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Roger R. Stough
Editors

Public Policy in an Entrepreneurial Economy

Creating the Conditions for
Business Growth

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Public Policy in an Entrepreneurial Economy

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Public Policy in an Entrepreneurial Economy: Creating the Conditions for Business Growth

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Preface

Dedicated to our Students

Ever since my days at the Small Business Administration, I have been interested in entrepreneurship policy. Over the years I have pursued this question at the Max Planck Institute in Jena Germany and the Kauffman Foundation. The subsequent discussion and chapters in this book is a product of that deliberation. This volume grew out of my PhD course in Entrepreneurship and Public Policy at George Mason University. The School of Public Policy and my colleagues have been working on articulating a policy perspective for the past several years. In particular we have focused on developing countries, innovation and technology and social entrepreneurship. The present volume represents a viewpoint on the subject.

Acknowledgments

We would like to thank Scott Jackson who in addition to his contribution to this volume has been the point person for compiling the book. He worked closely with me and the other authors and has continued to facilitate the process long after his obligations have been met. Scott has demonstrated conscientiousness, diligence and excellent communication skills in this effort. He committed numerous hours to review and editing of chapters, team meetings discussing, formally commenting on content and in discussions with myself, the other primary author Dr. Roger Stough and his classmates to pull together the camera ready version of the book.

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Abstracts

1. Introduction, Zoltan Acs
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2. Entrepreneurship and Small Business Policies under the Presidential Administrations of Presidents Carter, Reagan, Bush and Clinton: 1977 to 2001, Linda Le

The author surveys the entrepreneurial and small business policies from Carter through Clinton, evaluating each based on how they fostered entrepreneurship, or small business ownership, and if these policies seek to create economic efficiency or target market equity for specific groups. It provides a theoretical framework for analyzing each administration's major small business and entrepreneurship policies and examines each policy's overall effects on small business and entrepreneurial activities, its qualifications as a target market equity or economic efficiency policy, and the policy's beneficiaries. This discussion should provide policy makers, researchers, and academics the ability to recognize the types of policies which best foster entrepreneurial and small business activities, and also encourage policy makers to pursue these types of policies.

3. The Unintended Consequences of the Sarbanes-Oxley Act on Small Entrepreneurial Business, Jiamin Wang

The Sarbanes-Oxley Act, with the purpose of improving corporate disclosure integrity and restoring investor confidence, seems to have generated unintended consequences on small entrepreneurial business. A theoretical analysis of both the benefits and costs of SOX implies that while SOX certainly plays a positive role in reducing the agency problem and information asymmetry for entrepreneurial firms, it has also imposed disproportionately higher direct compliance cost on those firms, and incurred tremendous opportunity costs. This is explored using data on the "going public" tendencies and venture capital patterns of these firms. The author finds that SOX has affected not only the tendency of firms to go private but also observes that these firms are smaller as a result of SOX possibly

the result of increased compliance costs. Policy recommendations are made accordingly.

Keywords: Sarbanes-Oxley Act (SOX), small entrepreneurial business, going-private, compliance cost, computer software industry

4. The Impact of Sector Specialization on Entrepreneurial Activity: Empirical Analysis and Policy Implications, Haifeng Qian and Huaqun Li

Entrepreneurship is becoming widely recognized for its role in economic growth. The successes of Silicon Valley, Austin Texas, and Northern Virginia in the U.S. suggest that entrepreneurial activity is preferential for specific sectors (e.g. high-technology industries). This implies a sector concentration of entrepreneurship. The author explores whether sector specialization has an impact on the level of entrepreneurial activity or not in U.S. Metropolitan Statistical Areas. The econometric results show that sector specialization is a significant contributor to entrepreneurial activity, while, local factors such as population growth, income growth, unemployment rate, average establishment size and human capital all affect entrepreneurship. The paper sheds some light on the direction that future entrepreneurship policy should take.

Keywords: Economic growth, entrepreneurship, sector specialization, firm formation, region

5. Entrepreneurial Healthcare: a Study in State Policy Arbitrage, Scott Jackson

The author explores the relationship between entrepreneurship and health policy, specifically insurance policy, and the question of optimal design of insurance system to catalyze entrepreneurial activity in light of current policies designed primarily to address equity and cost issues. The analysis reviews the theory on the impact of social policy, specifically health insurance, upon the entrepreneur, and constructs a framework for analysis of health financing/insurance with respect to entrepreneurial activity. It presents a high level summary of current state initiatives and Health Savings Accounts (HSAs)/High-Deductible Health Plans (HDHPs) and evaluates them in light of this framework. The author finds that HSAs/HDHPs and transitioning the insurance market to an individually oriented market remain the policy alternative most consistent with an entrepreneurial economy.

6. Evaluating University Technology Transfer Offices: How to unclog the system and let entrepreneurship through? Kirsten Sachwitz Apple

Programs to transfer technology from universities and government agencies to the private sector are a cornerstone of economic development in the US economy. Most US universities today have a centralized technology transfer office which handles all of their intellectual property; however, the question remains “is this the most effective means of technology transfer?” The evidence is mixed or minimal for all other measurements including licensing and spin-offs, but suggests a bottleneck remains in the commercialization of new technologies. The author posits a new operational model and strategic principles university technology transfer offices should employ.

7. Simulating the Impact of Policy on Entrepreneurship, Ryan Sutter

The resurgence of interest in role of the entrepreneur in economic change has led to a reexamination of the role of public policy strategies that seek to facilitate and promote entrepreneurship. However, the impacts of many proposed public policies on entrepreneurial outcomes are difficult, at best, to quantify. As a result, little public policy analysis regarding the potential for the success of the proposed sets of policies exists. This research at-tempts to, in part, fill in this gap by first generalizing a sample policy proposal to its most basic dimensions of effect and then analyze the impacts of these generalized dimensions on entrepreneurial outcomes using simulation modeling. The results of the analysis suggest that public policies directed at: 1) increasing the aggregate level of human capital and 2) increasing the aggregate stock of new knowledge; have the most influential impact on entrepreneurial outcomes.

8. Putting the Entrepreneur Back into Development and Foreign Policy, Nicola A. V. Virgill

Over the last 60 years, developing countries have generally used two strategies in their pursuits of development - import substitution and export promotion with limited results except for East Asia. Both approaches relied on strong state intervention and persistent market distortions to sustain their viability, and thus, have often crowded out or thwarted altogether the traditional role of the entrepreneur – the driving force of creative change and innovation in an economy. The author finds that developing countries face greater institutional barriers to entrepreneurial activity and that these institutional barriers negatively impact economic performance. The

analysis suggests that countries which seek to improve their economic performance should improve their business environments, and recommends the promotion of entrepreneurship and entrepreneurial institutions through targeted development assistance aimed at business environment restructuring become a key foreign policy objective for the United States.

Keywords: Development Policy, Entrepreneurship, Export Promotion, Foreign Policy, Import Substitution

9. Innovation in Manufacturing: the role of foreign technology transfer and external networking, Juan Julio Gutierrez

This paper explores the determinants of three innovation outputs in low technology manufacturing factories by exploring innovation dependent on the factory's network of relationships, both internal (intra-firm cooperation) and external (inter-factory and inter-firm) using data from, the World Bank's "Investment Climate Survey" (ICS).

The results support the idea that external networks, mainly interaction with universities, and purchasing of foreign licenses constitute a mechanism for generating innovation outputs in low-technology sectors. Foreign ownership does not appear to be a driver of innovative outputs. On the iput side, the results show importance and robustness of capital goods, adaptation and development within the factory where learning by doing, and new technical personnel.

10. The Entrepreneurship and Development Nexus: Conceptualizing the Nexus with Examples from China and India, Roger R. Stough

The Entrepreneurship and Development Nexus provides some perspective on why entrepreneurship has become more important in recent years for developing countries. In providing some answers to this question insight is provided into why entrepreneurship policy and programs have grown in popularity as part of the primary development tools used in both developed and developing economies. With this rising importance comes the basic question of how entrepreneurship can be applied as a tool to promote growth and development at the regional level especially in a development framework. Further, the chapter recognizes that there has recently been a huge rise in the general importance of entrepreneurship in social, political and economic realms. This is supported by the fact that there has been an enormous growth in the amount of scholarly and gray entrepreneurship literature.

11. Democratic Capitalism and Philanthropy in a Global Economy,
Zoltan J. Acs and Sameeksha Desai

When the market creates social problems, non-market solutions may alter or equalize them. The response to social problems in many countries has been through legislative, regulatory or other government action. In many countries in the developing world, state solutions are crippled by poor funding resources for social issues, lack of technical ability to achieve adequate solutions, and in some cases, lack of government legitimacy. Given this, the ideal solutions for social problems must come from non-market and non-state sources. We argue that philanthropy, a social innovation born in the United States, has great potential to work in other countries.

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1. Introduction to Public Policy in an Entrepreneurial Society

Zoltan J. Acs and Roger R. Stough

1.1 Introduction

At a crossroads! Europe – with a long history of tightly managed economic and social structures designed to enhance state control - is now confronted by weakening growth, employment and collapsing social welfare systems (Audretsch, Grilo and Thurik, 2007). The U.S. - with its strong anti-statist traditions - maintained substantial control of the economy by the state until the 1970s. However, growing international competition forced the U.S. to rethink its position in the global marketplace. Economists regularly demonstrated how regulated systems actually create higher, not lower, costs for consumers. Thus, the U.S. began an economic era of reform and deregulation, which has led to the emergence of the present state: *The Entrepreneurial Society* (Acs and Audretsch, 2002).

The Entrepreneurial Society has been decades in the making. It is characterized by dramatic innovation and productivity growth. For the U.S., the most important question has become how to maintain its economic dynamism within this new state of affairs. After the collapse of the Soviet state and emergence of transition economies, the important question for developing countries is choosing the best model to pursue. Developing countries can adopt an economic system similar to Europe, where large state companies and bureaucracies dominate, often driving scientists to find work in the U.S. On the other hand, these countries can evaluate economic policies and consciously model their own strategies similar to the U.S. (Stough, Kulkarni, and Paelinck, 2002).

1.2 The Entrepreneurial Society

In *The Changing Structure of the U.S. Economy* (1984), Acs first articulated that markets, new technology and entrepreneurship are at the heart of the transition from a *managerial economy* to an *entrepreneurial society*. The full flowering of this process has recently been told by David Audretsch in *The Entrepreneurial Society* (2007), and Carl Schramm in *The Entrepreneurial Imperative* (2006a). These three books push against the same thing: The Managed Economy.

Audretsch and Schramm describe in detail this economy of the 1950s, carefully documenting the interaction between labor, big business and government. In “Our Lazarus Moment” and “The Deluge”, Schramm and Audretsch, respectively, describe the moment of the tipping point for the years of transition in the United States. In a remarkable way, both of these books come to similar conclusions about the nature of the new American Society. However, they do not see its future in the same way. Audretsch believes that the rest of the world learned from the American model, thereby threatening its own comparative advantage. He notes: “America had in ten year transformed itself from a self-doubting society to one of self-celebration. America had it, and the rest of the world did not.....Having spent considerable time in Europe and Asia observing recent efforts to create their versions of an entrepreneurial society, ‘I wondered, What will the United States do when the rest of the world catches up?’” (Audretsch, 2007)¹” Carl Schramm has an answer for Audretsch: Far from fearing an entrepreneurial transformation around the globe, future of the American experiment actually depends on the rest of the world emulating it! “For the United States to continue its global leadership, it must help the world see clearly the breadth and depth of our economic evolution...It is in American’s interest to see our system replicated all over the world. We must believe that in flourishing entrepreneurial economies the widening distribution of wealth and the creation of new jobs will naturally help lead to the spread of democracy....*It is imperative that we—everyone everywhere—go into this entrepreneurial future together*” (Schramm, 2006a, emphasis added)².

Before we go further, we should first understand what this increasingly entrepreneurial society looks like. Five distinct features are noteworthy:

- *Markets and individual firms are replacing bureaucracies.*
The implicit compact between “big labor, big business and

¹ Audretsch (2007), p. 192.

² Schramm (2006a), p. 176.

big government” (Galbraith, 1967) that once existed in the managed economy has disappeared. Labor’s share of the workforce has fallen dramatically, big business is in flux³ and government functions across sectors are increasingly being contracted to the private sector.

- *Knowledge is more important.* Knowledge and the universities that produce new knowledge are far more important role than they were in the early 20th century. Today, the university is an integral part of the institutional infrastructure of the entrepreneurial society, where knowledge has replaced brawn as the most important input into production. As suggested by the Economist, The “Knowledge Factory” has become the most important institution in generating knowledge to fuel the entrepreneurial society (The Economist, 1977).
- *Firm structure is more dynamic.* After World War II, large firms dominated the U.S. economy, often in oligopolies. Turnover among these firms was minimal and new firms played a minor role. This has changed dramatically in the last several decades. New firms offering new products and services (in IT, biotechnology and retail) and foreign entrants into traditional industries (such as automobiles and steel) have been major drivers, if not *the* main driver, of economic growth. A hallmark of entrepreneurial firms is relatively flat management structures with rapid responsiveness to market demands; whereas large firms host more bureaucratic, hierarchal management and thus, decision-making takes longer.
- *The nature and process of innovation is very different.* Led by risk-taking entrepreneurs, new firms are disproportionately responsible for “radical” or “breakthrough” technologies, although larger managerial firms are typically needed to refine, mass-produce and market these technologies (Baumol, 1993). The innovations that now characterize modern life - the automobile, telephone, airplane, air conditioning, personal computer, most software and Internet search engines - were all developed and commercialized by entrepreneurs. Radical innovations tend to generate faster overall growth than incremental improvements. For

³ The rankings of leading firms in the United States are constantly changing.

example, the IT Revolution, which was ignited largely by entrepreneurial companies, has statistically accounted for the significant acceleration in US productivity growth over the last decade (Acs and Audretsch, 1989).

- *Equal opportunity for all.* In the managed economy, government closed the model. In other words, government was the recipient of residual income through income and inheritance taxes. In an entrepreneurial society, the final arbiter of wealth reconstitution is the third sector, or philanthropy. This uniquely American mechanism allows society to sustain itself without institutionalizing existing class structures (Acs and Phillips, 2002).

The Entrepreneurial Society has enjoyed remarkable economic success during the past decade, as indicated by the most important economic statistic: Rate of productivity growth. Over the long run, this determines the rate of improvement in average living standards. After surging to 2.6 per cent annually from 1950 to 1973, productivity growth dropped to 1.4 per cent in the period from 1973 through 1995. Although this decline may seem trivial, it has enormous consequences over time: Living standards double every 28 years at the earlier rate of 2.6 per cent, whereas this doubling would take more than 50 years at the rate of 1.4 per cent. What accounts for this good fortune so far? Conventional economic wisdom has converged on the opinion that the IT revolution – especially rapidly falling prices of computer chips and dependent products – has been critical. When measured by conventional statistics, there seems to be much truth in this (Oliner and Sichel, 2002).

This decades-long structural transition, from a managed economy to an entrepreneurial society, seems to have played an important role in the acceleration of economic growth (Acs and Armington, 2006; Audretsch, Keilbach and Lehmann, 2006; Baumol, Litan and Schramm, 2007).

1.3 American Exceptionalism

Why did this transformation occur? First, the U.S. has always been an entrepreneurial society, with a brief exception during the time between the presidencies of Roosevelt and Reagan. Much of the early understanding of *American Exceptionalism* is derived from the “foreign traveler”⁴ literature,

⁴ S.M. Lipset (1996), p. 17

most notably *Democracy in America* by Alexis de Tocqueville. The use of the descriptor “*American exceptionalism*” refers not to the embodiment of a superior domestic culture, but to the idea that the U.S. is fundamentally “qualitatively different.” Most other countries, the Soviet Union being the exception, define themselves via a common history or birthright (Lipset, 1996)⁵.

The United States is exceptional because it started from a revolutionary event, as the “first new nation,” and the first colony other than Iceland, to become independent. It has defined its *raison d’être* ideologically: “It has been our fate as a nation not to have ideologies, but to be one.” The American Creed can be described in five terms: Liberty, egalitarianism, individualism, populism and *laissez-faire*. A modern translation can be summarized in terms of action and behavior, as entrepreneurship, philanthropy and the creation of opportunity. In other words, the goal is not to reproduce the class structure but to prevent this from happening.

In this context, egalitarianism implies equality of opportunity but not equality of outcomes. This grew from the absence of feudal structures - as such, class structures and hierarchy were less important in more aristocratic societies. Religious participation has been voluntary, and in it has been reinforced by sociopolitical individualism and not the state. According to John Hancock, a party to the Declaration of Independence: “The more people who own little businesses of their own, the safer our country will be, for the people who have a stake in their country and their community are its best citizens.”

Americans have traditionally eschewed statism; in fact, the U.S. Constitution does not provide positive rights, in stark contrast to many other democracies (Lipset, 1996)⁶. To some extent, American exceptionalism is “the absence of significant socialist movement”, as evidenced by less union participation than in other countries (1996)⁷.

The focus on individualism and a weak state sets American public policy apart from the politics of other developed countries. Exceptional American societal aspects are *class structure* and *religious system*. In the former, an insistence on meritocracy results in a more productive climate. Coupled with a continued emphasis on equality of opportunity, the U.S.

⁵ S.M. Lipset (1996), p. 18-19

⁶ S.M. Lipset (1996), p. 22

⁷ S.M. Lipset (1996), p. 23

has provided strong motivation for individual success and mobility (Lipset, 1996)⁸:

Americans have never accepted the idea of rigid hereditary classes.... Hard work, ambition, education, and ability have been regarded as more important for succeeding in life than social background. Recent opinion poll results indicate that almost three quarters of Americans believe they have a good chance of improving their standard of living, while only two fifths of Europeans display this level of optimism.

The *religious system* is that of the Protestant sect - the "Protestants of Protestantism, the Dissenters of Dissent" - the epitome of bourgeois values (Lipset, 1996)⁹. "Americans are utopian moralists who press hard to institutionalize virtue, to destroy evil people, and eliminate wicked institutions and practices." (Lipset, 1996)¹⁰. The Protestant sense of personal responsibility has led the intensely committed to follow their consciences, as reflected by those who have supported and opposed wars. Further, the underlying support for private social coping mechanisms, such as philanthropy, is rooted in individualistic philosophy and suspicion of government (1996)¹¹.

The New Deal significantly altered one fundamental aspect of the American Creed. The rise in state power during the postwar period realigned the American system closer to European values, pushing the country towards regulation rather than a market economy. This had consequences far beyond those intended, or expected, and it led to a revolution in the 1960s.

1.4 Back to the Future

Why did this change come about? The 1960s in the U.S. was a period of social transformation and a return to roots: Liberty, egalitarianism, individualism, populism and laissez-faire. Although this decade is often viewed as a mixed blessing by those that lived it, one thing is certain: The rules had changed! Perhaps the main contribution of the 1960s generation

⁸ S.M. Lipset (1996), p. 54

⁹ S.M. Lipset (1996), p. 60

¹⁰ S.M. Lipset (1996), p. 63

¹¹ S.M. Lipset (1996), p. 68

was the tearing down of many institutions that were the cornerstone of the managed economy, thus freeing the way for entrepreneurs—who would ultimately save the American economy in the 1990s. Opportunities at the end of the decade were far more vast and numerous than at its start. Blacks and whites could attend the same school, sit on the same bus and eat at the same restaurant. It became possible for women to pursue education and careers in nearly all professions. If this period did not completely undo the New Deal, it altered its direction over the next two decades.

