skilled labour and managerial staff; (ii) the range of available techniques; and (*iii*)the extent of factor-price distortions. The availability of skilled labour and managerial staff is essential for the effective supervision of workers for the use of labour-intensive techniques. If the extent of factor price distortions is small and the range of available techniques is large, a more appropriate package of technology transfer to the LDCs in the form of capital, technology, managerial and marketing skills and information technology is possible. But in those LDCs where various institutional barriers in factor markets exist in the form of labour codes and protectionist policies, they result in serious factor distortions and structural characteristics pointing towards low level of development.

Last but not the least, an LDC should import such a package of technology that is easy to learn, diffuse and assimilate in keeping with their *factor endowments* and *technological capabilities*. The acquisition of technological capability is the most important factor to overcome the problems faced by an LDC. Technology capability is the capacity "to produce more efficiently, to establish better production facilities and to use the experience gained in production and investment to adapt and improve the technology in use. The main way of doing this is to build on what can be obtained from abroad while developing local capabilities in areas where it takes the most sense".[4] In other words, technological capability is meant to select, diffuse and build on established technology from abroad. It can be promoted by government actions in providing education, training and R & D facilities, fostering internal and external competition and encouraging the development of information services and quality control in the LDCs. The right use of technology transfer in the LDCs depends on the existence of technological capabilities.

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4. C.J. Dahlman, B. Ross-Larsen, and L.E. Westphal, "Managing Technological Development", *World Development*, June 1987.

CHAPTER

Investment Criteria in Economic Development

INTRODUCTION

The problem of investment criteria involves the principles underlying the allocation of scarce investment resources in a rational manner so as to maximise the national income in an underdeveloped economy. It is a commonly known fact that private enterprise in such economies is motivated by profit maximisation. Very often private investment decisions are for projects that are not conducive to economic development. It is, therefore, felt that only a public authority can make decisions to allocate scarce investment resources and to influence the direction of private investment towards development-oriented projects. For this, the choice before the public authorities is between techniques of a higher or lower capital intensity. Towards this end, economists have propounded a number of investment criteria which are discussed below.

THE CAPITAL-TURNOVER CRITERION

The capital turnover criterion is known by various names viz., the rate of

turnover criterion, the maximisation of output per unit of capital criterion or the ratio of output to capital criterion (minimum capital intensity or minimum capital-output ratio criterion). This criterion is attributed to J.J. Polak and N.S. Buchanan.[2] The logic involved is that since capital is scarce in underdeveloped countries, that technique should be chosen which yields the maximum output per unit of capital employed. In other words, for maximising output, investment projects with a high rate of capital turnover (i.e., of a low capital output ratio) should be selected. Quick-yielding projects with a low capital intensity make it possible for scarce capital resources to be realized soon enough for reinvestment into other projects. Such projects also provide maximum employment per resource in underdeveloped countries. Here the capital employment absorption criterion merges into the capital turnover criterion.[3] This criterion is particularly useful, according to Chenery, in choosing among projects within a given sector.

1.This appeared as an article in a slightly modified form in *AICC Economic Review*, January 1969. Published with the kind permission of the Editor.

Its Limitations. There are, however, certain limitations of this criterion.

First, it ignores the element of time. Quick-yielding projects having a low capital-output ratio in the short run may have a high ratio in the long run.[4]

Secondly, this criterion ignores the supplementary benefits flowing from an investment project. It is possible that projects with a high capital-output ratio may confer certain supplementary benefits on the economy thereby outweighing extra costs involved in them. On this count, notes a UN study, a project with a high capital-output ratio should not necessarily be accorded a lower priority.[5]

Thirdly, in certain industries like agriculture, a low capital-output ratio may appear outwardly. If working capital like fertilisers is also included in the fixed capital investment, the ratio may in fact be high.

Fourthly, the higher the rate of turnover, the higher may be the rate of depreciation of capital and rate of output may hot be high. Therefore. Dr. K.N. Prasad suggests the net rate of turnover criterion instead.[6]

Fifthly, the maximisation of employment argument implied in this concept may hold good only in the short run. A capital-intensive project may absorb little labour to start with, but may maximise the amount of labour per unit of investment in the long run.

Sixthly, it does not necessarily follow that with increased employment there will be an addition to total output. Labour-intensive and capital-saving investments may keep productivity of labour low as usual, without making any addition to total output.

Seventhly, the use of labour-intensive techniques may even reduce output thus necessitating a greater use of capital thereby raising the capital-output ratio.

Lastly, such techniques often produce sub-standard products. Such products are often subsidised by the government and entail high social costs, e.g., the production of cotton textiles with handlooms.

Conclusion. The capital turnover criterion is thus circumscribed by a number of factors. No doubt common sense demands that in the face of abundant labour and scarce capital in underdeveloped economies projects of a low capital intensity should be undertaken but the undeniable fact remains that for building up the socio-economic infrastructure and for accelerating the rate of economic development, project with a high capital intensity are also a must. India has been judiciously following this dual investment policy in her plans for economic development.