The generation of the 1960s seemed to have had consistent difficulties adjusting and adapting to everything that came after. This generation knew what it did not want, but was far less certain about what it wanted. According to Audretsch (2007)¹²:

If the 1950s produced the organization man, the 1960s produced the young men and women who were the organization man's antitheses. Young people certainly did not feel compelled to conform or fit in—at least not with the norms, modes, and rules inherited from the 1950s. While it was not the end of the organization man, it was the beginning of something else, something more important—Americans were liberated and freed from the constraining rigidities that had enabled the 1950s managed economy to thrive in the first place. By tearing down a number of rules, regulation, habits and traditions—the values and institutions of the managed economy—the 1960s opened up the possibility for the next generation to not only deviate from norms but to deviate in such a way as to create new values, create new products and ultimately generate entire new industries like software, biotechnology. The sameness of the managed economy—the conformity, monotony, rigidity, and homogeneity—had been replaced by nonconformity, autonomy, creativity, and self-reliance.

In other words, a return to *American Exceptionalism*!

In *The Vantage Point*, the late President Johnson outlines the legislative accomplishments of his service with respect to civil rights, poverty, healthcare and global challenges. Following the rewriting of social rules, changes in institutions of the managed economy were paramount. Several federal policy initiatives during Democratic and Republican administrations over the past three decades have supported these changes. They have allowed the transition from a managerial economy to The Entrepreneurial

¹² Audretsch (2007), p. 15-16.

Society so that Americans could invent the future. These included among others:

- *Reducing institutional barriers to entry.* The removal of legal barriers to entry and price controls in key industries - specifically transportation and communications.
- *Awareness and action against excessive regulation.* Successive Executive Orders required executive branch agencies to at least study the costs and benefits of introducing new regulations prior to adoption. Agencies were also required to tailor regulations to the “size and the resources of the affected business,” with special flexibility for small businesses seeking to raise capital.
- *Tax system enhancements.* Various reforms had the effect of enhancing rewards from entrepreneurship, including cuts in the capital gains tax rate (from 49 per cent prior to 1977 to a current rate of 15 per cent) and reductions in the top individual marginal tax rate (from 70 per cent prior to 1981 to a current rate of approximately 38 per cent).
- *Financial market reforms.* Legal changes have allowed pension funds to finance the formation and growth of new firms, by investing in venture capital partnerships.
- *Improving access to knowledge and innovation.* Federal legislation targeted accelerating the commercialization of innovations in universities and in small business. In universities, this was done through the Bayh-Dole Act of 1980, which granted exclusive control over federally funded inventions; in small business, this was done through the Small Business Innovation Development Act of 1982, which earmarked 1.25 per cent of federal R&D funds for these companies.

By the mid 1980s, the entrepreneurial spirit would rise once more, to challenge bureaucratic hegemony, thereby catalyzing the end of the managed economy. Kirchoff (1994) demonstrates that entry is a necessary condition for economic development, if long-run market concentration and declining innovation rates are to be avoided. The re-emergence of entrepreneurship in the United States during the 1980s - and the positive channeling of it - are a triumph of the system. Michael Milken made much of the financial investment in American information infrastructure during the 1980s. According to the *Wall Street Journal* (March 2, 1993) he was one of the supreme investors in the history of finance, and invested \$21 billion in the information industry. His largest

contributions were to MCI, Tele-communications Inc, McGraw Cellular Communications Inc, Turner Broadcasting, Time Warner Inc and Metromedia Broadcasting. These companies could likely never have raised comparable amounts from other sources of finance, as they were virtually devoid of conventional collateral. The original investment of \$10 billion in these companies had a market value of \$62 billion in 1993. This web of glass and light is now an essential resource in the information economy, and a key comparative advantage of the American economy. A second wave of entrepreneurial companies, financed in part by venture capital, is in the process of completing the infrastructure for the information age: America on Line, Cisco Systems, Amazon.Com, Netscape, and Yahoo.

1.5 Public Policy in The Entrepreneurial Society

This introduction is written from the perspective of the U.S. economy, which is generally accepted as the leading entrepreneurial society in the world. This provides an excellent background against which we may evaluate policy in other countries, both developed and developing. We are able to take an integrated approach to understanding how other countries fit into this framework (Kauffman, 2006), across multiple levels of analysis ranging from the individual to the macro economy.

1.5.1 Policies Relating To The Global Economy

It has become cliché to make reference to a global economy, but it is true nonetheless. As a result, entrepreneurs that ignore the global market do so at their peril when designing and implementing business plans. Likewise, the implication for policy makers is clear: In order to promote entrepreneurship, they must think globally rather than locally or even nationally (Schramm, 2004). This manifests in at least the following major policy arenas: Trade, immigration and technology.

- *Trade Policy.* Capitalist economies rest on a fundamental principle: The freedom of exchange. This allows individuals and firms to contract with one another, thereby allowing economies to realize benefits from specialization, economies of scale and comparative advantage. Together, this maximizes economic welfare – and when exchange moves across countries, benefits are maximized. In essence, this is the classic case for free trade. Entrepreneurs and established firms, alike, cannot succeed in a global environment

without the ability to move quickly and contract for the lowest cost and highest quality inputs, wherever they may be found. They also need to sell to purchasers, wherever they may be located. This cannot be possible if governments maintain artificial barriers to restrict the movement of goods, services, capital and ideas across borders. (Brainard, Litan and Warren, 2005).

- *Immigration Policy.* In the wake of 9/11, legal immigration in the U.S. has been tightened in the name of national security. More recently, Congressional proposals to criminalize and deport millions of illegal immigrants have generated vigorous debate and mass protests throughout the nation. An entrepreneurial perspective implies several policy approaches with respect to immigration. The implication for legal immigration policy is clear: Emphasize educational background of potential immigrants, but maintain deference to the needs of national security (i.e. prevent the entry of individuals with criminal backgrounds or associations and activities that pose a real threat). Future advances require the commercialization of continued improvements in technology. In the past, immigrants have made huge contributions and can continue to do so, if policies permit.
- *Access to Foreign Technology.* One of the worst economic mistakes any business or country can make is to adopt the “not invented here” syndrome: Refusal to embrace something developed and used elsewhere. Certainly, this is not the case for many countries that have licensed or used American technology - and in the process, also improved economic welfare. In some cases, this has occurred at a faster pace, though from a lower starting level, than in the U.S. Likewise, the U.S. has benefited from investment by foreign companies – especially in manufacturing – that have enabled technology transfer and introduced new products in the domestic market. For example, where would the American manufacturing sector be without “Just In Time” production systems or “quality circles” pioneered in Japan? The U.S., and its entrepreneurs, could do even better if government took an active role in facilitating awareness of foreign technologies (Brezneitz, 2007).

1.5.2 Taking Entrepreneurship Into Account In Setting National Policies

Policymakers constantly confront questions of importance to the national economy, and many factors affect how decisions are made. Given a presumptive causal link between long-term economic growth and entrepreneurial activity, it behooves policy makers to consider the impact of their decisions on entrepreneurship. There are several essential points in this regard: Education policy, science and technology policy, health policy and litigation and regulation.

- *Education policy.* Although not a guarantee of success, a strong educational system (primary, secondary, tertiary and above) is a clear prerequisite for continued economic growth. Assuming that the right incentives are in place to reward innovation: The greater the proportion of highly educated people, the more likely it is that some will generate and commercialize breakthroughs. These will then generate growth in incomes and living standards for all residents, and for many around the world as well. Even innovations by a relative few require many skilled workers to refine, produce, market and distribute their resulting products and services. The U.S. owes much of its economic success to its enviable record in providing universal primary and secondary education to citizens. It is possible that in the two models of a managed economy versus an entrepreneurial society, the optimal educational systems may differ in structure, character and content.
- *Science and technology policy.* Productivity improvements come from technical change, which requires both the discovery of new ideas and commercialization by entrepreneurs and existing firms. In turn, new ideas result from research and development, which span the range from basic research (such as the discovery of new scientific laws or improvements in understanding basic science) to development activities (the embodiment of new ideas in products, services or production techniques). It is now well understood that because the benefits of basic research cannot be fully captured by those who pursue it, and that society is better off if government funds it and either pursues it directly, or contracts it to universities and private sector research organizations.

- *Health policy.* Regardless of the mechanism of healthcare provision, health policy in an entrepreneurial society should be directed at improving individual health in order to free people to pursue their interests professionally. It cannot create “job-lock” or prohibitive selection for small, entrepreneurial ventures. Instead, it must provide optimal choice for consumers (i.e. entrepreneurs), ensure adequate protection at reasonable cost and be supremely flexible.
- *Litigation and regulation:* It is important not only for government to facilitate the formation of new businesses but also to encourage their growth and expansion. At the very least, this should not be penalized. In this respect, government across levels should be committed to analyzing the costs and benefits of new regulations before adopting them. Where possible, there should be allowances for streamlining procedures for new businesses. Particular attention should be paid to regulations which ultimately deter entry by new businesses, as they typically do not have the resources or capability for compliance as do more mature firms. At the same time, existing regulatory regimes bear examination and some may need modification (the Sarbanes-Oxley Act is a prime example) (Kamara, Karaca-Mandic and Eric Talley, 2005). Litigation can have the same effect as regulation, resulting in verdicts that set norms for behavior by firms and individuals in specific industries or across many, or all, sectors of the economy. This allows for precedent to be established in a specific context and place, but to apply across the board elsewhere.

1.5.3 Regional Policies to Promote Entrepreneurship

As Thomas P. O’Neill Sr. noted to his son and budding politico (O’Neill and Novak 1987): “All politics is local.” So, too, all entrepreneurship is local. If successful, individuals expand into other locations. Still, all new firms must start somewhere, even if business is conducted largely or exclusively on the Internet. Policymakers likewise are increasingly recognizing entrepreneurship as the key to building and sustaining economic growth. Policy has historically focused on attracting existing firms *from somewhere else*, either to relocate or build new facilities in a particular area. Such “smokestack chasing” has degenerated into what is essentially a zero-sum game for the national economy. When one city or

state successfully attracts firms away from other locations through tax breaks or other inducements, an alternate city or state loses that activity. However, zero sum arguments assume away an alternate condition: The actual decision to establish a new firm or plant. Simply put, a zero sum game only exists *after* the decision to establish has been made. In an entrepreneurial society, policy considers that this alternative hypothesis is not a foregone conclusion - thus, the idea of economic development *centered around entrepreneurship* is a fundamentally different approach. The formation and growth of *new firms*, regardless of location, is clearly a *positive sum game* for the locality and more importantly, for the nation as a whole.

A brief look at various “high-tech” clusters around the country – from Silicon Valley, to Austin, Research Triangle Park (North Carolina), San Diego, Boise, Denver, Madison, Route 128 around Boston, Northern Virginia, to name just a few – demonstrates the overall positive effects of development around entrepreneurship. The United States economy has benefited, as a whole, from the innovative products and services that have emerged from these clusters. The same is true for other countries. High-tech and high-growth clusters in India, China, Taiwan, Ireland and Israel, for example, are powering economic growth far beyond these countries (Brezneitz, 2007). Some clusters host firms that have become essential within worldwide supply chains. Others are becoming leaders in new product and services development. Still others are doing both (Karlsson, Johansson, Stough, 2005).

1.5.4 Policies That Primarily Affect Entrepreneurs

Any society interested in encouraging entrepreneurship must make it relatively easy to transition from the drawing board to the marketplace, and rewarding enough so success results in repetition. Entrepreneurs that repeat the process make multiple contributions to the market, thereby increasing consumer welfare. For the most part, the U.S has developed institutions over time to allow this: The legal system protects contracts and property (including intellectual property), state and local registration systems facilitate business formation, the tax system has evolved towards lower marginal tax rates and the financial system generally favors the formation and growth of new ventures (Wennekers, van Stel, Thurik and P. D. Reynolds, 2005).

There are policies directed at entrepreneurs themselves within any entrepreneurial framework. These affect individual decisions to “take a job or make a job” – that is, to work for someone else or make the riskier but

potentially more profitable choice and launch an enterprise. These policies include: Easing business formation, easier access to finance, protection of intellectual property and tax policy.

- *Easing business formation.* Entrepreneurs cannot be expected to “take the plunge” unless it is easy and inexpensive to do so. The U.S. government has done this well at all levels, a judgment confirmed by the World Bank (World Bank, 2007). Still, there is room for improvement, particularly at the state and local levels, where businesses actually register and must acquire various permits. For example, it is possible to make it easier for new and existing firms to obtain and submit forms on the Internet. This is likely to be cheaper and more quickly accomplished than building new (or retrofitting existing) physical facilities, such as “one-stop shops.” Some cities have already done this, and other cities and states may wish to consider this in conjunction with an active Web-based initiative (Klapper, Luc, Rajan, 2006).
- *Ensuring access to finance.* Virtually all-new ventures require some initial amount of capital and often more as they grow. The U.S. has created a financial system conducive to business formation and growth. The “democratization” of credit markets, whether through credit card or mortgage lending, has supported many entrepreneurs without access to social networks of wealth (Blanchflower, Levine and Zimmerman, 2003). In the past several decades, a vibrant venture capital industry has developed to fund the relatively small but vital number of technologically sophisticated or capital-intensive start-ups. In recent years, “angel investors” – wealthy individuals or groups of such individuals – have become an increasingly important source of early-stage equity capital as well. By some accounts, angel investors may now be more important than venture capital, especially after the “Internet stock bubble” burst of 2000. As for debt finance, banks and finance companies have been the traditional sources of funds. However, both types of lenders face increasingly stiff competition from securities markets, which are financing a growing share of debt from larger entrepreneurial firms that have gone public.

- *Appropriate protection of intellectual property.* One of the ways entrepreneurial economies motivate people to become entrepreneurs is by promising legal protection for their ideas. This is accomplished with intellectual property laws such as patents, copyrights and trademarks. There is a complicated tradeoff involved when providing exclusive protection to inventors or creators (Merrill, Levin and Meyers, 2004). If protection is granted for too long or is excessively easy to obtain, then government essentially permits monopolies and public returns are limited. On the other hand, if protection of intellectual property is too weak, or if legal protections can be easily circumvented through technological means, then inventors and creators may have insufficient incentives to bring their ideas to market.
- *Tax policy.* Rewards for entrepreneurial activity, as for any other economic activity, are reduced by taxes on earnings. At the same time, tax revenues fund public goods, such as physical and legal infrastructure, education, defense and crime detection, punishment and prevention. Without public goods, entrepreneurs (and all citizens) would be unable to pursue their endeavors. A central challenge for policy across levels of government is to undertake measures whose benefits outweigh costs, and to implement and fund them to least distort economic activity (Gentry and Hubbard, 2004). Taxes are - and should be - determined with more than just entrepreneurship in mind. Considerations of revenue adequacy, simplicity and fairness play an important role.

1.5.5 Policies that Primarily affect Society

The final facet of public policy is the issue of social equity and justice. It is well known that these issues are at the heart of survival for any society. The equity issue has two sides. One is equal opportunity participation in the entrepreneurial process: Women, minorities, the elderly and so on. The second element is equity of outcome with respect to wealth creation. This is the core of legitimacy. The fundamental issue here is the sustainability of an entrepreneurial society, which by nature does not reward citizens equally, and the eventual feedback of wealth back into society. Both aspects of equality – equality of access and equality of outcome – can be addressed through philanthropy, the process by which people and institutions give freely both their wealth and time (Schramm, 2006b).

At the heart of American exceptionalism is the idea that rigid social classes should be avoided. One-way to achieve this is to ensure the reconstitution of wealth: “Philanthropy has been one of the major aspects of, and keys to, American social and cultural development” (Curti 1957)¹³. To this we add that philanthropy has also been crucial in economic development. Entrepreneurship and philanthropy together are a potent force that explains the continued dominance of the U.S. economy. In an entrepreneurial society, much new wealth created is given back to the community to build institutions *that have a positive feedback on future economic development*. This has sustained American capitalism over three centuries (Acs and Phillips, 2002). Rather than constraining the rich through taxes, we should allow them rich to campaign for social change through the creation of opportunity. If we stifle opportunities for wealthy individuals to give back their wealth we will impede the future creation of wealth, which has far greater consequences for an entrepreneurial society (Economist, July 29th 2006).

1.6 Moving to an Entrepreneurial Society

An Entrepreneurial Society is different from the managed economy because of the way entrepreneurs facilitate knowledge spillovers (Acs, Audretsch, Braunerhjelm and Carlsson, 2004). In the managed economy, organizations existed permanently and engaged knowledge creation through investment in research and development. However, as Arrow (1962) pointed out, investment in knowledge creation is not straightforward. Organizational inertia may result in new ideas not being commercialized by the incumbent firm. This organizational rigidity serves as a knowledge filter preventing the commercialization of knowledge. The knowledge filter serves to impede, the spillover and commercialization of knowledge.

Entrepreneurship can contribute to economic growth by serving as a mechanism to penetrate the knowledge filter. It is a virtual consensus that entrepreneurship revolves around the recognition of opportunities along with a cognitive decision to exploit them by starting a new firm. Thus, according to the Knowledge Spillover Theory of Entrepreneurship, entrepreneurship permeates the knowledge filter by serving as a conduit for knowledge spillovers. (Acs, Audretsch, Braunerhjelm and Carlsson, 2006).

¹³ Curti (1957), p. 353

Entrepreneurship is the missing link for economic growth because it allows for the commercialization of ideas that would otherwise remain untapped, thereby improving the welfare of consumers.

This leads to the question: What is good public policy in an entrepreneurial society? An emerging policy approach focuses on enabling the creation and commercialization of knowledge. This differs from small business policy that tried to alleviate the cost disadvantage of small firms due to scale economies. Public policy in the entrepreneurial society has a much broader focus, and comprises measures intended to directly influence the level of entrepreneurial activity in a country or region, and the consequences of that action for society. A string of initiatives in the 1990s started to place attention on individuals instead of firms. However, many of these approaches treated “SME policy” and “entrepreneurship policy” as one and the same. They are essentially different, as SME policy focuses on bringing disadvantaged individuals into the economic mainstream (Storey, 2003). Entrepreneurship instead leverages the “best and the brightest.”

In fact, policy approaches have been so misaligned that they have, thus far, missed the essential point: That there is no such thing as “entrepreneurship policy” per se. There is only public *policy in an entrepreneurial society*. Acs and Armington (2006, Chapter 7) lay out, for the first time, a policy formulation for an entrepreneurial society and the chapters in this book deconstruct multiple applications and levels of analysis. The key question is: *How can policy makers maintain and ideally accelerate the continued transition toward a more entrepreneurial society?*

1.7 The Chapters

This book addresses the most fundamental and important links between entrepreneurship and public policy, and identifies key salient implications for an entrepreneurial society, from the perspective of American exceptionalism. The first section of this volume focuses on the link between entrepreneurship and public policy in the U.S; the second section addresses the relationship between entrepreneurship and economic development in the global economy. The final chapter connects the entrepreneurial society with American exceptionalism.

In chapter 2, “Policies and Entrepreneurship from Carter to Clinton,” Linda Li surveys the entrepreneurial and small business policies enacted during presidential administrations from Carter through Clinton. She

evaluates each, based on how they fostered entrepreneurship or small business ownership, and if they were designed to create economic efficiency or market equity for specific groups. She concludes with an explanation of the different trends and tendencies in entrepreneurship and small business policies between 1977 and 2001. This framework provides policy makers, researchers and academics a way to recognize the types of policies which best foster entrepreneurial and small business activities.

In chapter 3, “How does Sarbanes-Oxley Impact Entrepreneurial Firms,” Jiamin Wang examines the unintended consequences of the Sarbanes-Oxley Act on small entrepreneurial businesses. The stated purpose of the Sarbanes-Oxley Act was to improve corporate disclosure, integrity and restore investor confidence. However, it seems to have generated unintended consequences on small entrepreneurial business, affecting not only the propensity of businesses to be private but also influencing the venture capital financing pattern. This has hurt small, entrepreneurial firms with regard to capital formation, which is pivotal in their success. Wang writes a case study of the computer software industry, paying close attention to the effect of compliance costs on small and entrepreneurial firm, and follows up empirical analysis follow with policy recommendations.