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2. J.J. Polak, Balance of Payments Problems of Countries Reconstructing with the help of foreign Loans." Quarterly Journal of Economics, February 1943 and N.S. Buchanan, *International and Domestic Welfare*, New York, 1945.

3. Nurkse's doctrine of Concealed Saving Potential is a variant of the Capital Absorption Criterion,R. Nurkse, *Problems of Capital Formation in Underdeveloped Countries*. Ch. II.

4. Merits of a high capital-output ratio are discussed in detail above.

5. UN, *Economic Bulletin for Asia and Far East*, June, 1961, pp. 30-33.

6. K.N. Prasad, *Technological Choice Under Development Planning*, 1963.

THE SOCIAL MARGINAL PRODUCTIVITY CRITERION

The social marginal productivity (SMP) criterion was first put forward by A.E. Kahn and later Hollis B. Chenery[7] improved upon it. It is based on the conventional marginal productivity approach. As more and more capital is employed in any project in combination with given amounts of other inputs, its marginal product will after a time start falling till the marginal productivity of capital in different uses is equalised. The aim is to allocate limited investment resources in such a way as to maximise the national output. In other words, they should be utilised in the most productive projects. Kahn states that this criterion takes "into account the total net contribution of the marginal unit to national product and not merely that portion of contribution (or of its costs) which may accrue to the private investor." Thus it is applicable to the economy as a whole and not to individual investment projects.

Chenery evolves a formula for the quantitative measurement of the SMP concept. He ranks investment projects according to their social value and studies their effects on national income, balance of payments and the cost of domestic and imported materials used therein. The selection of projects depends on their rank, and their number on their cost and funds at their disposal.

Taking the balance of payments to be in equilibrium, the Chenery equation is:

$$\text{SMP} = \frac{X + E - L - M - O}{K}$$

where, X represents increased market value of the output, E the added value of output due to external net economies, L cost of labour, M cost of materials, O overhead costs including depreciation, and K is capital funds invested. The equation can be simplified as $(V–C)/K$ where, V the social value added domestically equals $(X+E)$ and C the total cost of factors equals $(L+M+O)$.

Since in underdeveloped countries foreign exchange is more valuable than domestic currency, there is a large difference between the actual and official value of the foreign currency in terms of the local currency. Chenery represents this difference by r. A zero r means equilibrium in the balance of payments, a positive r represents a surplus and a negative r, a deficit in the balance of payments of the country. Accordingly, the refined formulation is:

$$\text{SMP} = \frac{V - C}{K} + \frac{r(aB1 + B2)}{K}$$

The other elements being the same, *aB1* is the annual authorised impact on the balance of payments of servicing initial borrowings from abroad and *B2* the annual effect of the project's operation on the balance of payments. If *B* is negative, it means an import and if it is positive it is an export. To simplify the formula still further *r*(*aB1+B2*) is represented by *Br*, the combined balance of payments effect and the final formula is:

$$\text{SMP} = \frac{V - C}{K} + \frac{Br}{K}$$

With the help of this formula Chenery has calculated the SMP of a number of investment projects in Italy and Greece. According to him the use of this formula in full may help in improving upon the method of using funds in a piecemeal manner on major projects.

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7. A.E. Kahn, "Investment Criteria in Development Programmes." *Quarterly Journal of Economics*, February, 1951, pp. 38-61 and Chenery, "The Application of Investment Criteria," *Quarterly Journal of Economics*, February, 1963, pp. 76-96.

Its Limitations. Despite this, the practical usefulness of the SMP criterion is limited due to a number of considerations.

First, it is not correct to say that the marginal productivity of capital is exactly equal in all uses. It can be at the most nearly equal, for investment may be either too large or too small due to technical reasons.

Secondly, marginal productivity of capital in the case of different projects is equalised on the basis of a particular technology which may not necessitate the reallocation of investible funds. But it might be useful to devote larger doses of capital to particular projects if it leads to the use of a better technology.

Thirdly, the SMP criterion considers only the effects of the present. Factor productivity in different uses depends on the relationship between costs and prices of the products produced and these in turn depend upon supply and demand conditions. In the short run, resources are adjusted to prevailing supply and demand conditions, while in the long run they are themselves

influenced by present investments. Similarly, cost conditions may also be changed over time with the acquisition of more knowledge, skill and experience by entrepreneur and workers. Thus, it is difficult to calculate the productivity of resources when the time period is long.