In chapter 4, “Specialization and Entrepreneurial Activity,” Huaqun Li and Haifeng Qian test the impact of sector specialization on entrepreneurship, as expressed in new firm formation activity. While entrepreneurship has been studied within specific sectors, little has been done the effect of geographic sector specialization on entrepreneurial activity. The results in this chapter illuminate the effect of sector specialization and other factors on entrepreneurship, challenging the propensity of governments to engage in industry-specific policies.

In chapter 5, “Entrepreneurial Healthcare: A Case of State Policy Arbitrage,” Scott Jackson surveys state level healthcare initiatives and their expected impact on entrepreneurial activity. He constructs a framework centered on four features of healthcare in an entrepreneurial economy: (1) access to care, (2) portability of insurance/healthcare financing, (3) cost of healthcare financing relative to other inputs and (4) the flexibility of the coverage (Baumol, 2007). He discusses the implications for various models of healthcare reform on entrepreneurial activity, movement away from an employer-based system towards an individual based system, and broad impacts of various strategies (e.g. state universal systems).

Kirsten Apple examines university technology transfer activities in chapter 6, “Are Technology Transfer Offices Effective At Stimulating Entrepreneurship?” She surveys the technology transfer offices of the

Kansas State University and George Mason University, and explores their design features with regard to propensity to create new firms (i.e. encourage entrepreneurship) versus license technology to existing, large firms (i.e. discourage entrepreneurship). This chapter offers a new, decentralized model of technology transfer and a university corporate culture, which encourages individual faculty to pursue commercialization of their innovations.

In chapter 7, “What Policies Influence Firm Formation?” Ryan Sutter constructed a simulation model where various policies were grouped into four categories: Tendency to effect entrepreneurial action (TEA), Effect on quality of human capital (QHC), Effect on availability of financial capital (AFC) and Effect on stream of innovations or new routines (NRI). Appropriate policy recommendations are made.

In chapter 8, “Putting the Entrepreneur Back into Development and Foreign Policy,” Nicola Virgil shifts the lens from developed to developing economies. Traditional development strategies of import substitution and export promotion have been largely unsuccessful in lesser developed countries, primarily because they leave no room for the entrepreneur. Development theory and strategy has led to the misguided and often failed attempts. This chapter reviews development theory and literature on import substitution and export promotion, and finds no evidence that these literatures consider the relevance of the entrepreneur. The existence of development policy failures in the form of barriers to entrepreneurship is tested, and appropriate policy recommendations are offered.

In chapter 9, “Innovation in Manufacturing: The role of foreign technology transfer and external networking,” Juan Julio Gutierrez explores the determinants of three innovation outputs in low technology manufacturing factories. He explores the impacts of internal and external networks and innovation inputs, using the World Bank’s “Investment Climate Survey” (ICS).

In chapter 10, “The Entrepreneurship - Development Nexus,” Roger Stough provides perspective on why entrepreneurship has gained importance in developing countries in recent years. He offers insight into why entrepreneurship policy and programs have become popular development tools, both in developed and developing economies. This growing emphasis brings with it the basic strategic questions of how entrepreneurship can be applied as a tool to promote growth and development at the regional level, within a development framework. Further, the chapter recognizes the dramatic relevance of entrepreneurship in social, political and economic realms. This is supported by the enormous growth of scholarly and intellectual interest in entrepreneurship.

In chapter 11, “Democratic Capitalism and Philanthropy,” Sameeksha Desai and Zoltan J. Acs examine two aspects of the entrepreneurial society in the global economy: Entrepreneurship and Philanthropy. The debate on political economy ideology was largely answered by the dominance of capitalist versus socialist systems by the late 1900s, as capitalism spread through former non-market economies as a partner to democracy. This chapter addresses the future of an expanding capitalist system – a system that promotes wealth through the expansion of entrepreneurship – and the social implications of this system. A model of entrepreneurship and philanthropy is presented: The entrepreneur successfully exploits an opportunity, invests in society by reconstituting wealth through philanthropy, which results in further future creation of opportunity. This chapter takes democratic capitalism as *the* modern political economy system and addresses how it is best able to operate in a manner that is equitable, socially responsible and economically sustainable.

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2. Entrepreneurship and Small Business Policies under the Presidential Administrations of Presidents Carter, Reagan, Bush and Clinton: 1977 to 2001

Linda Le

2.1 Introduction

This chapter will evaluate the entrepreneurial and small business policies enacted during the presidential administrations of Jimmy Carter, Ronald Reagan, George H. W. Bush, and William Clinton. It will examine how these administrations fostered entrepreneurship, or small business ownership, and if their policies sought to create economic efficiency, or target market equity for specific groups.

Between 1977 and 2001, these administrations removed many of the regulatory constraints, innovation obstacles, and barriers to market entry, which like fences previously constrained small business and entrepreneurial growth. Over these 24 years, the decentralized energies and disparate innovations of entrepreneurs and small business owners increasingly spurred technological advancements in U.S. markets (Schramm, 2006-b). These uncoordinated entrepreneurial activities undermined the managerial capability of the iron triangle, made up of big government, big business, and big unions, to centrally dictate the direction of the U.S. economy (Schramm, 2006-b). Entrepreneurs' efforts made some industries obsolete, forced many industries to modernize, and created new advancements and business opportunities. This process of entrepreneur driven creative destruction renewed and transformed the U.S. economy. The small business and entrepreneurial policies adopted during these administrations enabled this radical economic transformation.

This chapter will be divided into three sections: 1) definitions and theory, 2) presidential administrations, and 3) analysis and conclusions.

The first section will establish the chapter's definitions for target market equity, economic efficiency, entrepreneurship, technology entrepreneurship, and small business ownership. It will then provide a theoretical explanation of the types of policies that support these business activities and economic goals. This is followed by eight questions that will be used to score each administration's major small business and entrepreneurship policies on a continuum for achieving the goals of economic efficiency or target market equity.

The next section on presidential administrations will chronologically detail the entrepreneurial and small business policies signed under Presidents Carter through Clinton. For each president, this chapter will explain the economic conditions, which influenced policy making during his term in office, as well as review the types of general policies each president advocated. Each administration's major legislative actions or regulatory changes will be examined to determine their ability to foster small business ownership and entrepreneurship. This analysis will include the policy's overall effects on small business and entrepreneurial activities, its qualifications as target market equity or economic efficiency policy, and the policy's beneficiaries.

Finally, the analysis and conclusions section will explain the different trends and tendencies in entrepreneurship and small business policies between 1977 and 2001, using the target market equity and economic efficacy continuum scores assigned to each of the major policies examined. Hopefully, a baseline exploration of the entrepreneurial policies enacted during the four presidential administrations will provide policy makers, researchers, and academics the ability to recognize the types of policies which best foster entrepreneurial and small business activities, and encourage policy makers to pursue these types of policies.

The yearly Economic Report of the President, which accompanies each annual Council of Economic Advisers Report to Congress, will be used to establish historical economic conditions, policy priorities, and presidential views on small business and entrepreneurship. Many policies not mentioned in the Presidential Economic Reports are included in this chapter. Often policies that are suggested under one administration become law in later administrations. Even though this chapter focuses on policy enacted under specific presidents, it recognizes that the U.S. legislative process involves an often combative relationship between the House, the Senate, and the Presidency. Consequently, past presidents may have signed legislation that did not wholly reflect their personal views.

There is a greater level of academic literature written about the effects of older policies and legislation than about newer actions. Often, newer policies do not have as much subsequent legislative activity, academic

analysis, or long-term insights into their historical effects and economic outcomes. Consequently, the long-term effects of many recent federal actions are still being determined. Additionally, most policies and regulations have unintended consequences that can impede their effectiveness or make well intentioned legislation difficult to implement. This chapter will not explore these occurrences.

Culling academic literature on entrepreneurship and small business legislation created the list of significant entrepreneurial policies evaluated on the economic efficiency to target market equity continuum. It is impossible to include every piece of legislation that contains the words small business or entrepreneurship in this chapter. The policies included in this chapter are often the first to promote a specific reform, a new type of program or otherwise have a significant impact on small business or entrepreneurship activities. This list is by no means exhaustive.

2.2 Part 1 Definitions and Theory

2.2.1 Economic Efficiency versus Target Market Equity

The administrations of Presidents Carter, Reagan, Bush, and Clinton enacted entrepreneurial and small business policies, which to varying degrees sought to achieve economic efficiency, or target market equity for specific groups. Some policies promoted eliminating international barriers to trade and restrictive industry regulations that hampered competition. These policies focused on increasing economic efficiency and creating benefits for most companies. Other policies focused on creating target market equity for specific groups, by cultivating particular types of business owners and entrepreneurs, in order to increase their total market participation or type of industry output. These policies were written to explicitly benefit a specific type, or size, of business owner. To better understand the differences between economic efficiency and target market equity policies, it is necessary to define these terms and beneficiaries.

This chapter defines economic efficiency as achieving the highest level of possible output from a market system using the lowest level of inputs in order to decrease inefficiencies, waste, and unnecessary effort. Many general business and entrepreneurial policies focus on increasing the efficiency of the economic system, by eliminating the causes of restrained productivity such as rent controls, trade barriers, and specific industry regulations. Advocates of efficiency-oriented policies argue that society

benefits from an overall increase in efficiency as these policies lead to greater productivity and broader aggregate economic possibilities.

Target market equity is defined as working to overcome social and market barriers to business participation. Its goal is to promote economic growth and social justice by assuring that specific groups secure equal or greater access to economic opportunities and benefits (Nicholson, 2005). Target market equity policies seek to increase economic prosperity by reserving space within institutions and markets for specific populations, such as affirmative action placement in universities, or government contracting preferences. These policies may also seek to promote one type of business or industry through federal support in order to achieve specific economic policy goals. Advocates of target market equity policies argue that, over the long-term, economies cannot expand and prosper if all groups in society do not engage in business and development activities.

Policies that increase economic efficiency may seek to eliminate the group preferences designed to protect industries or promote market participation by specific groups. Policies that increase the market participation levels of underrepresented groups, or seek to advance specific industry sectors, may decrease economic efficiency. Policy makers do not agree on if government action is actually necessary to increase total economic output, fosters market participation, and create new innovations or whether these activities would have occurred without federal intervention. Presidents Carter, Reagan, H.W. Bush, and Clinton understood the inherent conflict between these two types of policies.

Defining Entrepreneurship

Entrepreneurship is defined as unique, dynamic, and expanding young businesses which offer products, services, or methods, that have the ability to create new markets and drive dramatic economic changes (Hart, 2003). Entrepreneurs turn discoveries into commercially marketed innovations that, because of their exceptional or advanced nature, may create new goods, services, and industries. These innovations may generate significant efficiencies, and productivity increases. Often, they make obsolete existing services, devices, manufacturing methods, business models, and industries. Though many new entrepreneurial ventures start out small, these young, vibrant companies often grow quickly in size and market influence (Hart, 2003).

Advanced Technology Entrepreneurship

Advanced technology entrepreneurship, which builds on the basic entrepreneurship definition, is the process of making scientific or advanced research market-ready, so that it can be commercialized into specific technologically sophisticated products (Auerswald and Branscomb, 2003). Economist Philip Auerswald defines technological entrepreneurship as “the conversion of basic knowledge in science and/or engineering to products and/or services ready to market.”¹

In order for inventions discovered in research laboratories to become marketable innovations, these technologies must be transferred to the private sector for commercialization (Auerswald, 2006). Technology entrepreneurship activities include research and development (R&D), opportunity recognition, venture capital financing, product development, manufacturing, and marketing. Each of these stages is necessary to successfully commercialize new technologies (Auerswald and Branscomb, 2003). The trajectory of many innovative, dynamic, and influential technology entrepreneurs, such as the founder of Ebay, Pierre Omidyar, or Google’s Larry Page and Sergey Brin, quickly took them from new, small companies to revolutionary firms and borderline monopolists.

Technology entrepreneurship, and the vanguard products, services, and methods this type of entrepreneurial activity creates, can profoundly change and disrupt an economy. Political Scientist David Hart argues that these new technologies increase an economy’s total overall output by adding technical value to the raw materials and components, making the final device worth much more than the disaggregate value of its components (Hart, 2003). This process of adding value through technical innovation creates new wealth and does more than simply shift economic activities from one business to another. Over time, these technical innovations will proliferate across markets, economies, and countries as the quest for competitive advantage, and the forces of global competition, propel industries into the future.

Bill Gate’s licensing of Microsoft’s operating system to International Business Machines (IBM) and other personal computer (PC) companies, is an example of the creative destruction process entrepreneurship can produce. Through this open hardware arrangement, Microsoft became the universal software and operating standard for PCs. The proliferation of Microsoft’s operating system eventually undermined IBM’s dominance of the computer industry, allowed PCs to proliferate into homes and smaller

¹ Philip E. Auerswald, (May 7, 2006) The simple economics of technology entrepreneurship: market failure reconsidered. George Mason University, p. 2.

businesses, and created a contagion of other computer innovations (TNT, 1999). Entrepreneurs' ability to drive this type of radical technological change, which can destabilize a dominant, colossal company and lead to the emergence of a new business force, lead economist Joseph Schumpeter to argue that entrepreneurship is "the fundamental engine that sets and keeps the capitalist engine in motion."²

2.2.2 Entrepreneurial Framework Conditions and Policies

The existence of specific business conditions will affect an entrepreneur's decision to start or expand a business. According to the Global Entrepreneurship Monitor (GEM) the conditions which "determine a country's capacity to encourage start-ups" include: a) financial markets' ability and willingness to finance new or untested businesses, b) the level of government policies and regulations in the market, c) technology transfer of R&D to the private sector, and d) the commercial and legal structure which protects property rights (GEM, 2004).

Policies that encourage entrepreneurship seek to enhance entrepreneurial conditions in order to increase the total number of new entrepreneurs, and new entrepreneurship generated innovations, in the economy. As Hart explains, "public policy and governance can shape virtually all the contextual determinants of the demand for entrepreneurship and, over a longer time scale, the supply of entrepreneurs as well."³ This chapter will explore two types of entrepreneurial policies: 1) broad based policies that reduce barriers to entry and create opportunities throughout the economy, and 2) narrow technology entrepreneurship policies that seek to foster growth within a target cluster of technology related industries.

Broad Based Entrepreneurial Policies

Broad based entrepreneurial policies seek to economically and socially optimize individuals' abilities to seek, create, and succeed at entrepreneurial

² Joseph Schumpeter, *Capitalism, Socialism and Democracy*. (New York: Harper Brothers), 83 quoted in David M. Hart, *Entrepreneurship Policy: What it is and Where it Came from in The Emergence of Entrepreneurship Policy*, ed. David Hart (New York: Cambridge University Press, 2003), p. 5.

³ David M. Hart, (2003) *Entrepreneurship Policy: What it is and Where it Came from*" in *The Emergence of Entrepreneurship Policy*, ed. David Hart (New York: Cambridge University Press), p. 8.

adventures (Hart, 2003). Entrepreneurial policies increase economic efficiency by promoting competition and eliminating barriers which prevent businesses from pursuing opportunities (Auerswald, 2006). In order to create economic efficiency, these policies work to increase competition by deregulating industries, prosecuting monopolists, and opening markets. They also seek to eliminate internal and external trade barriers, such as capital investment restrictions, or country of origin requirements, which restrain new companies' ability to enter or compete in the market. Theoretically, all types and sizes of businesses should benefit from entrepreneurial policies that increase the ability to pursue new and existing opportunities by working to reduce barriers to market entry and competition.

Narrow Technology Entrepreneurship Policies

Technology entrepreneurship policies seek to increase and hasten the process of turning a scientific invention into a product innovation ready-for-sale in the market (Auerswald and Branscomb, 2003). These policies work to foster new discoveries through R&D funding and programs that seek to develop and then finance emerging technologies. The purpose of these policies is to drive economic growth, job creation, and help keep the U.S. at the forefront of the international knowledge economy.

Many technology entrepreneurship policies focus on facilitating the transfer of technology to the private sector in order to increase the U.S. technology industry's total output and preeminence in world markets. Here technology transfer is defined as the commercialization of discoveries made in government, industry, and university laboratories that enable private industry to profit from the marketing and sale of these advancements. An example of federal technology transfer and private commercialization is the Onstar global positioning system. Air Force technology laboratories originally developed GPS capabilities for military use. Through a federally sponsored technology transfer program, General Motors was able to commercialize and market this technology in its Onstar car navigation system (Pulham, 2006).

Entrepreneurial technology policies have characteristics of both general entrepreneurship and small business policies. Generally, policies that benefit technology entrepreneurs focus on increasing total market output by removing barriers to technology transfer and commercialization. Different sizes and types of technology entrepreneurs will benefit from different policies. Additionally, these policies specifically seek to target technology companies by fostering, motivating, exploiting, and thrusting forward companies engaged in science and technology research over companies

that are not technology oriented. However, these narrow policies seek to increase overall technological output instead of increasing the participation, or market equity, of specific targeted groups based on race, gender, veterans or disability status.

2.2.3 Defining Enterprise and Small Business Owners

Small businesses are defined as businesses that are not novel in their conception and are not quickly expanding in size or market influence. These enterprises do not radically alter, or replace, the industries in which they operate, but can make incremental advancements and changes to their industries by building on existing market structures. While these businesses may grow, and expand, they do not experience the same type of dynamic growth that characterizes the companies of entrepreneurs and technology entrepreneurs. Small businesses' incremental improvements and refinements, though dynamic and economically important, will not dramatically alter, or make obsolete, the industries in which they operate.

Generally, small business owners fill market niches by offering specialized products and services to both established and underserved markets. Cumulatively, small business owners have the ability to refine their industries by introducing unique ways of solving their clients' problems. Over time, small business activities can create increased efficiencies, competitiveness, and market choices, as large competitors, and eventually industries, adopt the specialized services that are the small business owners' competitive advantage. A small payroll company's mobile job-costing accounting method, which allows a construction foreman to track building expenses using a hand held PDA, is an example of a small business generated advancement that will eventually be adopted by its industry.

On a national or macro-economic level, small business owners are price takers, or "an economic agent that makes decisions on the assumption that these decisions will have no effect on prevailing market prices" (Nicholson, 2005). In some regional and local markets, small business owners may have the ability to affect the price and supply of the goods and services they offer. However, most small business owners argue that they must cluster their prices around those of their large competitors, with the large competitors setting market prices and most greatly affecting overall supply.

Small Business Policies

The purpose of small business policies is to promote and protect small business interests, by increasing small business formation, survival, expansion, and working to secure equitable market representation for disadvantaged groups. In 1953, when President Eisenhower founded the Small Business Administration, the SBA's expressed purpose was to "aid, counsel, assist and protect, insofar as possible, the interests of small business concerns," while also ensuring that small businesses received a "fair portion" of government contracts.⁴ In order to achieve these dual goals, there are two basic types of small business policies: 1) broader small business policies, and 2) more narrow target market equity policies.

Broad Based Small Business Policies

Broad based, small business policies seek to promote business formation by eliminating hurdles to business ownership, survival, and expansion. Similar to entrepreneurial efficiency policies, these policies work to increase business owners' ability to exploit opportunities by reducing barriers to small business growth and market entry. These policies create programs designed to address the primary constraints and obstacles individuals and small business owners face when starting, or expanding a business. These obstacles and constraints include: difficulty in obtaining long term loans or accessing working capital, the inability to meet certain industry requirements for contracts, a lack of business experience, trouble complying with industry regulations, and a lack of knowledge about their industry's best practices.

Different SBA programs address these difficulties and focus on helping small businesses obtain bank loans, surety bonds, and business counseling services, etc. The 7(a) program, created in the Small Business Act of 1953, is a broad based program that provides lending guarantees to private banks which make longer term loans to small businesses. The SBA's 7(a) lending guarantee reduces the level of risk banks assume when lending to small businesses and increases small companies' ability to obtain the money they need to finance building construction, software development, fleet expansion and other activities that can increase their productivity, profitability and hiring (Weiss, 2006).

⁴ Overview and History of the SBA: 50 Years of Service to America's Small Business, the U.S. Small Business Administration, 1953-2003, (Washington D.C.), p.1.