Fourthly, the SMP criterion is vague and indefinite. For it is difficult to have a correct assessment of the benefits and costs of different projects both in the present and future. Market prices are not a correct guide to resource allocation. There is wide disparity in underdeveloped countries between the equilibrium and the market rates of interest, wages and foreign exchange. Likewise the benefits accruing from social investments like education and public health services can at best be assigned arbitrary monetary valuations. There are also idle resources like the underemployed and the unemployed manpower whose market value is not capable of measurement. Chenery himself admits that such imperfections in the market forces will " greatly reduce the social value of investment unless an attempt is made to offset them." Therefore, to facilitate the calculation of social values in these and other cases, **Chenery**, **Frisch** and **Tinbergen** have suggested the use of "shadow" or "accounting" prices reflecting the intrinsic value of products and factors. Corresponding to the concept of shadow prices is the concept of "shadow cost" which is used to calculate the cost of a particular project to society. An ILO study suggests that these shadow prices and costs and not the market prices and costs, if any, should be used in ranking investment projects and determining which are worth undertaking and which are not.[8]

Finally, one of the major defects of the SMP criterion is that it is concerned with once-for-all effect of investment on the national income and neglects the multiplier effect of present investment on future income. Moreover, it does not consider the indirect effect of the present investment on population, saving and consumption in future.[9] It is possible that the present investment may increase the national income but may make the distribution of income unequal. Similarly, investment in some projects may raise the per capita consumption in the present as compared with other projects which may raise it over the long period. Therefore, the SMP criterion is at best a value concept.

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8. Some Aspects of Investment Policy in Underdeveloped Countries,' *International Labour Review,* May 1958.

9. UN, *Economic Bulletin for Asia and Far East,* June 1961, *op. cit.*

THE REINVESTMENT CRITERION

The reinvestment criterion is advanced by Galenson and Leibenstein.[10] It is also known as the rate of surplus criterion or the marginal per capita investment quotient. The latter is defined as the "net productivity per worker minus consumption per worker." Galenson and Leibenstein emphasize the maximisation of per capita output in future rather than in the present. This is possible when the rate of savings is maximised leading to reinvestment of income. Assuming that national income is divided into wages and profits, the former are spent on consumption and the latter are saved for the purpose of investment. The larger the volume of profits, the higher will be rate of savings, as a result the larger will be the amount of capital available per head and the higher will be the growth rate of output which will lead to increased output per head in future. In the early phase of development a "critical minimum effort" is required on the part of underdeveloped countries to increase the proportion of profits to national income and to restrict consumption per head. This would lead to larger savings and larger reinvestible surplus. Given the quality and quantity of labour force, it is the capital-labour ratio that determines per capita output. Galenson and Leibenstein use the following formula to determine the rate of investible surplus (r)

$$r = \frac{p - e.w.}{c}$$

where, p is the product per machine, e the number of men per machine, w real wage rate, and c the cost of machine, r can be increased by raising p and depressing $e.w$ in proportion to c.

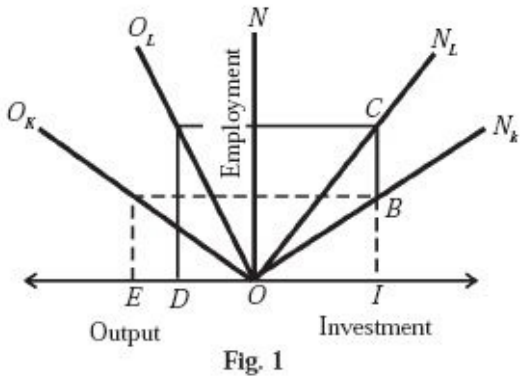

Fig. 1

In order to raise the proportion of capital to labour, the per capita output potential and the per capita investible surplus, Galenson and Leibenstein favour capital intensive techniques even in those countries were capital is scarce and labour abundant. Production processes having a high ratio of capital to labour result in a large share of income going

into profits and a small share into wages. Thus a large proportion of the initial income is available for investment through profits.

The larger the profits, the higher will be the savings. As a result, more capital will be available for investment and the greater will be the increase in output. This is illustrated in Fig. 1 wherein the north-east quadrant the relationship between new investment and resulting changes in employment *N* is represented. N_K shows this relationship when a capital intensive technique is used, and N_L when a labour-intensive technique is used. The north-west quadrant represents the relationship between employment and output. O_K shows this relationship with a capital-intensive technique, and O_L when a labour-intensive technique is used. Assuming the same amount of new investment *OI*, the capital-intensive technique creates *IB* employment while the labour-intensive technique creates *IC* employment. But the labour-intensive technique creates only *OD* output while the capital-intensive technique creates larger output *OE*. Thus the capital-intensive technique creates less employment but more output while the labour-intensive technique creates more employment but less output.

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10. W. Galenson and H. Leibenstein, "Investment Criteria, Productivity and Economic Development," *Quarterly Journal of Economics*, August 1955, pp. 342-70. Also H. Leibenstein, *Economic Backwardness and Economic Development*, Ch. XI and comments by H. Neissen, J. Moses and A. Hirschman in November 1965, 1 February, 1957 and August 1968 issues respectively of the *Quarterly Journal of Economics.*

Urbanisation following industrialization through the establishment of capital-intensive industries will affect a number of other social and economic factors including population growth. Further, capital-intensive production processes imply a long life of capital goods. Therefore, a smaller proportion of the gross investment resources will be required for replacement of worn out capital goods and a larger proportion is available for future capital formation. Another important argument in favour of such techniques is that though they absorb less labour in the short run, yet they are capable of absorbing more labour in the future as the growth rate will be faster in the long run.