Similar to broad based entrepreneurship policies, many broad based small business policies focus on reducing small entities' regulatory burden. Most often, the regulatory formation and legislative process does not adequately consider how new laws and requirements will affect small business owners. The cost of new regulations, and presumed simple regulatory changes, can absorb small companies' profits and drive them out of business. Industry regulations can create effective barriers to new business entry, as firms must reach a certain size before existing regulatory costs can be spread across a large enough client base to allow a new company to enter the market. If a company cannot reach the necessary size, or level of clients needed to overcome the cost of regulatory compliance, the regulatory burden will effectively prevent some new business formaton. In this way, regulations can decrease market competitiveness and overall economic efficiency.

Narrow Target Market Equity Small Business Policies

Small business target market equity policies narrowly seek to promote the equitable distribution of economic benefits, by cultivating the formation and survival of specific types of business owners. These policies attribute low levels of business and commercial participation, and the unequal allocation of economic benefits in specific groups, to social and economic barriers that lead to low levels of business ownership. These policies argue that a country cannot continue to produce sustainable long-term development unless all sectors of the population are represented in economic growth.

Target market equity policies are carried out through programs, mandates, and federal government contract set-a-sides designed to help specific disadvantaged groups. These programs seek to sow the seeds of entrepreneurship, and bring economic development to communities, by cultivating women business owners, veteran, and disabled-veteran business owners, Alaskan Native Corporations (ANCs), and minority business owners. The Small Business Act defines socially disadvantaged groups as individuals "who have been subject to racial or ethnic prejudice or cultural bias," while economically disadvantaged individuals are defined as those "whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities."⁵

⁵ Small Business Act and Small Business Investment Act of 1958 Compliation, 109th Congress, 2nd Edition, Committee Print, S.Prt 106-62, (Washington D.C.), p. 84.

The 8(a) program, also created in the Small Business Act of 1953, was designed to help small disadvantaged businesses compete in the American economy and access the federal procurement market. Through the 8(a) program, disadvantaged small businesses can receive special government contracting preferences that are not available to other contractors. The 8(a) program creates a space within the federal procurement marketplace where disadvantaged small business owners compete only against each other enabling their businesses to take-hold and grow. Because of these contracts, the number and prevalence of minority and other targeted business owners can increase within targeted communities. The 8(a) program represents the classic type of post World War II policy that sought to protect small businesses from monopoly competitors (Weiss, 2006).

Included in these target market equity policies are economic development and revitalization policies that seek to promote business formation in economically blighted areas. Many small business owners take advantage of the tax incentives, and other contracting enticements, offered to small businesses that operate and hire in designated financially distressed communities. These policies seek to spur small business ownership in a specific location based on the area's economic status instead of categories such as gender or race. These policies also seek to foster strong small businesses within distressed communities as a way to pull up, or economically develop, struggling areas (Weiss, 2006).

2.2.4 Questions Measuring Policies' Equity or Efficiency and Narrow, Moderate, and Broad Based Benefits

This chapter ranks each major small business and entrepreneurship policy on a continuum between target market equity and economic efficiency. To create this continuum, each policy is scored on its ability to fulfill the goal of target market equity or economic efficiency. A policy's final score is determined by summing the individual scores it receives on eight questions designed to determine the policy's intent and beneficiaries. Four of the questions seek to establish if the policy fulfill target market equity goals. Four questions seek to establish if the policy fulfills economic efficiency goals. The questions also seek to determine if a policy provides narrow or broad benefits to groups. Two questions in the economic efficiency category, and two questions in the target market equity category, seek to determine if the policy provides narrow benefits. Two of the questions in the economic efficiency category, and two of the questions in the target

market equity category, seek to determine if the policy provides broad based economic benefits.

Each target market equity question can receive a high score of -3 for “highly supports the goal of target market equity,” a middle score of -2 for “somewhat supports the goal,” or a low score of -1 for “provides a little support to the goal.” The first two target market equity questions seek to determine if the policy provides narrow benefits to a selected group of small business beneficiaries, while the next two questions seek to determine if the policy provides more broad benefits to small businesses.

Each economic efficiency question can receive a high score of +3 for “highly supports the goal of economic efficiency,” a middle score of +2 for “somewhat supports,” or a low score of +1 for provides “a little support to the goal.” Two questions establish if the policy creates increased economic efficiency for a more narrow set of beneficiaries, and two questions focus on if the policy broadly creates broad based economic efficiency for the majority of companies. Questions that do not apply to a policy receive a score of 0. The major small business and entrepreneurship policies enacted between 1977 and 2001 range in score between -5 for the lowest score on the target market equity side of the continuum, to +6 for the highest score on the economic efficiency side of the continuum. Policies are ordered by score and can be seen in table 1. The scores for each policy are available in the appendix in table 3.

Each policy’s scope, or ability to generate economic benefits for companies, will vary. Though the evaluation questions seek to determine narrow or broad benefits, the scope of actually policy beneficiaries is more nuanced. Consequently, policies are divided into those that narrowly benefit a few companies, policies that are more moderate in scope benefiting more companies, and policies that are broad in scope creating the highest level of economic benefits for companies. A policy’s scope is determined based on its total score. Policies with a score of -6, -5, +1 and +2 are narrow in scope. Policies with a score of -4, -3, +3, and +4 are moderate in their scope of benefits. Policies with a score of -2, -1, 0, +5 and +6 create broad based benefits. Table 2 provides a visual comparison of the eighteen policies this chapter evaluates. Policies are listed in the table 2 by score and then by date.

The 4 questions for determining a policy's target market equity are***Narrow***

1. To what degree does the policy narrowly provide targeted federal aid, contracts, or other types of governmental assistance to small business owners, based on specific characteristics such as gender, race, veterans', disabled or economic status in order to increase these groups' market participation and total overall economic output?
2. To what degree does the policy seek to narrowly promote entrepreneurship in a specific industry sector, like technology entrepreneurship, or the development of advanced technologies, by providing targeted federal benefits, aid, or other types of assistance to that sector?

Broad

3. To what degree does the policy broadly promote small business formation, and survival, by reducing barriers to small business financing, or providing technical assistance, and counseling to small business owners?
4. To what degree does the policy seek to broadly reduce barriers to market entry, or reduce small business owners' regulatory or compliance burdens?

The 4 questions for determining a policy's economic efficiency are***Narrow***

- A. To what degree does the policy narrowly focus on barriers to competitiveness, such as reducing industry level regulatory requirements, or increasing technology transfer, where one industry will most prominently benefit from these federal actions?
- B. To what degree does this policy narrowly aim to increase economic efficiency and total output by promoting specific types of activities, such as R&D or technology commercialization, in order to produce innovations and advancements?

Broad

- C. To what degree does this policy broadly reduce barriers to market entry, and increase market efficiency and competition, by eliminating domestic and international trade restrictions, legal, and lending restrictions, that will broadly benefit businesses and entrepreneurs across industries?
- D. To what degree does this policy broadly increase competition by increasing the majority of entrepreneurs' and business owners' desire and capability to pursue opportunities within the economy ?

2.3 Part 2 The Presidential Administrations**2.3.1 Historical Context**

Carl Schramm, an economist and the CEO of the Kaufman Foundation, argues that since the great depression the economic ideas of John Maynard Keynes, Joseph Schumpeter, Max Weber, and others have affected the planning and perception of how the modern economy creates growth and innovation. Keynesian ideas and policies' contend that U.S. economic growth and technological development, like monetary and budgetary policy, should be centrally planned and controlled. Other economists, like Schumpeter and Weber, rejected central planning. They feared that centrally managed government economies would favor big businesses over new and smaller entities leaving little room for the entrepreneurship, chance, and risk taking that leads to technological advancement, creative destruction, and economic renewal (Schramm, 2006-a).

The conflict between a centrally planed economic model and a more decentralized model played out during the Cold War. Though the U.S. opposed the communist political system, many believe that the Soviet model of centralized planning created superior efficiency, innovations, and economic growth. Like the Soviets, the U.S. government sought to centrally manage industrial output by allowing a few industrial leaders to concentrate ownership and create the economies of scale necessary for mass production. In this iron triangle, large unions checked the power of industrialists, and a strong bureaucratic federal government used regulatory policy to constrain both big business and big unions. Combined, these three powerful, countervailing forces set the direction of the U.S. economy and were considered the drivers of economic and

technological progress. Many policy makers believed that government defense and big industry research generated the majority of technological advancements, new products, and other innovations available in U.S. markets (Acs and Audertsch, 2001).

During much of the Cold War, small firms were considered a drag on the U.S. economy. Many believed that small business ownership was a luxury the U.S. maintained to promote internal democracy, as small business owners were active democratic participants that tended to reject communist ideals. The decentralized, creative efforts of entrepreneurs were not seen as a source of innovation and small businesses were not considered essential to U.S. competitiveness and economic growth. Instead, small firms' dispersed efforts were considered to reduce the overall effectiveness of U.S. economic management and planning (Acs and Audertsch, 2001).

The struggle between these two sets of economic ideas, that the government should create planned, stable, economic growth, or that entrepreneurship's disruptive process is necessary to create dynamic, technologically advanced economies, continued throughout the Carter to Clinton presidencies. During these administrations, many policies placed the federal government in charge of fostering specific kinds of entrepreneurial activities, technology transfer, R&D, and certain types of business ownership. Other policies worked to reduce government control and influence in the economy, by opening up markets, deregulating industries, and codifying international trade agreements.

2.3.2 Jimmy Carter (1977 - 1981)

Economic and Policy Overview

During the four years that Jimmy Carters was in office, he would face increasing world oil prices, climbing inflation and decreasing American productivity. Japan emerged as an industrial power creating a burgeoning trade imbalance (Carter, 1978). The U.S. inflation rate ranged from 6.5 percent in 1977, to a high of 13.58 percent in 1980,⁶ when oil prices more

⁶ All inflation statistics in this chapter are from www.InflationData.com. "Historical Inflation Data from 1914 to the Present." Based on the Bureau of Labor Statistics consumer price index with 1982 base of 100.

than doubled. The national unemployment rate was above 6 percent for three out of four years of his presidency.⁷

Carter supported deregulating many industries. In 1980, he wrote that, “I have vigorously promoted a basic approach to regulatory reform; unnecessary regulation, however rooted in tradition, should be dismantled and the role of competition expanded.”⁸ He promoted deregulating the airline, trucking, banking, financial services and the communications sectors arguing that deregulation would “spur to innovation and the increased flexibility that comes from opening up these industries to the fresh winds of competition.”⁹

Out of concerns that the U.S. was falling behind Japan, in terms of technological advancements, exports, and worker productivity, the Carter administration developed a set of policies designed to increase U.S. industrial output and efficiency. These policies were presented in President Carter’s Domestic Policy Review on Industrial Innovation (DPR). Among other recommendations, the DPR proposed increasing technological transfer between government and industry, reforming the patent system, fostering small innovative businesses through government investment in start-up companies, and increasing funding for innovations (Turner, 2006).

Carter Administration Major Entrepreneurship and Small Business Policies

1979 - Changes to the Prudent Man Rule: The 1979, change in the Employee Retirement Income Securities Act’s (ERISA) “prudent man” rule made it possible for pension fund managers to direct up to 10 percent of their assets into venture capital investments. Prior to 1979, the “prudent man” rule restricted fund managers from investing pension funds in “high risk” investments, such as providing venture capital funding for start-up companies (Gompers, 1994).

⁷ All unemployment statistics in this chapter are from the U.S. Department of Labor Bureau of Labor Statistics. Not seasonally adjusted unemployment rate – series id: LNU04000000, 1977 to 2006. From <http://www.data.bls.gov>

⁸ Jimmy Carter, Economic Report of the President, accompanying the 1980 Council of Economic Advisors Report to Congress. (Washington, D.C.: January 30, 1980), p. 12. From <http://fraser.stlouisfed.org/publications/ERP/>

⁹ Jimmy Carter, Economic Report of the President, accompanying the 1981 Council of Economic Advisors Report to Congress. (Washington, D.C.: January 17, 1981), p. 7. From <http://fraser.stlouisfed.org/publications/ERP/>

The change in the prudent man rule expanded the options pension managers had for diversifying portfolios, and increased the return on investments by allowing a greater number of companies to compete for money from pension funds. This expanded the level of investment available to emerging technology firms. Start-up companies gained access to a new source of capital to help them bring their inventions to market. By the 1990s, because of the rule change, some \$3 trillion dollars in pension assets were directed towards start-up and high-risk companies (Gompers, 1994), contributing “significantly to the expansion of the venture capital industry, which in turn has fueled entrepreneurship.”¹⁰

This regulatory change encourages entrepreneurship by funding higher risk start-up, development, and early stage activities. It receives a total score of +5, placing it on the economic efficiency side of the continuum. The prudent man rule broadly benefits venture capital investors, pension fund managers, pension holders, and the overall economy by increasing the total overall level of innovation coming to market.

1980 - Stevenson-Wydler Technology Innovation Act: The Stevenson – Wydler Act created technology transfer offices within federal laboratories and established technology centers in universities, to encourage university and business collaboration on advanced research. It also created the National Technology Medal to reward technology advancements in the public sector (Turner, 2006).

One of the primary proposals in Carter’s DPR was to increase technology transfer, and the dissemination of scientific information, between government laboratories and private enterprise (Turner, 2006). President Carter said during the Stevenson-Wydler bill signing ceremony, the Act was “designed to foster a new era of government-industry cooperation. The best inventive minds from government, industry and universities will work together... on innovative processes to increase productivity in a large number of industries.”¹¹

The Stevenson-Wydler Act can be classified as an entrepreneurship policy that spurs innovative activities by improving the federal government’s effectiveness at transferring innovative technologies from the government to the private sector. The Stevenson-Wydler Act receives a cumulative

¹⁰ David M. Hart, *Entrepreneurship Policy: What it is and Where it Came from in The Emergence of Entrepreneurship Policy*, ed. David Hart (New York: Cambridge University Press, 2003), p. 10.

¹¹ Jimmy Carter, *Stevenson-Wydler Technology Innovation Act of 1980 Statement on Signing S.1250 into Law*. October 21, 1980-b. The American Presidency Project. From www.americanpresidency.org

score of +4, placing it on the economic efficiency side of the continuum. This policy benefits a moderate range of technology companies working with government sponsored laboratories. The Act is widely cited as a catalyst for driving U.S. innovations and was one in a series of important technology entrepreneurship policies that cumulatively increased the level of total scientific output, technological development, and commercialization within the United States. Because of the Act's success it was also often revisited and revised.

1980 - Bayh-Dole Act: The Bayh-Dole Act established a standardized patent policy among federal agencies that funded scientific research. This policy allowed universities, and individuals, to retain ownership rights to the scientific advancements they developed (Government Accounting Office, 2003). Prior to the Bayh-Dole Act the federal government owned most federally funded scientific and technological discoveries. Some agencies like the National Science Foundation and the Department of Defense (DoD) granted patent rights on innovations developed with their funding. Other agencies like the National Aeronautics and Space Administration and the Department of Energy required inventions made with their support to be dedicated to public use and would not grant private ownership or exclusive commercialization rights which discouraged private action.

The Bayh-Dole Act recognized that private property rights were necessary to encourage the transfer of technology and the commercialization of scientific discoveries made in federally funded laboratories. Secure property rights provided incentives for entrepreneurs and companies to undertake the process of turning an invention into a marketable innovative product. By granting universities, small business owners, and inventors secure rights to the technological advancement they helped discover, the federal government was able to increase the efficiency and volume of technology transferred to the private sector (Bremer, 1998).

The Bayh-Dole Act can also be considered an entrepreneurial policy that increases economic efficiency by guaranteeing property rights and enabling technology transfer and commercialization. Because of the moderate number of technology companies that can benefit from this Act, it receives a total score of +4, placing it on the economic efficiency side of the continuum. As the Colorado State University's Office of Technology Transfer (OTT) explains, the Bayh – Dole Act has “helped to spawn new businesses, create new industries and open new markets.... (these) University-industry collaborations have helped to move new discoveries from the lab to the marketplace faster and more efficiently than ever before

– ensuring that products and services based on federally funded research reach the public.”¹²

1980 - Regulatory Flexibility Act: The Regulatory Flexibility Act (RegFlex) requires that agencies prepare a Regulatory Flexibility Analysis of any proposed rules that would have a significant economic impact on small enterprises. Agencies are required to show how they considered small entities needs during the rule making process and to establish “differing compliance or reporting requirements or timetables that take into account the resources available to small entities.”¹³ The SBA is charged with assuring that other executive agencies comply with the RegFlex.

The Regulatory Flexibility Act is a small business target market equity policy. It receives a total score of 0, placing it at a neutral position between achieving the goals of target market and economic efficiency. This neutral score recognizes that small companies are the RegFlex Act’s primary beneficiaries. However, because RegFlex works to reduce the regulatory burden small businesses must bear, the Act helps to increase overall economic efficiency. These characteristics pull it toward the economic efficiency pole, enabling it to fulfill both target market equity and economic efficiency goals which broadly benefit small companies.

2.3.3 Ronald Reagan (1982 - 1989)

Economic and Policy Overview

When Ronald Reagan became president in 1982, the U.S. economy was struggling with high levels of inflation, an economic recession, and low levels of worker productivity. Additionally, increasing imports of foreign goods from Japan and elsewhere created formidable competition for U.S. manufactured goods. During his presidency, Reagan would see the U.S. economy recover, the Soviet Union economically collapse, and the Berlin Wall destroyed.

Reagan faced high levels of unemployment with that unemployment rate reaching 9.7 percent in 1982, and remaining over 6 percent for six out

¹² What is Bayh-Dole and why is it important to Technology Transfer, Technology Transfer Office, Colorado State University Research Foundation, (Fort Collins: 1999) p. 2. From: http://www.csurf.org/enews/baydole_403.html

¹³ Regulatory Flexibility Act of 1980, P.L. 96-354.

of his eight years in office. In order to control inflation, Reagan pursued a tight monetary policy that brought inflation down to 6 percent in his first year and kept it below 5 percent during his presidency. Reagan worked to reduce the federal deficit by cutting many federal programs and benefits while increasing funding for military programs based on his deep concern about the military power of the Soviet Union.

Reagan argued that the high cost of big government stifled “the entrepreneurial spirit”¹⁴ and that the “central role of government must be to nurture this genius, not to shackle it in a morass of regulations or to tax away the incentives for innovation.”¹⁵ In contrast to previous economic theories, Reagan believed that taxes primarily affect individuals and businesses economic incentives instead of modulating supply and demand.

Reagan orchestrated tax reforms designed to increase economic incentives for business investment, entrepreneurial behavior, and savings. The Economic Recovery Tax Act of 1981 reduced all income taxes by 25 percent. In order to increase worker and business productivity, the 1981 reforms allowed businesses to use the Accelerated Cost Recovery System for deprecating business capital investments (U.S. Treasury, 2006). These tax reforms also created the R&D tax credit that enabled qualifying companies to deduct a percentage of their research expenses from their corporate income taxes (Morris, 2005). Combined, these reforms lead to a significant increase in business capital formation, by enhancing the desirability of investing in advanced technologies (U.S. Treasury, 2006) and promoting company sponsored R&D.

Reagan also supported deregulating industries and increasing the transfer of technology from the government to the private sector as another way to increase U.S. productivity and technological strength. In his 1983 annual report he argued, “For many decades the Federal Government has regulated the price and entry conditions affecting several sectors of the American economy. Much of this regulation is no longer appropriate.... Over time, most of this regulation – by restraining competition and the

¹⁴ Ronald Reagan, Economic Report of the President, accompanying the 1988 Council of Economic Advisors Report to Congress. (Washington, D.C.: February 19, 1988.), p. 7. From <http://fraser.stlouisfed.org/publications/ERP/>

¹⁵ Ronald Reagan, Economic Report of the President, accompanying the 1989 Council of Economic Advisors Report to Congress. (Washington, D.C.: January 10, 1989.), p. 7. From <http://fraser.stlouisfed.org/publications/ERP/>

development of new services and technologies – has not served the interests of either consumers or producers.”¹⁶

Reagan Administration Major Entrepreneurship and Small Business Policies

1980 - Small Business Innovative Research: The 1980, Small Innovative Development Act established the Small Business Innovative Research (SBIR) program. The SBIR program enables small entrepreneurs to compete for R&D funding from government agencies. The program requires each agency to set aside specific research funding to be used by SBIR program participants to develop and commercialize technologies that meet defined agency needs. Any business owner who is a U.S. citizen and has fewer than 500 employees can compete to win SBIR agency funding.