Its Criticism. There are, however, certain objections to this criterion:

First, the reinvestment quotient is based on the assumption that consumption remains constant overtime. But this is untenable. For as pointed by A.K. Sen,

with additional employment the total consumption of the community is likely to increase and unless the increase in output as a result of additional employment is greater than the increase in consumption resulting from it, the volume of investible surplus will fall. This will adversely effect the growth rate of the economy.[11]

Secondly, this criterion rests on the assumption that whatever is received as wages is spent on consumption and whatever is not paid to labour is reinvested. In fact, there are likely to be leakages in the wage-stream and profit-stream flowing into consumption and investment channels respectively. With the increase in real total output, workers might feel better off than before even at the same wage rate and may save something. The doctrine makes no allowance for capital depreciation either, which is sure to reduce the reinvestible surplus. Thus, the authors fail to discuss the problems which may ensure wages to be spent exclusively on consumption and thereafter the surplus to be reinvested.

Thirdly, it goes against the principle of marginal productivity of capital. As the amount of capital is increased in successive doses after a point its productivity starts declining. This implies a fall in output per capita and in the reinvestment quotient.

Fourthly, the contention that highly capital-intensive processes have a large reinvestment potential does not appear to be correct. A highly capital-intensive industry like the iron and steel will not yield output until several years have elapsed. On the other hand, modern small enterprises possess a high reinvestment coefficient and thus use more capital and more labour per unit of output than large factories.[12]

Fifthly, the concentration upon large scale capital-intensive industries is beset with a number of practical difficulties in underdeveloped countries. Due to lack of skilled labour and entrepreneurial ability, the efficient management of large undertakings is difficult. Further, due to non-availability of sufficient capital for small enterprises, consumer goods industries are unable to develop, thereby leading to inflationary pressures in the economy.

Sixthly, the investment criterion is lopsided, for it does not study the effect of balance of payments on investment. In an underdeveloped economy there is an

acute scarcity of capital goods which have to be imported and they worsen the already tight balance of payments position.

Seventhly, Otto Eckestein is of the view that instead of depending on the reinvestment criterion for planned investment, it may be better to use fiscal measures to attain an income distribution which will yield sufficient savings for the purpose of investment.

Eighthly, the reinvestment criterion neglects the importance of consumption, rather it advocates its curtailment. But current consumption may be more important than future consumption and the reinvestible surplus may have to be cut down in the interest of the community.[13] Neglecting the consumer goods sector in favour of the capital goods sector is wrought with serious consequences both for the economy and for the state. It is bound to lead to scarcity of essential commodities and to inflation and social unrest in an underdeveloped economy wedded to democracy.

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11. A.K. Sen, "Some Notes on the Choice of Capital Intensity in Development Planning," *Quarterly Journal of Economics,* November, 1967.

12. P.N. Dhar and H.F. Lydall, *op. cit.*

13. O. Eckestein, "Investment Criteria for Economic Development and the Theory of Inter temporal Welfare Economics." *Quarterly Journal of Economics,* February, 1957.

Ninthly, the use of the reinvestment criterion perpetuates the problem of unequal distribution of income in such economies. There is a greater degree of unequal distribution of income between the wage earners and the capitalists and between those who obtain immediate employment and those who are left unabsorbed.[14]

Lastly, this criterion does not reckon those cases of development planning in which the present income is valued more than the future income for facilitating the expansion of the capital goods sector and in which a lower growth rate but a higher rate of income in the immediate future is to be preferred.[15]

Conclusion. Despite these limitations, the reinvestment criterion is useful as a first approximation towards accelerating the rate of income growth in an underdeveloped economy. It is more realistic than the social marginal

productivity criterion, for it takes into consideration the effects of population growth on the rate of investment in future.

THE TIME SERIES CRITERION

A.K. Sen has put forward the "time series" criterion.[16] The criterion seeks to maximise output within a given period of time. Given the capital-output ratio and the rate of savings, the time-path of (say) two techniques (capital-intensive and labour-intensive) can be drawn and it can be found out which of the techniques yields the highest returns over the time-horizon. Suppose that there are two projects *H* (capital-intensive) and *L* (labour-intensive) and time horizon is ten years, at the end of which total returns in each case are 100 million. This is shown in Table 1.