Companies participating in the SBIR program can compete for phase I grants. Grant winners use their awards to conduct a feasibility study into developing and making market-ready a specific type of technology. Phase I winners can compete for phase II grants, which provide them additional money to help the company develop the idea’s technical merit, feasibility, manufacturing and marketing strategy. The SBIR program provides an important form of competitive financing to companies at the early stage of developing new products for the communications, health care, and defense markets. Through the SBIR program new entrepreneurial companies can “overcome barriers to investment for promising, high spillover technologies” (National Academies, 2004).

The SBIR program receives a cumulative score of -2, placing it on the target market equity side of the continuum. This policy is unique in that most policies that spur entrepreneurship have a positive score ranking on the economic efficiency side of the continuum. However, even though the SBIR program is competitive it ultimately only provides benefits to a number of small technology entrepreneurs, which pulls it toward the target market equity pole.

1984 - The National Cooperative Research Act: The National Cooperative Research Act (NCRA) enables companies to enter into joint R&D ventures. The NCRA limited the damage awards plaintiffs could win by bringing antitrust suits against company joint ventures. Prior to the NCRA, the ability to receive tremble damages, defines as an exponential amount above real damages, made joint venture lawsuits very profitable

¹⁶ Ronald Reagan, Economic Report of the President, accompanying the 1983 Council of Economic Advisors Report to Congress. (Washington, D.C.: February 2, 1983.), 6. From <http://fraser.stlouisfed.org/publications/ERP/>

for lawyers and private parties. The prevalence of antitrust lawsuits against joint ventures discouraged combined research and partnerships between firms within the same industry or across industries (Turner, 2006).

The NCRA's purpose was to generate technological advancements through R&D by promoting industry partnerships and joint ventures (THOMAS.gov, 1984). The NCRA was specifically passed to help the young U.S. semiconductor industry compete with the Japanese in the random access memory market. The Act resulted in computer consortiums like the Semiconductor Research Corporation known as SEMATECH. The NCRA freed businesses to undertake joint research, development, manufacturing, and commercialization functions together, and helped to increase the rate of U.S. technological advancements and responsiveness (Turner, 2006).

The NCRA is an entrepreneurship policy that increases the overall possible output in competitive sectors by reducing the legal disincentives for R&D joint ventures. The policy receives an overall score of +4, placing it on the economic efficiency side of the continuum. Even though the policy was written specifically to help semiconductor industry, its moderate benefits are not limited to semiconductors or the technology and computer sector.

1984 - The Hatch-Waxman Act: The Hatch-Waxman Act created an abbreviated approval process for pharmaceutical companies seeking to market generic drugs. The Act also provided large drug makers with a patent extension on new drugs equal to the amount of time it took for the Food and Drug Administration to approve new drug formulas (Lichtenberg, 2004).

This reform allowed generic drug makers to conduct clinical tests, demonstrating that their generic drug was the bioequivalent of a name brand drug formula, before the original patent on the brand name drug expired. Previous to the Hatch-Waxman Act, a Federal Court of Appeals had ruled that generic drug manufacturers violated patent law if they conducted bioequivalence tests of generic drug formulas before the brand name patent expired. This limited generic drug makers' ability to develop generic alternatives to established brand name drugs (Lichtenberg, 2004).

In 1984, President Reagan signed the Hatch-Waxman Act, to reform the pharmaceutical industry's patent extension process. These reforms were championed by President Reagan's Cabinet Council on Commerce and Trade and were also suggested in President Carter's DPR (Mossinghoff, 1998). The legislation aimed to increase the supply of generic drugs available to consumers by increasing competition in the generic drug industry. Economist Frank Lichtenberg argues that these pharmaceutical

patent reforms opened the generic drug market up to competition and new pharmaceutical manufactures so that the “largest increases in the average number of producers occurred soon after the Hatch-Waxman Act was passed.”¹⁷

The Hatch Waxman Act is an entrepreneurship policy that through regulatory changes was able to increase the competitiveness and efficiency of the pharmaceutical industry. The policy receives an overall score of +4, placing it on the economic efficiency side of the continuum. This policy’s moderately distributed benefits are primarily captured by drug manufactures though drug consumers also enjoy the increased supply of generic drug alternatives and the ongoing development and sale of new drug formulas spurred by this policy.

1986 - National Technology Transfer Act: The National Technology Transfer Act amended the Stevenson-Wydler Act to make government operated laboratories, and all federal laboratory scientists and engineers, directly responsible for transferring federal technologies to the private sector. These activities became part of the annual performance reviews of federal laboratories and their employees (THOMAS.gov, 1986). The NTTA made it legal, and simple, for government laboratories to work with private parties on research projects. The law allowed joint activities to occur without requiring all participants to first comply with complex federal contracting regulations, or negotiate formal contracts.

Because of the NTTA, government laboratories could work on collaborative research projects almost immediately after entering into a Cooperative Research and Development Agreement (CRADA) with a private company. The NTTA also enabled laboratory employees, whose work led to the commercialization of a specific innovation, to share in the profits of the commercialized product (Turner, 2006).

The NTTA is an entrepreneurial policy that promotes the efficient transfer of federal technologies to the private sector by increasing federal employees’ incentives to actively participate in the commercialization of new technologies. The NTTA increases the overall effectiveness of technology development and private commercialization for an overall score of +3, placing it on the economic efficiency side of the continuum. The NTTA is similar to other technology transfer policies with a +3 score in that the moderate level of economic benefits it creates are mostly harvested by technology companies working with the Federal government.

¹⁷ Frank R. Lichtenberg, Public Policy and Innovation in the U.S. Pharmaceutical Industry” in *Public Policy and the Economics of Entrepreneurship* ed. Douglas Holtz-Eakin and Harvey S. Rosen (Cambridge: MIT Press, 2004), p. 95.

1988 - The Manufacturing Extension Partnership: In order to help domestic manufacturing companies, a provision in the 1988 Omnibus Trade and Competitiveness Act sought to increase the technology transfer from the federal government to small and medium size manufactures. The provision established the Manufacturing Extension Partnership (MEP) under the Commerce Department, and directed the MEP to set up local offices where manufactures could receive technical assistance (Schacht, 2006).

The Commerce Department's National Institute of Standards and Technology was directed to develop many of the technologies that small and midsized manufactures access through the MEP program. The purpose of this assistance is to enable small manufactures to reduce costs, increase their product lines, and continue to compete in the international markets. In order to keep small manufactures from becoming obsolete, the MEP helps them more quickly adapt their product designs to changes in demand by adopting advanced technologies and techniques. (Schacht, 2006).

During the 1980s, U.S. manufactures lost ground to foreign made goods in the primary metals, food production, textiles and apparel industries, leading to the closing of U.S. manufacturing plants and massive layoffs of domestic manufacturing workers. Many policy makers believed that small manufacturing companies' lack of advanced technology made it difficult for them to compete against foreign imports (Cooney, Gleb, and Pirog, 2005).

The MEP is a targeted small business relief program that seeks to increase the profitability of individual businesses by promoting efficiency and competitiveness in the manufacturing sector. The goal of the MEP is to increase the overall competitiveness of small and medium sized U.S. manufactures. The policy receives a cumulative score of -3, placing it on the target market equity side of the continuum. This policy's benefits are directed at a moderate number small and medium sized domestic manufactures. Since inception, the MEP is reported to have assisted more than 184,000 companies. Smaller and newer businesses received the biggest boost in performance from MEP assistance. Additionally, manufacturing companies that use the MEP centers demonstrate greater labor productivity than non-participating manufacturing firms (Schacht, 2006).

1989 - National Institute of Standards and Technology Authorization: The National Institute of Standards and Technology Act (NISTA) established within the Department of Commerce the Technology Administration, and placed this new administration in charge of directing the National Institute of Standards and Technology, the National Technical

Information Service, and the Office of Technology Policy, to help advanced technologies prosper the U.S. economy (THOMAS.gov, 1989).

The NISTA sought to encourage other countries to adopt U.S. technology standards, as well as the transfer of technologies to other countries that were receiving aid from the U.S. government. The Act allowed for other types of contractual rights, besides patent rights, for intellectual property developed through cooperative R&D agreements. It made software developers, and guest inventors eligible for compensation and royalties from products that were commercialized because of their work in federally sponsored laboratories (THOMAS.gov, 1989).

NISTA is an entrepreneurship policy that seeks to create market efficiency and market dominance, by making U.S. technology structures the world standard. U.S. technology companies and the U.S. economy both benefit from the adoption and proliferation of these standards. This policy receives a cumulative score of +3, placing it on the economic efficiency side of the continuum. Though it is debatable if NISTA caused this proliferation, the success and ubiquitous nature of the technologies developed by companies like Microsoft, IBM, and Intel have made many U.S. technology standards the worldwide standard.

2.3.4 George H.W. Bush (1989 - 1993)

Economic and Policy Review

During his Presidency, George H.W. Bush saw the Savings and Loan crisis, Iraq's invasion of Kuwait, and the Gulf War. Inflation remained low throughout his presidency though in 1990, because of war induced increases in oil prices, inflation rose above 5 percent. Unemployment levels remained above 6 percent three out of his four years in office. Bush argued that "a lower capital gains tax rate would encourage entrepreneurial activity" leading to the creation of new jobs, products and means of production.¹⁸ He worked to expand trade internationally, concentrating his efforts on establishing a free trade agreement between the U.S., Mexico, and Canada.

Bush believed that the private sector, and not the government, created economic growth. He was interested in policies that fostered competition

¹⁸ George H.W. Bush, Economic Report of the President, accompanying the 1991 Council of Economic Advisors Report to Congress. (Washington, D.C.: February 12, 1991), p. 5. From <http://fraser.stlouisfed.org/publications/ERP/>

and free markets. He did not believe that the government should pick economic winners or losers, stating “attempts to second-guess the market and to direct government support to particular firms, industries, or technologies in the name of promoting growth are inevitably counter-productive.”¹⁹

Bush wanted to reform industries and open them up to competition. He supported policy efforts to deregulate the banking industry. He opposed re-regulating the energy market after the world oil shocks of 1990. He proposed trading air quality credits, so that economic forces could be introduced into the energy consumption as a way to meet environmental regulations (Bush, 1990). He argued for additional regulatory reform, stating, and “The improved performance of U.S. markets that were deregulated during the 1980s shows clearly that government interference with the competitive private market inflates prices, retards innovation, slows growth, and eliminates jobs.”²⁰

H.W. Bush Administration Major Entrepreneurship and Small Business Policies

1991 - The Mentor-Protégé Program: During the Bush administration, U.S. manufactures continued to face heavy international competition. Provisions within the Fiscal Year 1991 Defense Authorization Act sought to increase federal technology transfer, by providing mentors directly to small businesses in order to help build small contractors’ capacity and increase technology transfer to small defense firms. The Act directed federal laboratories, and federally funded R&D centers, to actively seek contracts, partnerships and cooperatives or joint activities with small business firms in order to increase small business participation in federal technology transfer programs (THOMAS.gov, 1991).

The Act also created the Mentor-Protégé program within the DoD. The purpose of the Mentor-Protégé program was to increase small firms contracting capacity by allowing them to learn from the expertise and experience of large contractors. In the program, large contractors, or mentors, help protégé companies, or 8(a) disadvantaged small businesses, to receive and fulfill DoD subcontracts. Large contractor mentors are

¹⁹ George H.W. Bush, Economic Report of the President, accompanying the 1990 Council of Economic Advisors Report to Congress. (Washington, D.C.: February 6, 1990.), p.6. From <http://fraser.stlouisfed.org/publications/ERP/>

²⁰ George H.W. Bush, Economic Report of the President, accompanying the 1990 Council of Economic Advisors Report to Congress. (Washington, D.C.: February 6, 1990), p. 6. From <http://fraser.stlouisfed.org/publications/ERP/>

compensated for the capacity building work they perform with their protégé small disadvantage business partners (THOMAS.gov, 1991).

The Mentor-Protégé program is a classic small business target market equity policy. It narrowly benefits a few contracting companies, as it builds the ability of minority, veterans, and women owned firms to secure and fulfill federal subcontracts. The policy receives the furthest overall score of -5, on the target market equity side of the continuum because of the concentrated benefits it provides to the participating companies based on 8(a) qualification requirements.

1992 - Small Business Technology Transfer Program: The Small Business Technology Transfer (STTR) Program was designed to create partnerships between small businesses and federal research laboratories. Through the program, small businesses were able to pursue high tech research in tandem with a research laboratory. Small companies could use these R&D partnerships to develop the technology they needed to make specific advancements in their businesses that they would be unlikely to develop without program participation. The Act required federal agencies with R&D budgets over a specific amount, to reserve a portion of its funding for the STTR program (THOMAS.gov, 1992). The STTR program was modeled on the SBIR program created under President Reagan.

The STTR program is a small business target market equity program. The program receives an overall score of -3, placing it on the target market equity side of the continuum. This is the same score as the SBIR program and the MEP program. The benefits of the program are concentrated on the moderate number of small businesses that use federal laboratories for needed R&D. Through this research small, participating companies may be able to increase their total overall market output and competitiveness.

2002 - The North American Free Trade Agreement: The North America Free Trade Agreement (NAFTA) created a free trade pact between the United States, Canada, and Mexico. The major provisions of NAFTA include the phasing out of all trade duties within fifteen years of enactment, the reduction of non-tariff barriers between Mexico and the U.S., increase intellectual property protections, as well as the elimination of other barriers to the free flow of trade between the three countries (THOMAS.gov, 1993).

President Bush signed the initial version of NAFTA on December 17th 2002. In his January 13th, 1993 annual economic report, one of his last official documents as president after he lost his reelection bid, he argued that the NAFTA accord was a forward looking agreement that would open markets, not close them, and expand trade. He declared that the agreement would create economic growth for America and her neighbors; writing that

NAFTA “is a historical achievement that offers us the opportunity to create a more prosperous and stable Western Hemisphere.”²¹

NAFTA is a classical example of an entrepreneurship policy designed to create economic efficiency, and unleash entrepreneurial activities, by eliminating barriers to trade and commerce. The policy receives the highest possible efficiency score on the continuum with a +6, because of its broad-based benefits and ability to promote competition. Cumulatively, the U.S. economy benefits from NAFTA. According to a 2003 Congressional Budget Office (CBO) study, “NAFTA increased U.S. exports to Mexico by 2.2 percent (\$1.1 billion) in 1994 - an effect that rose gradually, reaching 11.3 percent (\$10.3 billion) in 2001.”²²

2.3.5 William Clinton (1993 - 2001)

Economic and Policy Overview

During his presidency, William Clinton saw the first World Trade Center bombing, the Asian financial crisis of the late 1990s, and the end of the dotcom internet stock market boom. Clinton presided over a strong economy that achieved historically low levels of inflation and unemployment. Over his eight years in office, the annual inflation rate only once climbed above 3 percent in 2000 when it reached 3.38 percent. The national unemployment rate was also historically low, rising to above 6 percent for one year during his presidency, while four out of the eight years of his term the unemployment rate was below 5 percent annually. President Clinton supported investing in the information super highway as well as in science, technology, and education. He was in favor of raising taxes on the high-income earners, allowing middle class taxpayers to take tax deductions for education expenses, and expanding the earned income tax credit.

Throughout his presidency Clinton argued that government should be proactively involved in fixing market deficiencies. He proposed reforming the health care market, writing “my administration remains committed to

²¹ George H.W. Bush, Economic Report of the President, accompanying the 1993 Council of Economic Advisors Report to Congress. (Washington, D.C.: January 13, 1993.), p. 4. From <http://fraser.stlouisfed.org/publications/ERP/>

²² Congressional Budget Office, The Effects of NAFTA on U.S.-Mexican Trade and GDP. (Washington D.C.: May 2003), Summary xiii. From <http://www.cbo.gov>

providing health insurance coverage for every American.”²³ He believed that government should drive technology formation, arguing that the federal government’s portfolio should “support fundamental science and industry-led technology partnerships, the rapid deployment and commercialization of civilian technologies, plus the funding for technology infrastructure in transportation and communications.”²⁴

Clinton also supported the goals of NAFTA and free trade, negotiating side agreements on the environment and labor issues, before pushing for the trade pact’s ratification in late 1993. After NAFTA was signed in December of 1993, Clinton said, “Not since the end of World War II has the United States pushed to completion trade agreements of such significance as NAFTA and GATT. We’ve shown leadership by example. We’ve set forth a vision for a thriving global economy. And our trading partners, to their credit, have also rallied to that cause.”²⁵ During his presidency, the American economy was buoyed up by the increase in exports and trade created by NAFTA’s increased economic activity and expanded opportunities.

Clinton Administration Major Entrepreneurship and Small Business Policies

1994 - Interstate Banking and Branching Efficiency Act: The Riegle-Neal Interstate Banking and Branching Efficiency Act made it legal for banks to open branches in states where they were not headquartered, and purchase banks in other states (THOMAS.gov, 1994). Prior to the Act’s passage, banks were restricted in their ability to have interstate branches and locations away from their main headquarters. This requirement restricted competition in the U.S. banking markets and constrained bank lending (Black and Strahan, 2004).

The Act led to increased competition in the banking industry as larger banks bought smaller banks. The Act also directly led to an expansion in the level of commercial capital available to small and new business

²³ William Clinton, Economic Report of the President, accompanying the 1995 Council of Economic Advisors Report to Congress. (Washington, D.C.: February 13, 1995.), p. 6. From <http://fraser.stlouisfed.org/publications/ERP/>

²⁴ William Clinton, Economic Report of the President, accompanying the 1995 Council of Economic Advisors Report to Congress. (Washington, D.C.: February 13, 1995, 5.) From <http://fraser.stlouisfed.org/publications/ERP/>

²⁵ William Clinton, The President’s News Conference, December 15, 1993. The American Presidency Project. From <http://www.presidency.ucsb.edu/ws/print.php?pid=46240>

owners. Economists Sandra Black and Philip Strahan, who studied the affects of the law on U.S. banking and business start-ups, argue that increased competition and technology spurred entrepreneurship and small business ownership. They write that, “policies such as branching and interstate banking reform, which fostered competition... increased lending overall, and that this increase in lending helped entrepreneurs start businesses.”²⁶

The Banking and Branching Act is an entrepreneurial policy that creates greater economic efficiency, by increasing the competitiveness of the banking industry and increasing the level of lending available to new small companies. The policy receives a cumulative score of +5, on the economic efficiency side. Like the change to the Prudent Man rule, this policy’s broad benefits reach beyond the banking industry, and help to drive the expansion in the overall output of the U.S. economy by increasing business growth through capital lending.

1996 - The National Technology Transfer Advancement Act: The National Technology Transfer Advancement Act (NTTAA) amended the Stevenson-Wydler Act to make the procurement and regulatory process more efficient. The Act allowed the DoD to buy products already marketed to the public sector for federal government use, as long as these products met military specifications (Turner, 2006).

The NTTAA allows companies that do not normally service the government to compete using their off-the-shelf products to fulfill military procurement needs. This increased overall competition in government contracting. This entrepreneurship policy benefits a moderate level of companies by enabling producers of off-the-shelf products to sell to the federal government. The policy receives a cumulative score of +3, on the economic efficiency side of the continuum because of its ability to increase competition in federal procurement, and lower costs. The increases to federal purchasing options and efficacy also directly benefits U.S. taxpayers.

1996 - Small Business Regulatory Enforcement Fairness Act (SBREFA): The Small Business Regulatory Enforcement Fairness Act amended and updated the RegFlex Act that was passed in 1980 under President Carter. SBREFA requires agencies to a) simplify the language of federal regulation that apply to small businesses, b) encourage small businesses to participate in the regulatory formation process, c) submit new

²⁶ Sandra E. Black and Philip E. Strahan, Business Formation and the Deregulation of the Banking Industry, in Public Policy and the Economics of Entrepreneurship eds. Douglas Holtz-Eakin and Harvey S. Rosen (Cambridge: MIT Press, 2004), p. 77.

regulations for congressional review, and d) establishes local ombudsman boards designed to listen to small businesses concerns about regulations (SBA, 1996). Under SBREFA, the SBA's Office of Advocacy is responsible for monitoring the RFA and the SBREFA.

SBREFA recognized that Agencies often ignored the RFAs mandate to consider how their regulatory requirements would affect small businesses, "resulting in greater regulatory burdens on small entities than necessitated by statute."²⁷ According to an SBA Office of Advocacy's April 2006 study on regulatory costs, "firms with fewer than 20 employees annually spend \$7,647 per employee to comply with federal regulations, or 45 percent more than the \$5,282 per employee spent by firms with 500 or more employees....compliance costs for small manufactures is at least double that for medium sized and large companies."²⁸

SBREFA is a small business target market equity policy that seeks to protect small businesses from the errant effects of regulatory formation and federal rule making. Like the RegFlex Act, the policy receives a total score of 0, placing it in a neutral position between the target market equity and economic efficiency poles. Its benefits are directed toward small businesses, but are broadly spread across this group. Additionally, like the Reg Flex Act, it seeks to promote competition and business formation by curbing the negative affects of regulations on market efficiency and market entry.

1997 - Hub Zones: The Historically Underutilized Business Zones program is designed to help small business that operate in economically distressed areas. Through the HUB Zone program, small businesses that perform the majority of their contracted work with labor and supplies from within the depressed area receive federal contracting preferences. Through the Hub Zone program, small local businesses can gain experience working in the federal procurement marketplace. HUB Zone contracting preferences are based on the economic condition of the census tract area surrounding the business, and not based on 8(a) characteristics like race, gender, and veteran status (THOMAS.gov, 1997).

The HUB Zone program is a small business targeted market equity program. It receives a total score of -4, placing it on the target market equity side of the continuum. It provides federal contracting opportunities

²⁷ The Small Business Regulatory Fairness Act, Title II, P.L. 104-121, *SBA Office of Advocacy*, updated March 29, 1996. From <http://www.sba.gov/advo/laws/sbrefa.html>

²⁸ W. Mark Crain, *The Impact of Regulatory Costs on Small Firms*, SBA Office of Advoacy, No. 264, (Washington D.C.: September 2005), p. 2.

to a narrow group of beneficiaries. The policy uses the federal government's purchasing power to drive economic growth in underdeveloped rural and urban communities.

1998 - Internet Tax Freedom Act: The Internet Tax Freedom Act imposed a three-year tax moratorium on collecting taxes from goods sold over the internet in the U.S., in order to protect "the free flow of commerce via the internet."²⁹ Proponents of this legislation argued that shielding the internet from new federal taxation would encourage internet lead business formation, which could be discouraged by an uneven state-by-state imposed taxation regime. Opponents of the moratorium argue that it endangers local jurisdictions ability to collect taxes to cover community expenses.

President Clinton, in his signing statement of the ITFA, advises that "This bill will create a short-term moratorium on new and discriminatory taxes that would slow down the growth of the internet."³⁰ The long-term effects of this policy on the volume and innovativeness of e-commerce are still being determined. The internet tax moratorium was extended in November of 2004 and is currently set to expire in November of 2007.

This entrepreneurial tax legislation seeks to prevent federal taxes from taxing away the efficiency, desirability, and vibrancy of e-commerce. Due to the internet's wide reach, and proliferation across industries, the e-commerce tax legislation receives a +6, cumulative score placing it on the economic efficiency side of the continuum for spurring entrepreneurship and allowing opportunities to remain unencumbered by taxation. The ITF's broad policy benefits are constrained only by entrepreneurs' and small business owners' access to the internet. The ITF represents a type of policy, increasingly used during the 1990s and 2000s, to drive entrepreneurship and small business formation through tax incentives.

²⁹ Bill Summary, Internet Tax Freedom Act of 1998, was S. 442 and became part of H.R. 4328, 105 Congress THOMAS, Library of Congress, Washington D.C. From <http://thomas.loc.gov>

³⁰ Presidential Statement on passage of the Internet Tax Freedom Act, White House Archives, Office of the Press Secretary, October 8, 1998. From <http://govinfo.library.unt.edu/npr/library/news/10898.html>

2.4 Part 3 Analysis and Conclusions

2.4.1 Target Market Equity and Economic Efficiency Continuum Analysis

The target market equity and economic efficiency continuum reveals the deep differences between small business and entrepreneurial policies. Most of the entrepreneurial policies, which score the highest on the efficiency side of the scale, do not require ongoing congressional action, such as authorizations and appropriations, to function. However, these policies and reforms can be excruciating to pass, and may be revised in future legislation. Consequently, overhauling an industry's regulations, such as the changes enacted by the Hatch-Waxman Act or the Interstate Bank and Branching Act, can be politically complex, and extremely difficult legislatively. Regardless of the overall economic increase these regulatory reforms may create, these changes may make some companies lose their individual economic rents. These companies will block and bicker over the legislation and special interest groups will work to defeat the bill in order to protect their narrow interests. However, when industry specific and broad based regulatory reforms succeed entrepreneurs gain access to new opportunities and markets that create a rush of new innovations, advancements, and profits.

Comparatively, the ongoing legislative fight that small business policies must confront annually comes from their dependence on congressional appropriations. Most of the small business policies, on the target market equity side of the continuum, must secure congressional funding each year in order to operate and must be Congressionally reauthorized every few years. There is often strong disagreement between the House, Senate, and the Administration over appropriations levels and authorization language that bedevil these processes. However, target market equity programs have very active support from participating interest groups. Their inspirational constituent stories, and ability to generate outside public pressure, are enough to repeatedly secure congressional action. These factors make it easier to gain initial congressional approval for new small business policies and programs than it is to pass industry level regulatory reforms and other policies that increase economic efficiency.

Economic Efficiency: On the economic efficiency side of the continuum, the government's role in driving the adoption and fulfillment of these policies decreases as the scores for entrepreneurship policies positively increases. As the scores for entrepreneurship policy move from

zero towards the high end of efficiency range, the number of industry sectors, types, and sizes of companies directly benefiting from these policies also increases. The higher the cumulative score the more businesses will share in the entrepreneurial policy's broad benefits and increase the productivity and competitiveness of the U.S. economy.

The seven economic efficiency policies with a score of +3 and +4 are designed to promote technology entrepreneurship those these policies often only provide benefits to selected industries. These policies work to increase technology transfer and bring to market more of the technological advancements developed by the federal government, private research labs, and through research consortiums.

The broad based entrepreneurship policies with a +5 and +6 score work to free markets from government intervention. These policies do not favor small businesses or technology entrepreneurs over other types of businesses and industries. Instead by reducing financial, trade, and tax barriers they allow any type and size of business to access these markets. The plain market efficiency of these pure entrepreneurial policies creates opportunities in a way that companies do not need to be aware of the policy in order to reap its benefits.

Most pure entrepreneurial policies are implemented through responsive supply and demand after some type of barrier to opportunities and competition is removed. The Korean grocer, whose store caters to Hispanic and Asian immigrants, does not have to understand NAFTA, or sign up for a NAFTA program, in order to profit from this trade pact by importing Mexican style table cream, Goya canned vegetables and Herdez Salasa Casera. The small technology company trying to commercialize its unbreakable digital-security-lock does not have to understand the change in the prudent man rule in order to receive venture capital funding from a pension plan. Entrepreneurs' response to these regulatory reforms demonstrates the strength of Schumpeter's assertion that innovative entrepreneurial activities are the central driver of economic growth.

The ability of regulatory reform policies to spur entrepreneurship, increase overall market competitiveness, and small business opportunities, should help lawmakers and researchers understand the effects that undue regulations have on an entrepreneurial economy. A high regulatory burden can squelch innovation. The legislative regulatory reform process does not keep pace with the current, brisk rate of innovation occurring in the U.S. economy. Reforming existing regulation is a thorny, difficult, and sluggish process. Consequently, it is imperative that the possible negative consequences of new legislation and regulatory rules on the entrepreneurial economy are considered carefully, carefully before becoming law.

Target Market Equity: On the target market equity side of the continuum, as policy scores move away from zero towards larger negative numbers, the role of government in implementing and promoting these policies increases. As equity policies move left the number and type of beneficiaries that directly gain from these policies narrows. This is an obvious and understandable trend. The stated purpose of target market equity policies is to create greater economic access and benefits for selected groups. This purpose is based on the belief that increased access will raise these groups overall market participation and total economic output.

Of the small business policies ranked, the Mentor-Protégé program has the lowest overall score of -5, benefiting the narrowest group of program beneficiaries. The government supplies the 8(a) contracts and the technical training incentives the program uses to increase participants' contracting capabilities, capacity, and total economic production. Here the federal government is taking on the responsibility for creating the type of planned economic growth advocated by Keynes and Galbraith.

The majority of small business policies are implemented and driven through the SBA. Most small business policies require small businesses to be aware of the policy, and to act on the policy, in order to capture program benefits. A struggling paper mill owner, who is not aware of the MEP center in her area, will only benefit from the MEP manufacturing assistance policy if she actively works with a MEP center. A technology entrepreneur building a digital, ever changing, lock-code-system will not benefit from the SBIR program if he does not win a phase I or phase II SBIR research grant.

Some would argue that the government gets in the way of innovation and entrepreneurship. However, both types of federal technology transfer programs, such as the Bayh-Dole Act, and the NTTA, on the efficiency side of the scale, and the competitive small business technology development programs, such as the SBIR, and STTR programs, on the equity side of the scale, place the government in the central role of recognizing, cultivating, and promoting new technologies. Both of these sets of programs have achieved the overarching goal of increasing technologies' overall contributions to U.S. economic productivity.

Finally, though the SBA is mandated to assist the small business population, the majority of small businesses in the U.S. have little to no interaction with the SBA. Only an estimated 3 percent of small business owners and entrepreneurs participate in the SBA's lending programs (de Ruyg, 2006). A tiny fragment of U.S. small businesses and entrepreneurs actually participate in other SBA programs, or other government activities, designed to foster small business ownership or technology

entrepreneurship. The actual level of program participation is so low that the SBA and the Federal government do not calculate the annual percentage of the U.S. small business and entrepreneurship population that they reach. Because of this reality, federal tax and regulatory policies have more far reaching and lasting effects on small business ownership and entrepreneurship than target market equity policies. As one small business owner earnestly observed, “there is not a lot the Federal government can do for us small business owners, but there is a lot it can do against us.”

2.5 Conclusions

Since the 1970s small business and entrepreneurial policies have attempted to help businesses compete in an increasingly technical and global economy. Target market equity policies and economic efficiency policies were enacted to pursue and achieve these goals. If the U.S. government considers it necessary to drive small business ownership, entrepreneurship, and technology entrepreneurship, by placing itself in charge of fostering and managing technology and small business development, then it is imperative that elected officials carefully examine how new laws and regulations effect the U.S. entrepreneurial economy. It is urgent to recognize that the economic gains from policies like technology transfer, or target market equity programs, are easily eliminated by overly burdensome regulatory policies that suppress innovation, form barriers to market entry, impede new venture financing, and discourage risk-taking and entrepreneurship.

Legislatively, there are many areas that should be examined in order to facilitate a continuous increase in successful small business ownership and entrepreneurship. Three important candidates for consideration are: 1) a targeted, competitive grant program that would allow universities to compete for funds to build technology incubators, 2) broad based regulatory reform of the Sarbanes-Oxley Act of 2002, and 3) requiring the SBA to more greatly impact the majority of entrepreneurs and small business owners by mandating that the Agency dedicate significant annual resources to reducing small businesses’ regulatory burden.

2.6 Appendix A

Table 2.1. Policy Ranking by Score.

	Date	Policy	President	Target Market Equity Questions				Economic Efficiency Questions				Total
				Narrow		Broad		Narrow		Broad		
				#1	#2	#3	#4	#A	#B	#C	#D	
1	1991	Mentor Protégé: The DoD's Mentor - Protégé program.	Bush	-3	-2	-1	0	1	0	0	0	-5
2	1997	HUB Zones: HUB Zones for economically depressed areas.	Clinton	-3	0	-1	0	0	0	0	0	-4
3	1982	SBIR: Small Business Innovative Research program.	Reagan	0	-3	-2	-1	1	2	0	0	-3
4	1988	MEP: The Manufacturing Extension Partnership.	Reagan	0	-3	-3	-1	2	1	0	1	-3
5	1992	STTR: Small Business Technology Transfer Program.	Bush	0	-3	-2	-1	2	1	0	0	-3
6	1980	RegFlex: The Regulatory Flexibility Act.	Carter	0	0	0	-3	1	0	1	1	0
7	1996	SBREFA: The Small Business Regulatory Enforcement Fairness Act.	Clinton	0	0	0	-3	1	0	1	1	0
8	1986	NTTA: The National Technology Transfer Act.	Reagan	0	-3	-1	0	3	3	0	1	3
9	1989	NISTA: The National Inst. of Standards & Technology Authorization Act.	Reagan	0	-1	0	0	2	1	0	1	3
10	1996	NTTAA: The National Technology Transfer Advancement Act.	Clinton	0	0	0	-3	2	0	3	1	3
11	1980	Stevenson-Wydler: The Stevenson-Wydler Technology Innovation Act.	Carter	0	-3	-1	0	3	3	1	1	4
12	1980	Bayh-Dole: The Bayh-Dole Act.	Carter	0	-3	0	-1	3	3	1	1	4
13	1984	NCRA: The National Cooperative Research Act.	Reagan	0	0	0	-3	2	2	2	1	4
14	1984	Hatch-Waxman: The Hatch - Waxman Act.	Reagan	0	0	0	-1	3	1	0	1	4
15	1979	Prudent Man: Change in prudent man rule.	Carter	0	0	-3	-1	2	1	3	3	5
16	1994	Banking-Branching: Interstate Banking and Branching Efficiency Act.	Clinton	0	0	-3	0	3	0	2	3	5
17	1992	NAFTA: The North American Free Trade Agreement.	Bush	0	0	0	-2	2	0	3	3	6
18	1998	ITFA: The Internet Tax Freedom Act .	Clinton	0	-3	0	0	3	1	3	2	6

2.7 Appendix B

Table 2.2. Policy Impact Groupings Target Market Equity.

Narrow	Moderate	Broad
Target Market Equity		
1991: Mentor-Protégé	1982: SBIR	1980: RegFlex Act
	1988: MEP	1996: SBRFA
	1992: STTR	
	1997: Hub Zones	

Table 2.3. Policy Impact Groupings Economic Efficiency.

Narrow	Moderate	Broad
	1986: NTTA	1979: Prudent Man Rule Change
	1989: NISTA	1994: Interstate Bank & Branching
	1996: NTTAA	1992: NAFTA
	1980: Stevenson-Wydler	1998: ITFA
	1980: Bayh-Dole	
	1984: NCRA	
	1984: Hatch-Waxman	

2.8 Appendix C

Table 2.4. Equity-Efficiency Continuum.

	Producing Equity		Continuum of Goals								Producing Efficiency						
Question Score	-3		-2		-1		0	+1		+2		+3					
Degree of Support Policies Produce	Highly Supports Equity		Somewhat Supports Equity		A Little Support for Equity		Neutral	A Little Support for Efficiency		Somewhat Supports Efficiency		Highly Supports Efficiency					
Final Score	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6				
Benefits	Narrow		Moderate		Broad			Narrow		Moderate		Broad					
Policy	1991: Mentor-Protégé		1997: HUB Zones		1982: SBIR, 1988: MEP, 1992: STTR		1980: RegFlex Act, 1996: SEREFA			1986: NTTA, 1989: NISTA, 1996: NTTAA		1980: Stevenson-Wydler, 1980: Bayh-Dole, 1984: NCRAs, 1984: Hatch-Waxman		1979: Prudent Man Rule Change, 1994: Interstate Bank & Branching		1992 - NAFTA, 1998 - ITFA	

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3. The Unintended Consequences of the Sarbanes-Oxley Act on Small Business

Jiamin Wang

3.1 Introduction

In response to the Enron scandal and the subsequent exposure of the misconduct of WorldCom, Tyco and Adelphia, the Sarbanes-Oxley Act (SOX), which came into effect on July 30, 2002, aimed to restore investor confidence in the integrity of corporate disclosure and financial reporting. However, the act has not been given full consideration to its impact on the capital formation of small entrepreneurial business. With rising compliance cost and other opportunity cost of the SOX, the prospect of small public firms becomes bleak and the enforcement of the act has led to an ironic situation in that more small businesses choose to go private or go dark¹ now. Hence, so far the act seems to have dampened entrepreneurs' efforts to raise capital through the stock market and it may also raise venture capitalists' expectation on targeted start-ups and increase the difficulties of entrepreneurial firms obtaining financing.

The paper is organized as follows: Section II briefly describes the main provisions of the SOX that heavily affect small business; Section III discusses the benefits and costs of the SOX to small entrepreneurial business and how the costs have possibly outweighed the benefits for those companies; Section IV reveals the recent trend of small companies going private under the influence of SOX and how it has affected venture

¹ Leuz, Triantis and Wang (2006) differentiate firms that go private from firms that "go dark". Both types are relieved from the obligation to comply with SEC regulations and reporting requirements, but going-dark firms continue to trade on the less regulated pink-sheets and OTC market, whereas going-private firms typically undergo restructuring that concentrations ownership in the hand of management and private equity investors.

capitalists' decisions; Section V carries out a case study on the computer software industry, an industry that is generally held to have a higher concentration of small entrepreneurial and innovative firms, and through data analysis throws some light on how SOX has impacted small companies in this industry. Section VI concludes and proposes policy recommendations.

3.2 Main Provisions of the Sarbanes-Oxley Act that Affect Public Companies

William Donaldson, the chairman of U.S. Securities and Exchange Commission, stated the following themes as the principal objectives of the SOX: To strengthen and restore confidence in the accounting profession; To strengthen enforcement of the federal securities laws; To improve the "tone at the top" and executive responsibility; To improve disclosure and financial reporting; and to improve the performance of "gatekeepers" (Donaldson 2003). SOX is mainly targeted at public companies that are registered with SEC and file financial reports as required by SEC.

Titles III and IV of the SOX deal with management responsibility and enhanced financial disclosure. Section 404 particularly poses a serious threat to the survival of small business. Under this provision, a report on the company's internal control structure over financial reporting is required to be included in public companies' annual reports, which will state management's responsibility in establishing and maintaining this structure and their assessment on the effectiveness of the internal control.² The second part of Section 404 requires the external auditor to attest to the management's assessment on this matter. The rationale of Section 404 lies in that investors need accurate and reliable information to make investment and voting decisions, and a report on internal control of financial reporting reduces information asymmetry between insiders and outside shareholders especially minority shareholders. The required annual review of the internal control will urge companies to devote more resources on

² Internal control is defined as "a process, effected by an entity's board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of the following objectives: (1) effectiveness and efficiency of operations; (2) reliability of financial reporting; (3) compliance with laws and regulations" (GAO, 2006, p. 13). SEC further defines internal control over financial reporting regarding implementation of Section 404 of the SOX.

improving this system and enable the management to identify possible deficiencies and fraudulent financial reporting beforehand.