Table 1 : Time Series

Period (in year)	*Project I (Capital-intensive) H (Returns in millions)*	*Project II (Labour-intensive) L (Returns in millions)*
1	4.0	6.0
2	5.0	7.0
3	6.0	8.0
4	7.5	9.0 (b)
5	9.0	10.0
6	10.5	11.0
7	12.0	11.5
8	13.5	12.0
9	15.0 (a)	12.5
10	17.5	13.0
	100.0	100.0

(a) excess over L 58.0 - 49.0 = 9.0

(b) excess over H 51.0 - 42.0 = 9.0

14. H.Myint, *The Economics of Developing Countries,* 1967, p. 139.

15. K.N. Prasad, *op. cit.*

16. A.K Sen, "Some Notes on the Choice of Capital Intensity in Development Planning." *Quarterly Journal of Economics,* November, 1967. Also his book *Choice of Techniques.*, Ch. II, V, VII and VIII.

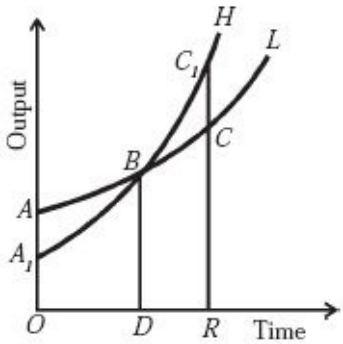

Fig. 2

The returns of the *H* project are less (42 million) in comparison to those of the project *L* (51 million) over the first six years while in the remaining four years the returns of the *H* project rise more than that of the *L* project. The returns rise from 42m to 58m in the case of project *H* and fall from 51m to 49m in project *L*. Since the total returns are the same (*i.e.*, 100 million) from both the projects, the overall position is one of indifference. The important point is as to whether the initial loss in output by adopting a capital-intensive project is recovered within the time period of ten years or not. The time taken by the capital-intensive technique to overcome its initial deficiency in output over the labour-intensive technique is called by Sen "the period of recovery". This is explained with the help of the diagram above reproduced from Sen.

[*H* and *L* curves show the flow of real output during a given time horizon with two techniques. Technique *H* (see Table 1) gives lower output in the beginning but a higher rate of growth than technique *L*.Up to the time period *D*,technique *L* gives more output over technique *H*. At the point of time *R*, technique *H* makes up this deficiencey when it give CBC_1 more output over technique *L*. The period *OR* is the period of recovery which makes the area $ABA_1 = CBC_t$ area].

Thus for any pair of techniques a period of recovery can be found out. In choosing between the techniques the period of recovery should be compared with the period we are ready to take into account. If it is found that the period of recovery is longer, that is, if within the time-horizon, the loss in output, by adopting technique *H* is not recovered by the excess of output we should choose technique *L*. If reverse is the case, technique *H* may be chosen. To the extent real wages are within control and the taxation system is capable of providing any rate of saving, the quantitative importance of the conflict between the maximisation of immediate output and the future growth rate is less. But so long as there is some conflict between the present and the future, the choice will depend on the time discounted use. To say, therefore, according

to Prof. Sen, "that over-populated countries should always prefer labour-intensive methods conceals an implicit preference for present over future, and represents a very short planning horizon. On the longer planning horizon, the more we calculate the future rate of growth over the present level of consumption and employment, the more we should favour capital intensive methods which are capable of yielding a larger surplus of output over, wage costs for a given capital outlay and so make possible a higher rate of reinvestment for the future."

This criterion by taking into consideration the element of time for determining production techniques in an underdeveloped economy becomes more realistic than the other criteria discussed above.

Its Limitations. But Sen himself points out three limitations of his concept:

First, the taking up of a particular time-horizon, say of ten years, is arbitrary.

Secondly, it is not possible to derive the time series for all times to come. Therefore, the planning period has to be definitely fixed. But this creates some serious problems. When the time limit is about to end, labour-intensive technique might be selected in order to inflate the quality of output and thus capital formation is neglected. As a result, investment will fructify after the time limit and it might not be possible to compensate for the depreciation of machinery.

Thirdly, factors like technological change, wage rate, propensity to consume, etc., on which the study of time series depends may all be changing and make the forecasting of future investment and output not only difficult but also erroneous.

Lastly, Prof. Prasad is, however, of the view that there is nothing novel about this criterion. If the period of recovery is very short, this criterion in practice becomes the net rate of turnover criterion and if the period of recovery is very long, it corresponds to the reinvestment criterion. In the end we are left with the question, what criterion is there for the choice of a time period?"[17]

CONCLUSION

The various investment criteria discussed above are not different in their ultimate objective, that of the maximisation of national output. Only the approach routes differ. The different components of national income (consumption, saving and investment) are used by economists to maximise the total output by giving more or less importance to one or the other. Some investment criteria aim at maximising total output at a point of time while others over a period of time. But all criteria are incomplete because they neglect the influence of such factors as population growth, tastes, technical progress, market conditions, distribution of income, price changes, balance of payments and social and cultural conditions on the level of investment in one way or the other. Contrarywise, they also fail to study the impact of investment on these factors. Even the use of input-output technique and the concept of shadow prices and costs have failed to solve this problem satisfactorily. But despite these apparent theoretical and practical limitations, the various investment criteria are being increasingly made use of in the programming of resource allocation in almost all the developing countries of world including India. It is, however, essential that they must be in keeping with the social and economic objectives of the developing country.

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17. K.N. Prasad, *op. cit.*

CHAPTER

Economic Planning and Price Mechanism

INTRODUCTION

The price mechanism[1] is a system of economic organisation in which each individual in his capacity as a consumer, producer and resource owner is engaged in economic activity with a large measure of freedom. It is related to a free market economy, where the factors of production are privately owned. Individuals are free to choose any occupation, to buy and sell goods and services from anyone and to anyone based on mutual benefit at prices determined by market forces. Ultimately the price mechanism leads to the maximization of efficiency and output through the equilibriating forces of demand and supply for goods and services. But the analysis of the price mechanism is based on certain restrictive assumptions: the existence of perfect competition of the product and factor markets; perfect knowledge about present and future price and non-price variables; the prevalence of constant returns to scale; the absence of external economies; perfect divisibility of capital; no changes in population and in the tastes, habits and fashions of consumers; and the maximization of profits by producers. Our main task is to

find out the relevance of the price mechanism in the context of economic planning.

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1. For detailed study of the role of Price Mechanism refer to author's Advanced Economic Theory, Ch. 5.

PRICE MECHANISM IN A PLANNED ECONOMY

The price mechanism is a distinguishing feature of a free market economy and hence it is contended that the price mechanism has little relevance in a planned economy. Under economic planning the various elements of the price mechanism—costs, prices and profits—are all planned and calculated by the planning authority in accordance with the targets of the plan. Thus in a planned economy rational economic calculation is impossible because unlike a free market economy the price mechanism is regulated and controlled. The various assumptions under which the price system works do not hold good under planning. This matter had been hotly debated from the beginning of the twenties. **Prof. Ludvig von Mises** was the first to declare that economic planning was doomed to failure in the absence of a free market mechanism. He was supported by **Hayek** and **Robbins** who held that to assign rational valuations to the means of production without private property might be logically conceivable, but it was practically impossible. **Prof. Robbins** wrote: "On paper we can conceive this problem to be solved by a series of mathematical calculations, but in practice it is quite unworkable. It would necessitate the drawing up of millions of statistical tables based on many more millions of individual computations. By the time equations were solved, the information on which they were based would have become obsolete and they would need to be calculated again." Thus the price mechanism would be a farce under economic planning.

On the other hand, Taylor, Lerner, Lange and many others have shown the working of the price mechanism under economic planning. According to **Oskar Lange**, "The actual capitalist system is not one of perfect competition, it is one where oligopoly and monopolistic competition, prevail. This adds a much more powerful argument to the economists for economic planning,"[2] and the price mechanism can be changed to meet requirements of the national plan. He points out that Mises' failure to recognise a rational system under economic planning stems from his confusion regarding the true nature of

prices in a socialist society. Prices may be determined by independent buyers and sellers or they may be "an index of terms on which alternatives are offered". Mises errors in assuming that prices can be determined only in the former sense.

Lange, therefore, does not agree that in the absence of a competitive market there is no practical method of discovering the right prices. He agrees with Taylor and asserts that the method of 'trial and error' for determining accounting prices under a planned economy would need the solution of only those equations which relate to the consumers and the managers of production. The rational allocation of resources under economic planning in the light of a competitive market requires the satisfaction of three conditions of equilibrium.

First, each producer and consumer must adjust his selling and buying in such a manner that he cannot add to either his income or his satisfactions. This is the "subjective condition" of equilibrium.

Secondly, each price must be such that the total supply and demand for each commodity are equal. This is the "objective condition" of equilibrium.

Thirdly, the income of consumers must equal their receipts from selling productive services plus profits. These three conditions are fulfilled by the "parametric function of prices" whereby each individual tries to adjust himself to the actual market price through the process of trial and error. "The process of trial and error goes on until the objective condition of equilibrium is satisfied and equilibrium finally reached. Actually, it is historically given prices which serve as a basis, for the process of successive trial." For the satisfaction of these subjective and objective conditions in a planned economy, the planning authority should lay down two rules for the guidance of plant managers:

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2. *On the Economic Theory of Socialism*. Italics mine.

(*i*) each manager should combine productive goods and services in such a manner that the average cost of producing a given output is the minimum; and

(ii) each manager should choose that scale of output which equalises marginal cost to prices. In a planned economy raw materials, machines and

other inputs are sold by public enterprises at prices which are equal to their marginal cost of production. So pricing in a planned economy is based on marginal-cost pricing like that in a capitalist economy. If the price or marginal cost of commodity is above the average cost of production, the plant managers will earn profits, and if it is below the average cost of production they will incur losses. In the former case, the industry would expand and in the latter case the industry would cut down production, and ultimately a position of equilibrium would be reached where price equals both average and marginal cost of production. Thus as pointed out by Lange, "The rules of consistency of decision and of efficiency in carrying them out are in socialist economy exactly the same as those that govern the actual behaviour of entrepreneurs in a purely competitive market."