Section 302 and 906 state that for each annual and quarterly report filed with SEC, the CEO and CFO must certify the financial information in the report is fairly presented, and “the report does not contain untrue statements or omissions of a material fact resulting in a misleading report” (GAO 2006, p.11). These certification requirements together with Section 404 have considerably increased senior executives’ responsibility and diverted their attention to corporate disclosure. Moreover, Section 806 subjects management to strengthened scrutiny by protecting whistleblowing employees from reprisals.

Section 409 has dramatically increased public companies’ disclosure burden by mandating that information concerning material changes in the financial and operational conditions of the companies must be disclosed on a rapid and current basis. Under section 409, SEC has made a series of proposals such as to require current disclosure of 11 new items or events, move some items that used to be reported on a quarterly or annual basis to current basis, and accelerate the deadlines for reporting current events as well as filing quarterly and annual reports (Donaldson 2003). Section 409 aims to establish a real-time disclosure system.

Title II of the act addresses auditor independence as this issue is at the heart of the integrity of audit process. Section 201 separates the non-audit and audit services by stipulating the scope of non-audit services that a registered accounting firm is not allowed to provide to the company if this accounting firm also serves as the external auditor of that company. Such non-audit services include financial consulting and internal audit outsourcing, for example. Moreover, to ensure the impartiality and quality of the internal audit, Section 301 has required that a public company’s audit committee members must all be independent directors and Section 407 further requires the company to report periodically whether its audit committee includes at least one financial expert. To ensure the accuracy of the external audit, Section 802 requires auditors to retain specific records regarding their review of the client companies’ financial statements for seven years. This has incurred additional cost for accounting firms.

3.3 Benefits and Costs of the Sarbanes-Oxley Act to Small Entrepreneurial Business

3.3.1 Benefits of the Sarbanes-Oxley Act

Jensen and Meckling (1976), Fama and Jensen (1983) demonstrate that the separation of ownership and control gives rise to agency problems. Managers, as the agent, tend to maximize their own interests in the company, such as higher personal compensation and less working time, which is not always in line with the goals of the investors, as the principal, who aim at maximizing the market price of the shares they hold. As the firm raises equity from the capital market, the manager has the incentive to engage in wasteful expenditures because he does not bear the entire cost (Lerner 2004). He may not exert due diligence and shirk responsibility, or may engage in activities that are too risky to be accepted by the investors, thus causing moral hazards.

This problem is exacerbated by the information asymmetry between the insiders and outside shareholders, as the managers and directors are always better informed of the financial conditions of the company, whereas the investors largely rely on the limited disclosure of the financial reports to make their decisions. For minority shareholders, their cost of monitoring the management exceeds their benefits from enhanced corporate governance since the cost is entirely borne by their own whereas the benefits spill over to all the shareholders of that company, hence these shareholders have less incentive to spend their own resources to mitigate the information asymmetry.

The agent-principal problem and information asymmetry affect equity holders' willingness to provide capital, and a higher rate of return or discounted share price are usually required to counteract these problems. Furthermore, these problems are worsened for small entrepreneurial businesses.

Entrepreneurs are the set of individuals who discover, evaluate and exploit opportunities to create future goods and services (Shane and Venkataraman 2000). Entrepreneurial opportunities differ from other profit-seeking opportunities in that the former require discovery of new means-ends relationships whereas the latter only concern optimization of efficiency within the existing means-ends frameworks (Kirzner 1997). Kirzner (1997) thinks an entrepreneurial opportunity exists primarily because different members of society have made different valuations about the re-sources which have the potential to be transformed into a different

state and an entrepreneur holds the belief that the resources have not been put into their best use and are thus priced too low. Schumpeter (1934) sees exogenous shocks as sources of opportunity because technology, social and other types of changes offer a new supply of information revealing new ways of using resources in a more valuable way. However, due to variation in the knowledge corridor, difference in access to information, individual cognitive abilities and social ties, the new information is unevenly distributed among people and first grasped by those who are to become entrepreneurs (Shane and Eckhardt 2003).

Entrepreneurial opportunities also incur high risk and uncertainty. Knight (1921) distinguishes three types of uncertainties about the future: the first type could be avoided through diversification; the second type could be avoided through repeated trials and learning over time; but the third type of uncertainties which consist of a future not only unknown, but also unknowable, are the true uncertainties that entrepreneurs are confronted with and get profit as a compensation for. Sarasvathy, Dew, Velamuri and Venkataraman (2003) make a typology of entrepreneurial opportunities by the existence of demand and supply curves. In their perspective, if neither supply nor demand exists, and several economic inventions in marketing, financing, etc. are to be made in order to actualize the opportunity, true entrepreneurial opportunity is said to be created.

Because entrepreneurs base their investment on private but unverifiable information that they believe will lead to a successful venture, the investors do not know the true expected value of the venture and thus have to use the average expected value of the start-ups, which tends to be low, to make judgments. The entrepreneurial ability is not directly observable to investors, since the investors lack sufficient information to differentiate between whether an entrepreneur starts a venture because of a high probability of success or lower opportunity cost (Gifford 2003). In the latter case, it is not surprising to find that the entrepreneur's previous salary was relatively low and his career as an employee has been a failure due to education and capability deficiencies. Moreover, entrepreneurs are usually eager to protect their innovative ideas and keep them away from other potential entrepreneurs before the new product comes to market so as to prolong the product lifecycle and postpone the opportunities being exhausted by entrepreneurial competition through the diffusion of information. This consequently leads to their deliberate choice to disclose less to retain commercial secrets, which, in turn, makes investors more skeptical about the prospect of the entrepreneurial business and to make investment decision with more caution.

Likewise, investors usually perceive small entrepreneurial businesses to be less risk-averse since they do not have such great resources and

reputations to lose as larger companies, and hence have concern that entrepreneurs may gamble away their investment. This is amplified by the adverse selection problem as when investors require a higher return as compensation for higher risk. This tends to attract those businesses that do not truly want to pay back investors and crowd out others with serious business plans but that are intimidated by the investors' criteria. Hence the equity holders are always subject to a concern that they have invested in a "lemon" (Akerlof 1970) when dealing with entrepreneurial businesses, and the vicious cycle sets in when the companies that are adversely selected come up with a lower rate of return further reducing investors' average expected value of the start-ups and in turn dimming other entrepreneurs' prospect of getting financed.

That being said, the positive message SOX has sent—enhanced financial disclosure and auditor independence—certainly points in the direction of reduced information asymmetry and adverse selection, and the emphasis on management responsibility may contribute to the mitigation of the agency problem. A large theoretical literature in accounting argues that firms can benefit by committing to certain types of disclosure prior to the realization of the information to be disclosed (Engel et al. 2004). Hence entrepreneurs that promise more transparent disclosure by their compliance with SOX will be able to command higher per-share prices at an IPO, *ceteris paribus*, and investors are willing to accept this price because better disclosure reduces the cost brought by information asymmetry and agency problems; likewise, they understand that the shares they hold will also become more valuable since the liquidity premium they expect to pay when they sell their shares has also been reduced by the commitment to better disclosure (Engel et al. 2004). In this sense, SOX may bring the benefit of increasing firm value, which is particularly important for small entrepreneurial businesses, since it is those companies that are generally suffering most from information asymmetry and low investor confidence.

3.3.2 Costs of the Sarbanes-Oxley Act

However, the compliance with SOX especially Section 404 has incurred huge direct cost to public companies. A survey done by PriceWaterhouseCoopers (Collins 2003) indicates that executives believe 76% of the direct SOX cost comes from improvement of the internal control structure, including documentation, self-assessment, policy development, staff training and the application of new technology. Section 404's requirement of external auditors attesting to the management's

assessment on internal control and Section 802's requirement on auditors keeping paper trail have led to more intensive external auditing, higher risk and responsibility associated with external auditors and additional cost to accounting firms, which in turn transform into a higher audit fee billed to the company. As the complexity of preparing financial report increases, those companies that need external assistance on this matter also incur other direct SOX costs. The internal control report's statement of management's role in maintaining the effectiveness of such structure and Section 302 and 906's requirements of CEOs and CFOs certifying the accuracy of the financial reports have increased the possibility of civil and criminal penalties associated with corporate misconduct and lead managers and directors to demand higher salaries as well as directors and officers liability insurance to compensate for their rising risk.

However, the direct SOX cost could be disproportionately higher for small public entrepreneurial businesses when measured as a percentage of revenue, total assets or market capitalization. First, entrepreneurial businesses are still going through a learning process and usually lack experience and familiarity with SEC regulations and financial reporting. Their internal control systems are less developed than those of large companies and they usually lack internal accounting staff that possess the expertise to handle the complexity of the internal control structure. Hence they would have to devote more resources and attention to fix problems of internal control structure and train their accounting staff in the use of the new system. According to a survey by the U.S. Government Accountability Office (GAO 2006) on the impact of SOX on smaller public companies, 128 of the 158 small public companies (81% of respondents) that responded to the survey had hired a separate accounting firm or consultant to help them meet the requirement of Section 404, whereas large companies relied more on their own talent.

Second, small entrepreneurial businesses are usually faced with liquidity constraints and lack slack resources to separate duties and responsibilities to meet the basic requirements of an internal control system (GAO 2006). According to GAO's (2006) survey, around 60% of the small public companies that responded stated they had difficulties implementing segregation of duties because of limited resources, and many stated that they had incurred additional cost to hire a financial expert and other independent directors for their audit committees as stipulated by Section 301 and 407.

Third, SOX compliance cost constitutes a substantial fixed cost component which imposes a disproportionately heavy burden on small entrepreneurial firms as they are inherently unable to spread the cost because of their limited economies of scale (Holmstrom and Kaplan 2003).

It is operationally difficult to differentiate entrepreneurial businesses from small companies; therefore data on small public companies have been treated as a proxy to measure the effect of SOX on entrepreneurship. According to GAO’s (2006) report, of those companies that implemented Section 404 in 2004, public companies with market capitalization of \$75 million or less (defined as non-accelerated filers) paid a median of \$1.14 in audit fees for every \$100 of revenue compared to \$0.13 in audit fees for larger public companies with market capitalization greater than \$1 billion.

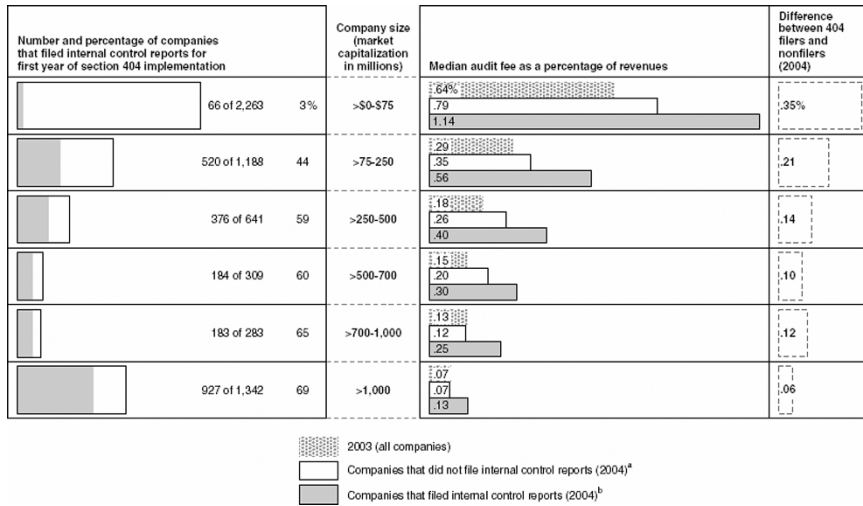


Fig. 3.1. Median audit fees as a percentage of 2003 and 2004 revenues and differences between 404 filers and non-filers (source: GAO (2006) Analysis of Audit Analytics data³.

Figure 3.1 shows the median audit fees as a percentage of 2003 and 2004 revenues reported by public companies as of August 2005 and the difference between Section 404 filers and non-filers. Small public companies with market capitalization under \$75 million have generally incurred higher audit fees as a percentage of revenues, and compliance with Section 404 has increased the size of this gap. CRA International (2005) also conducted a survey to estimate average 404 implementation cost per smaller company versus larger companies. Their results are presented in Table 3.1.

³ GAO (2006), p. 16.

Table 3.1. Year-one average Section 404 implementation cost per smaller company vs. per larger company.

	Smaller company	Larger company
Section 404 audit-related fees	\$520 k	\$1.9m
Implementation costs other than Section 404 audit-related fees	\$980 k	\$5.4 m
Total implementation costs	\$1.5 m	\$7.3 m
Average company revenue	\$324 m	\$7.9 b
Total implementation costs as a percentage of revenue	0.46%	0.09%
404 fees paid to auditors as a percentage of revenue	0.16%	0.02%

Source: CRA International (2005). Sarbanes-Oxley Section 404 Costs and Implementation Issues: Survey Update. December 2005.

CRA International (2005) has also estimated that while larger companies will undergo a 42% decline in 404 implementation costs from year one to year two, smaller companies will undergo a 39% decline, implying that the learning curve may be more efficient for larger companies than smaller companies. Given the disproportionately heavy burden of the SOX compliance cost, smaller companies tend to have more incentive to stay away from the regulations.

However, SOX has incurred other opportunity costs that may potentially impair the entrepreneurial spirit more seriously than its direct cost. Management's certification of the financial statements as stated by Section 302 and 906 and their increased responsibility on internal control systems as stated by Section 404 may divert attention from other aspects of their business, engage them in the details of financial reporting, while ignoring the development of innovative business plans and the marketing of new products thus draining away entrepreneurial talent.

SOX has created "a climate of fear"⁴ in that an executive who does not take conceivable precautions against fraud, automatically exposes himself to the risk of a personal catastrophe (Butler and Ribstein 2006). Even if the executive himself has not been involved in corporate misconduct, as long as he certified the financial report which he should have had knowledge of internal control lapses if they existed, he could suffer from civil and criminal penalties and a ruined career although his financial condition may be partly protected under D&O insurance. Managers and directors are not able to spread this risk through a diversified portfolio as their outside shareholders do and must bear the entire liability risk on their own. As a result, they may overly allocate resources to the construction of the

⁴ *Business Week*, April 24, 2005.

internal control system which exceeds the investors' desired level and creates another type of principal-agent problem (Butler and Ribstein 2006). Under the circumstance of over-compliance, R&D expense and investment in the more entrepreneurial aspects of the business may be crowded out, leaving the company enmeshed in routines.

The most chilling effect of SOX on entrepreneurship lies in its connotation that conservatism is good practice. Any novel business activities involve material change in the financial conditions of the company and may lead to uncertainty in accounting principles and thus trigger suspicion (Butler and Ribstein 2006). Consequently, the most secure way to operate the business is to avoid innovation and maintain the status quo. However, Doyle, Ge and McVay (2005) find that younger small firms and large firms that are undergoing rapid change tend to have more material control problems. The pressure SOX has imposed may induce managers of entrepreneurial firms to take excessively timid steps when making business decisions thus discouraging the entrepreneurial momentum of the company. The additional risk these companies bear may make it harder for them to find high-quality managers, directors and external auditors as these human resources may flow to larger companies that operate in a more stable environment (Butler and Ribstein 2006).

Arrow (1962) points out that knowledge, which involves and includes new ideas, can serve as a public good and its production generates externality. Apart from knowledge spillover that can intensify entrepreneurial competition and shorten the life of an entrepreneurial business, Audretsch, Keilbach and Lehmann (2006) discuss failure externality associated with entrepreneurship as positive economic value for third-party firms and individuals is created even when entrepreneurial firms fail. The high failure rate of start-ups especially knowledge-based ones are widely recognized, but the ideas and procedures created by failed firms often become an integral part of other successful firms if the latter possess superior market in-sight or management skills. However, the commercial reward is monopolized by successful firms whereas the originator of the new but un-codified idea extracts nothing from his venture. The knowledge externality and the unevenness of return on failure externalities have created incentives for entrepreneurs to protect their business innovations from leaking outside, yet the real-time disclosure system that Section 409 is aimed at threatens the monopoly of the potential lucrative opportunities discovered by the entrepreneur, as better disclosure attracts not only investors but also competitors.

The prohibition on non-audit and audit services to be undertaken by the same accounting firm as stated by Section 201 will cut off the knowledge spillover effect the external auditor enjoys through its consulting services

provided to the same company. As the auditors' knowledge base is reduced, duplication of efforts with other advisors will arise (Gifford and Howe 2004) and audit services will no longer be provided at a discounted price. A recent study shows a 58% increase in accounting costs between 2000 and 2002, which was attributed to the aftermath of Enron and the passage of SOX though its impact had not been fully felt (Asthana et al. 2004). Some small public companies have complained about their loss of financial advice due to the separation of non-audit and audit services, which may particularly stunt the growth of entrepreneurial businesses in need of external expertise for enhanced management practices.

Some scholars hold that insiders that are closely monitored may become less trustworthy as legal sanctions crowd out the motivation to be cooperative (See e.g. Frey 1997; Butler and Ribstein 2006). The stringent internal control structure SOX has imposed may lead to adversarial relationships within the firm and damage the flexibility and agility entrepreneurial businesses previously enjoyed through a vertically disintegrated firm structure and a closely knit management team held together by high levels of trust.

Last but not least, SOX will generate tremendous social cost as it weakens the competitiveness of small entrepreneurial business and their capital formation ability, and discourages potential entrepreneurs from forming new businesses because their prospect of raising capital through an IPO has been turned bleak. SOX' negative effect does not only lie in its burden on existing public companies, but also results from business that fail to be formed and entrepreneurial talent that is not realized.

3.4 The Effect of Sarbanes-Oxley Act on Entrepreneurial Business' Capital Formation

3.4.1 The Effect of Sarbanes-Oxley Act on Small Public Companies' Going-private Decision

A large literature has suggested the importance of finance to entrepreneurs seeking to start new ventures and the ease of capital formation certainly plays a role in inspiring potential entrepreneurs. Liquidity constraints create a roadblock for entrepreneurs, and individuals with more assets are more likely to succeed in new business ventures (Black and Strahan 2004). For instance, Holtz-Eakin and Rosen (1999) find that entrepreneurial activities in Germany are retarded as compared to those in the U.S. partly

because of limited access to capital. Gentry and Hubbard (2000) find that entrepreneurial households hold a substantial share of all household wealth in the U.S. Fairlie (1999) attributes minority's relatively torpid entrepreneurial activities to their lower level of wealth.

Entrepreneurial business usually gets equity financing through informal and unregulated markets such as business angel investors and venture capital funds, or regulated securities markets such as private placement of securities and public offering of securities usually through an IPO (GAO 2000). However, the cost of compliance with federal and state regulations can put serious limitations on small entrepreneurial businesses' capital formation ability in the securities market in terms of both direct and indirect costs as analyzed in Section III Part B. The enforcement of SOX will be a blessing to entrepreneurial firms only if its benefits outweigh costs. Yet small public companies tend to benefit less from enhanced investor confidence and disclosure integrity through SOX because they are more likely to be thinly traded in the stock market, have lower share turnover rates, limited liquidity and higher insider ownership, as well as due to the fact that they lack investor interest and analyst coverage. Entrepreneurial firms are vulnerable to poor stock market performance as their shares tend to be undervalued and they usually find it more difficult to continue raising capital through follow-on stock offerings. Hence, although SOX has reduced the agency problem and information asymmetry particularly associated with entrepreneurial firms, given those firms' inherent disadvantage in stock market, it is not theoretically clear whether the benefits they draw from SOX can offset the seemingly disproportionately large cost incurred.

However, empirical evidence throws some light on this issue. Since the passage of SOX in July 30, 2002, the number of going-private companies⁵ seems to have increased substantially. GAO's (2006) analysis of SEC data shows that while in 2001 there were 143 companies going private, this number rose to 245 in 2004, and the biggest increase came in 2003, when the first wave of the panic over the aftermath of SOX set in.

⁵ SEC's Rule 13E-3 defines going private transactions as "causing any class of equity securities of the issuer to be held of record by less than 300 persons." In this case, the company can cease filing reports to SEC.