But how can the planning authority find out the equilibrium market and accounting prices? Starting from historically given prices, it can instruct the plant managers to regard them as correct prices. If they are wrong, surpluses or shortages will emerge. Prices will be readjusted accordingly. This process will continue till the equilibrium position is reached. This leads to the rational allocation of resources and this is how price mechanism operates under economic planning. According to Lange, "This trial and error procedure would or at least could, work much better in a socialist economy than in a competitive market. For the Central Planning Board has a much wider knowledge of what is going on in the whole economic system than any private entrepreneur can ever have, and consequently, may be able to reach the right equilibrium prices by a much shorter series by successive trials than a competitive market actually does.

Thus, it is wrong to say that the price mechanism has no relevance in a planned economy. Rather, it works better in a planned economy than in a capitalist economy. The former is able to minimize the malallocation and wastage of resources associated with the working of the price mechanism under the latter. The planning authority being better equipped in locating mistakes, price-output fluctuations and in rectifying them, the economy is able to secure optimum utilisation and production of resources. Moreover, a planned economy brings about an optimum income distribution in the society. The price mechanism helps in achieving all this under economic planning in two ways.

First, it serves as a basis of accounting—a means to evaluate and compare cost

of production and output based on accounting prices and costs.

Secondly, it acts as an incentive to the people to do things in accordance with plan targets.

Thus the role of the price mechanism in economic planning lies in assuring the maximum productive efficiency of the economy through proper cost accounting and in providing sufficient incentives to the people.

PRICE MECHANISM IN AN UNDERDEVELOPED ECONOMY

The price mechanism being closely associated with free market developed economies does not work properly in underdeveloped economies. There is little dispute over this. But economists differ over the role of the price mechanism under development planning. There is the view that the price mechanism should be allowed to operate in the interests of efficient resources allocation and for providing incentives to the people. The majority view holds that the price system is ineffective, unreliable and irrelevant for the solution of the complex problems faced by underdeveloped countries. The state should, therefore, assume control over the market system and change it in accordance with the targets of the national plan. It should use development planning to improve and strengthen the market mechanism rather than supplant it with overall controls.

According to the first view, a properly functioning market system tends to stimulate both economic efficiency and economic growth in various ways. The availability of a variety of goods through the market stimulates the consumer to work harder in order to increase his income. The market system provides an incentive to entrepreneurs to innovate and invent to bring about technological improvements. Thus it leads to the accumulation of both human and physical capital. People acquire the critical skills in order to earn a higher reward and accumulate physical capital to earn higher profits. Besides, the price mechanism does all this automatically without requiring much of administrative interference. As an administrative instrument it is relatively cheap to operate in comparison with the costs and difficulties of controls under planning.

Economists are, however, sceptical about reliance on the price mechanism to

stimulate rapid economic development in under developed countries. The price mechanism is in a rudimentary form in such economies. It is too weak to bring about necessary changes required for rapid development. If such economies are left free to market forces they may lead to wide fluctuations and keep them stagnant.

Investment decisions cannot, therefore, be left to the free working of the market forces. There are various reasons why the price mechanism does not function properly in underdeveloped countries.

First, is the inelastic supply of products. When the demand for a product increases, its supply is unresponsive. The reasons are the small size of markets, lack of the means of transport and communication, lack of capital, intermediate goods and personnel with entrepreneurial, managerial and labour skills. Moreover, a decrease in price does not induce increases in demand for a given product because of the low level of income. Under the circumstances, producers in under developed countries know that even if they try to produce more at a price which seems attractive, they will saturate the market, the price will fall and they will lose. Thus the price mechanism performs poorly in such economies due to lack of social and economic overhead capital, intermediate goods and the small size of markets.

Second, the price mechanism works imperfectly because of the ignorance and unfamiliarity with market mechanism in such economies. A large part of the economy comprises the non-monetised sector where people are engaged in barter trade. They are not aware of the working of the market system. As a result, the price mechanism is not able to bring about an efficient resources allocation. Further, certain institutional factors are responsible for bringing about price distortions and retard the smooth operation of the price mechanism. The product, factor, money and capital market are not organised properly. Mostly peasants produce for subsistence and even when the marketable surplus is available it cannot be sold at remunerative prices due to lack of market organisation and intelligence. Trade in agricultural products is concentrated into the hands of a few intermediaries which is more akin to monopoly rather than perfect competition. In the factor market, wages are much lower in the non-organised agricultural sector while they are even higher than the opportunity cost of labour in the industrial sector where labour is organised in strong unions. Labour in these two categories assumes the

nature of non-competing groups because the former is unskilled and the latter is skilled. In the money market, the market rate of interest is much higher than the bank rate. Rather, it varies over a wide range. It is very high in the rural sector where sufficient credit facilities are not available and the farmers have to depend upon the moneylender who enjoys a sort of monopoly. Where credit facilities are provided by the government in certain cases to agriculturists and small businesses for specific purposes, the rate of interest is modest. The capital market is unorganised and scattered which makes the transference of funds to productive channels difficult. Thus, due to distortions of the product, factor, money and capital markets the price mechanism does not operate properly in under-developed countries.

Again underdeveloped countries are not free market economies. Here the government intervention is inevitable to push them off the dead centre of economic activity which obstructs the working of the price mechanism. The prices of products are controlled and regulated to adjust supplies to demand in order to avoid inflationary pressure. The government also fixes minimum wages in the case of sweated labour. Infant industries are provided protection through subsidies and import restrictions. So less efficient firms operate at higher costs and losses. Even consumers are required to pay higher price due to import restrictions on commodities. Certain enterprises are run as public undertakings whose commodity prices are fixed by the state. So the state plays a major role in making the price-mechanism inoperative in underdeveloped countries.

Besides the market system leads to inequalities of income and wealth and the concentration of economic power in the hands of a few people. There also arise divergencies between social and private returns. Since the governments of underdeveloped countries aim at the reduction of inequalities of income and wealth, they put impediments on the working of the price mechanism.

The above factors lead to the obvious conclusion that the price mechanism itself cannot bring about an equilibrium between aggregate demand and aggregate supply. It is unable to overcome structural rigidities and break the vicious circles operating in the underdeveloped countries. And finally, individual investment decisions cannot be relied to mobilise and utilise efficiently the available resources for accelerated development of the economy. As aptly put by Prof. Galbraith, “The market cannot reach forward to

take great strides when these are called for. As it cannot put a man in space so it cannot bring quickly into existence a steel industry where there was little or no steel making capacity before. Nor can it quickly create an integrated industrial plant. Above all, no one can be certain that it will do so in countries where development has lagged and where there is not only a need for development but an urgent demand that it occur promptly. To trust to the market is to take an unacceptable risk that nothing or too little, will happen."

It is, therefore, contended that the market system should be controlled by deliberate state action in the form of economic planning to increase the rate of economic growth and to have an equitable distribution of income and wealth. There is, however, no need to dispense with the market system altogether as it is done in a centrally planned economy. Rather, development planning should improve and strengthen it in order to achieve the twin objects of the price mechanism under economic planning—to serve as a basis of accounting and to provide an incentive to the people. This can be achieved in a mixed economy where the government formulates the development plan and creates the necessary conditions for development. It provides political and monetary stability, and economic and social overheads. Data about the available resources and development potentialities of the economy are made known. The targets to be achieved during the plan period are laid down. The financial resources for the plan are estimated. The state carries out investment itself, directly manages resources for production and even controls prices of products and services. Last but not least, it facilitates, guides, controls and encourages private enterprises. A proper price mechanism is essential to calculate costs and prices of products and services and to provide incentives to both the public and private sectors of the economy. It is easy to invest in the required channels in the public sector in keeping with the plan targets and also to provide sufficient incentives. But to induce the private sector to invest and produce in accordance with the requirements of the plan, necessitates an appropriate price mechanism. Besides providing the necessary infrastructure in the form of social and economic overheads, the private sector may be given cheap credit facilities, rebates, subsidies, tax concessions. Moreover, divergencies, if any, between social and private returns can be offset by appropriate tax resources and subsidies. But the perfection of the market system through such measures cannot lead to economic equality and rapid development simultaneously. A just income distribution must follow rapid

growth because too much emphasis on the reduction of income inequalities will retard development.[3] Lastly, it is difficult nay impossible to forecast price changes when the elasticities are low in underdeveloped countries. It is, therefore, necessary to decide how much to rely on prices and how far to assume that the price system is ineffective so that planning authority must ensure that the economy will produce what is demanded at whatever prices. If the price system works to an extent, investment can concentrate on the most profitable enterprises and except the trimming and balancing to be undertaken by the planning authority.[4]

Such a decision, however, depends on the stage of economic development through which an underdeveloped country is passing. If it is in the early phase of development, the price mechanism is of little importance. The main problem is to increase the productive capacity of the economy and to evolve an exchange economy by state action. This will mean deliberately distorting the price and cost differentials and holding on to these distortions (as in the case of an effective protectionist policy or a farm support programme to increase the food supply) instead of letting the prices and costs be distorted by random imperfections of the market and short run and speculative factors associated with inflation and balance of payments difficulties." It implies strengthening the price mechanism where it is the weakest in the economy through economic planning. Ultimately, it is only when the economy has reached a higher stage of development that the price mechanism plays its dual role of providing highest efficiency through proper cost accounting and appropriate incentives under development planning. Thus "rational economic planning must aim at enlarging markets and utilising for its purposes the price formation that takes place in the markets which are thus expanded."[5]

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3. H.G. Johnson, *Money, Trade and Economic Growth*, 1962.

4. C.P. Kindleberger, Italics mine.

5. G. Myrdal, *Economic Theory and Underdeveloped Regions*, 1957.

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