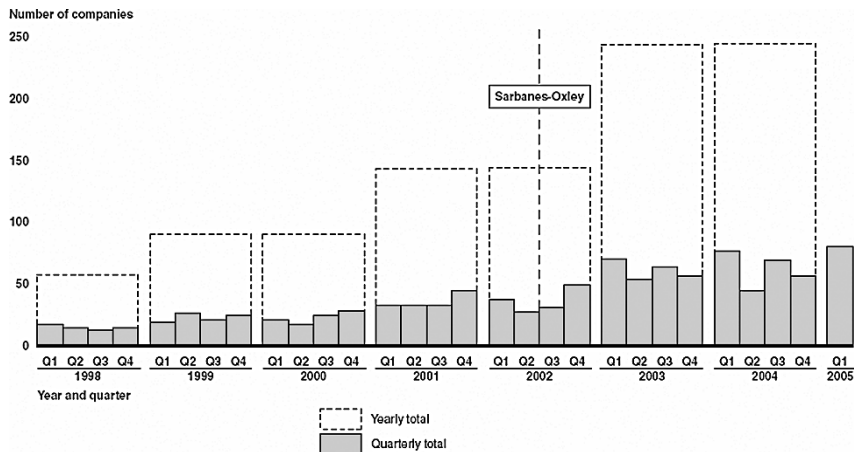


Fig. 3.2. Total Number of companies identified as going private⁶, 1998-2005 (source: GAO (2006) analysis of SEC data⁷.

Although it is practically impossible to single out the burden of SOX as the primary reason for going private, the percentage of deregistered companies that cited cost associated with maintaining public company status grew from 12% in 1998 to 62% during the first quarter of 2005 (GAO 2006). While in 2002, 64 going-private companies cited this reason; the number increased to 143 and 130 in 2003 and 2004 respectively and among them, 41% in 2003 and roughly 58% in 2004 and 2005 mentioned SOX specifically (GAO 2006). Block (2004) surveys 110 of the 236 firms that either went private or went dark between January 2001 and July 2003 and finds that the most commonly cited reason for doing so, especially for small companies, is the cost of being public, and the respondents report an average post-SOX increase in this cost of \$900,000 to \$1,954,000.

GAO's (2006) analysis also indicates that companies going private during this period were disproportionately small in terms of market capitalization, total assets and revenue, meaning that small public companies could have felt a heavier blow after SOX came into effect. This

⁶ Leuz, Triantis and Wang (2006) differentiate firms that go private from firms that "go dark" (see footnote 1). However, figure 2 does not differentiate between going-private or going-dark firms. It includes companies that deregistered, but continued to trade over pink-sheets. It does not include companies that filed for bankruptcy, were in the process of liquidating, or were headquartered in a foreign country.

⁷ GAO (2006), p. 22

is consistent with Engel, Hayes and Wang's (2004) findings. They divided companies that filed SEC Schedule 13E-3 (going-private transaction) from the first quarter of 1998 through the end of January 2004 and that had both accounting and market data into two groups: the pre-SOX sample consisting of 167 companies and the post-SOX sample with 90 companies. Table 2 presents the comparison of those two groups and it is salient that the post-SOX group is significantly smaller.

Table 3.2. Going private firms pre- and post-SOX (1998-January 2004)/(in millions USD).

	Pre-SOX sample (N=167)		Post-SOX sample (N=90)		Difference	
	Mean	Median	Mean	Median	Mean	Median
Market value	170.17	47.86	73.67	10.02	96.51**	37.84***
Sales	272.58	105.92	151.96	38.61	120.62*	67.31***
Assets	336.36	102.50	146.06	67.57	190.30**	34.93***

*** denotes statistical significance at 1% level. ** denotes statistical significance at 5% level. * denotes statistical significance at 10% level. Source: Engel, Hayes and Wang (2004).

Although operationally, the line between small companies and entrepreneurial firms remains fuzzy, it is generally accepted that entrepreneurial firms nonetheless tend to be small in size as the large companies are usually embedded in organizational inertia and are more change-resistant (see e.g. Carree and Thurik 2003; Audretsch et al. 2006; Carlsson 1989; Jovanovic 1993). The data presented in Table 3.2 may imply that as more small companies go private under the pressure of SOX, it could also make it more difficult for entrepreneurial public companies to get financing through the stock market.

Another piece of evidence comes from the trend of auditor change from the "big four" to medium and small-sized accounting firms for small public companies, as these companies may find it harder to retain the original "big four" auditors with the more intensive external audit service required by Section 404 and other provisions and subsequently the rising audit fees. Using Audit Analytics data, GAO (2006) identifies 2819 auditor changes from 2003 through 2004, and 79% were made by the smallest companies whose market capitalization fell below \$75 million. Figure 3.3 shows the average size of public companies changing auditors during this period, by type of accounting firm change (GAO 2006, p.46), and there is huge difference in size both by market capitalization or by revenue between the companies that change within the "big four" and those change from the "big four" to a second-tier or local accounting firm,

implying that small companies are more vulnerable to liquidity constraints in the post-SOX period.

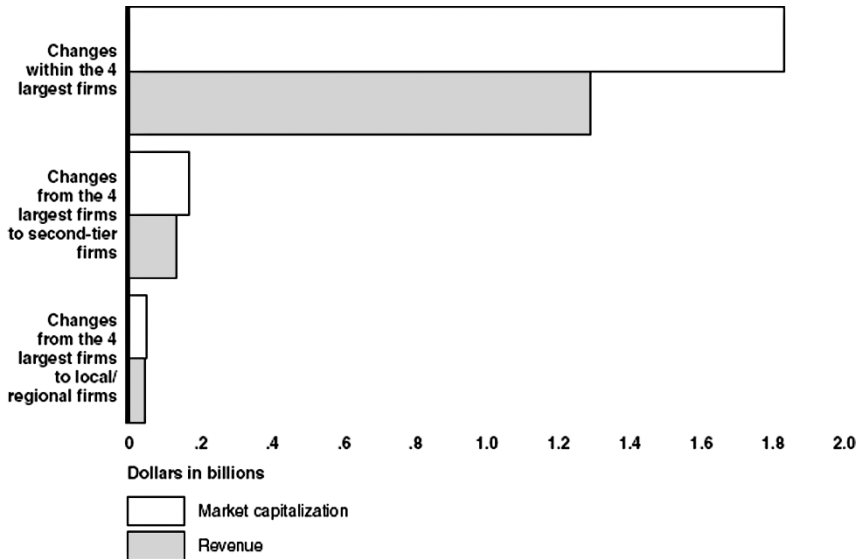


Fig. 3.3. Average size of companies changing auditors by type of accounting firm change (2003-2004)⁸. source: GAO (2006) analysis of Audit Analytics data.

3.4.2 The effect of Sarbanes-Oxley Act on Venture Capital Financing

As an entrepreneurial business grows, it enters the “seed stage” when it needs capital to prove a concept or develop a product, the “start-up stage” when it needs financing for product development and initial marketing, the “first stage” when commercial manufacturing and shipping are launched, the “second stage” and the “third stage” when expansion of production, marketing, product improvement and working capital sets in, the “bridge stage” when financing is expected to sustain major growth in a company planning to go public in six to twelve months, and finally the “exit stage” when either via IPO, merger, acquisition or liquidation, the company pays back its private equity investors (GAO 2000). Venture capital funds usually play a crucial role from the start-up stage through the bridge stage.

⁸ Figure 3 only includes those public companies with available relevant financial data.

However, in making investment decisions, venture capitalists not only consider the technological prospect of their targeted companies, but also take into account their management skills and market niche (Lerner 2004), as the latter will project the financial success of the entrepreneurial business. Compared to angel investors, venture capitalists tend to fund high-growth entrepreneurial firms at later stages which also have a longer historical performance record to track, since they expect high return and the ability to liquidate their investment within roughly five years (GAO 2000). That being said, the probability of successfully issuing an IPO is an important criterion for venture capitalists concerning their exit strategy, yet as Gompers (1995) found, out of a sample of 794 venture capital investments made over three decades, only 22.5% ultimately succeeded in going public. Moreover, considering venture capitalists' usual active monitoring of the business after they have made investment and given the limited number of firms they could actually oversee simultaneously and the fact that advising a small start-up takes no less time than a more mature one, it is easy to understand why venture capital funds lean toward investing in entrepreneurial firms that are more developed.

The implementation of SOX makes the matter worse in that it disproportionately increases the direct compliance cost of the smallest entrepreneurial firms and reduces their potential financial returns, making them less attractive candidates for venture capital funds. The tilted balance between benefits and costs of going public now makes an IPO a less appealing option for many entrepreneurs, thus disinteresting venture capitalists who seek IPO as an effective exit mechanism. Moreover, for those entrepreneurial businesses that are struggling to get venture capital financing, they now have to voluntarily comply with the spirit of SOX or at least signal their abilities to meet SOX' expectation even though they have not gone public yet, because in this way they are able to attest to the venture capitalists their potential of going public in the near future. Consequently, the implementation of SOX has impacted not only those entrepreneurial firms that have gone public, but also those that still remain in early stages, as they now have to divert a considerable portion of resources to strengthen corporate governance in advance to meet venture capitalists' more stringent selection criteria. Nonetheless, under the influence of SOX, many more venture capital funds will still flow into larger entrepreneurial firms that can afford to build financial reporting systems, leaving the more innovative but smaller ones starving for external financing as well as venture capitalists' valuable input of management expertise and advisory assistance.

3.5 Case Study: How does the Sarbanes-Oxley Act Impact Small Entrepreneurial Firms in the Computer Software Industry

The computer software industry is generally believed to be one of the most innovative industries emerging in the past decade and to have a higher concentration of small entrepreneurial firms. Therefore, a case study of this industry should be a better proxy measure of the effect of SOX on entrepreneurial firms than an investigation of small firms across all industries. The biological products industry (SIC code: 2836) and the commercial physical and biological research industry (SIC code: 8731) might also have been considered appropriate industries for this analysis; however, there were only three and four companies going private respectively in these two industries from 1999 till present, largely because most of the entrepreneurial firms in these two industries have not reached the stage of becoming a public company, hence they have to be dropped due to the sample size that is way too small.

Specifically, industry group 737, computer programming and data processing, etc., is chosen as the target industry for the analysis, and according to the information obtained from SEC's Electronic Data Gathering, Analysis and Retrieval System (EDGAR), the four-digit-code subdivisions--computer programming services (SIC code 7371), prepackaged software (SIC code 7372), computer integrated systems design (SIC code 7373) and computer processing & data preparation (SIC code 7374)--in this industry group have records of companies going private. EDGAR's records of SEC filings date back to 1994 and the author chooses 1999 till present as the time period for this particular case study, as SOX came into effect at the end of July 2002 and this time period contains roughly the same duration before and after the enactment of SOX.

The author was able to identify 37 subject companies that filed Schedule 13E-3 (going private transaction) during the post-SOX period (August 2002 till November 2006) and 24 subject companies during the pre-SOX period (January 1999-July 2002) using EDGAR's historical archives system. Industry 7372 prepackaged software seems to constitute a bulk of the going-private companies with 16 companies in the post-SOX period and 9 companies in the pre-SOX period. Because of Compustat's incomplete coverage of the smallest public companies and the author's lack of access to Audit Analytics, corporate data were hand collected from the most recent annual reports (10-K or 10KSB for smaller companies) that are available before the companies deregistered, and the audit service data were hand collected from the proxy statements.

The sizes of the going-private companies in the pre-SOX and post-SOX groups are compared in terms of market capitalization⁹. As SEC defines companies with market capitalization of less than \$75 million as the smallest public companies, attention is paid to this group so as to focus on the small entrepreneurial firms while excluding the noise of other rather big companies. Figure 3.4 shows the percentage of going-private firms by market capitalization. The results show that while 44.4% of the going-private companies in the post-SOX period have market capitalization below \$5 million, only 16.7% in the pre-SOX period do so. Although the total numbers of going-private companies with market cap under \$75 million do not differ much before and after SOX (75% in the pre-SOX period and 77.8% in the post-SOX period), the results send a pretty salient message that it is those “tiny” public companies among the small ones that disproportionately went private after the implementation of SOX.

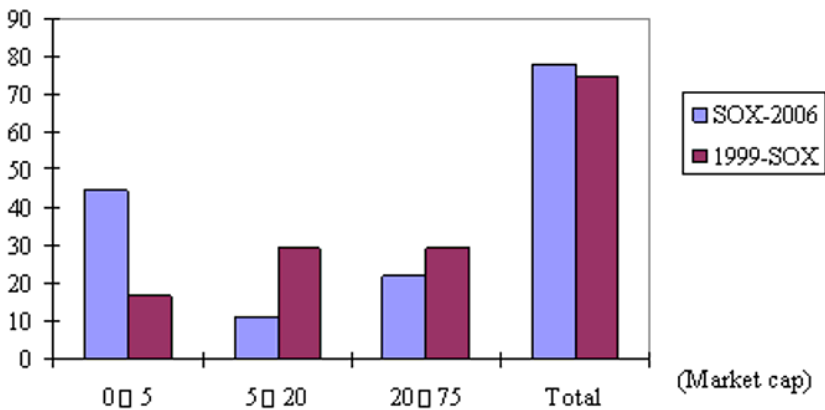


Fig. 3.4. Percentage of going-private companies by market capitalization (in millions USD).

The means of the market capitalization of the companies with market cap below \$75 million in the two groups are also compared, and while there is not much difference between the means, with the post-SOX group being 15.68 million and the pre-SOX group being 18.47 million, the median of the post-SOX group, being 4.83 million, is substantially lower

⁹ Market capitalization is defined as the current stock price times the number of outstanding common shares.

than that of the pre-SOX group, being 11.53 million, meaning that there are disproportionately many “tiny” companies in the post-SOX group. A two-sample t-test (as presented by Table 3.3) of the companies with market cap below \$20 million has also shown that the sizes of the companies in terms of market cap in the post-SOX group are smaller than those in the pre-SOX group at a statistically significance level of 5%, although this result needs to be further verified due to the small sample size. Moreover, out of the total 35 companies in the post-SOX group that have market data, 12 going-private companies used to trade in the NASDAQ small cap market instead of its national market system, a percentage of 34%, as compared to 5 companies out of the 24 in the pre-SOX groups, a percentage of 21%.

Table 3.3. Two-sample t-test of the market capitalization means of the companies with market capitalization below \$20 million (in millions USD).

Group	Observations	Mean	Std. Error
Pre-SOX	11	6.72	1.65
Post-SOX	20	3.92	0.78
Difference		2.80	1.60
Degrees of Freedom	29		
H0:	mean(0) - mean(1) = diff = 0		
	Ha: diff < 0	Ha: diff != 0	Ha: diff > 0
	t = 1.7484	t = 1.7484	t = 1.7484
	P < t = 0.9545	P > t = 0.0910	P > t = 0.0455

The author also finds that while 43.2% of the going-private companies in the post-SOX group have total assets below \$20 million, this percentage decreases to 29.2% in the pre-SOX group, meaning that in terms of total assets, there are also more, smaller companies that went private after SOX came out. Figure 3.5 shows the percentage of going-private companies by total assets.

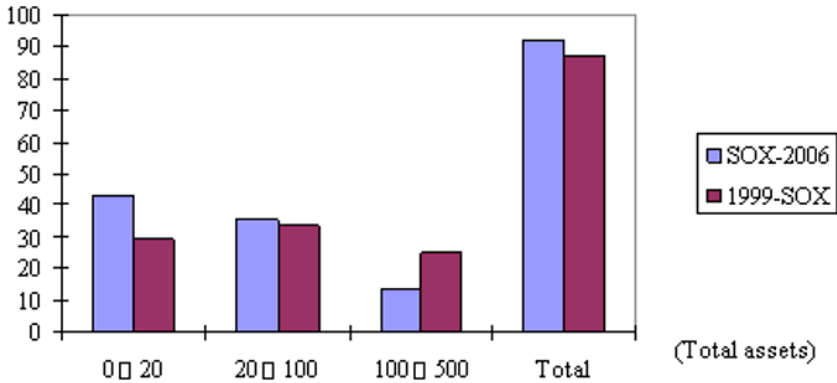


Fig. 3.5. Percentage of going-private companies by total assets (in millions USD).

Further, the companies' audit fees as a percentage of their revenues in the same year were calculated by retrieving their most recent records before deregistering with SEC¹⁰. The magnitude of audit fees is used as a proxy to measure the burden of the SOX compliance cost to public companies, as it reflects the more intensive audit services required by Section 404 and other relevant provisions. Figure 3.6 shows the average percentage of audit fees to revenues for both the post-SOX and pre-SOX groups, for each category divided by revenue.

Figure 3.6 shows that for both post-SOX and pre-SOX periods, smaller public companies have borne a disproportionately heavier burden of audit fees as a percentage to their revenues, mainly because of their inherent economies of scale disadvantage. For instance, in the post-SOX period, while the average percentage of the audit fee for companies with revenue under \$10 million amounts to 2.05%, it decreases substantially to 0.86% for companies with revenue from \$10 million to \$100 million, and 0.46% for companies with revenue from \$100 million to \$500 million. Moreover, of the 17 companies in the post-SOX group that have audit data for both

¹⁰ However, not all companies disclose their audit service data in their proxy statements or annual reports, especially those that went private in the pre-SOX period. Due to the availability of data, 27 companies out of 37 in the post-SOX group and 15 out of 24 in the pre-SOX group are included.

2001, a year before SOX, and 2003, a year after SOX, 12 of them have their audit fees increased across the two years.

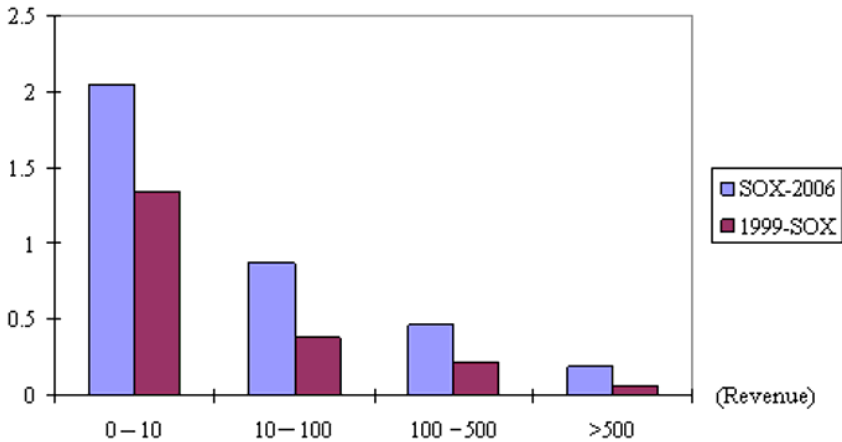


Fig. 3.6. Average percentage of audit fee to revenue by revenue size (in millions USD). source: author's analysis of SEC data.

However, the critical question is whether the enforcement of SOX has further enlarged this gap; figure 3.6 has conveyed another important message that SOX has worsened this problem. For the companies that went private in the post-SOX period, for those with revenue under \$10 million, the average percentage of audit fee to revenue has gone up by 0.71 percentage point compared to their pre-SOX counterparts; this increase goes down to 0.49 percentage point, 0.25 percentage point and 0.13 percentage point for those with revenues from \$10 million to \$100 million, from \$100 million to \$500 million, and above \$500 million, respectively. The “tiny” companies have become the biggest victim to the increased compliance cost of SOX.

Another piece of evidence comes from these going-private companies' choice of external auditor. Prior to deregistration, only 3 companies out of 24 in the pre-SOX group were audited by a non-big-four accounting firm, merely 12.5%, whereas 12 companies out of 37 in the post-SOX group were audited by a non-big-four accounting firm, which amounts to 32.4%. The difference of the two proportions is statistically significant at 5% level. What is noteworthy is that among those 12 companies, 7 actually changed their auditor from a big-four accounting firm to a second-tier or regional firm after SOX came into effect in July 2002, which throws some light on the surmise that some going-private companies in the post-SOX

period particularly experienced the pain of the increased compliance cost and had to give up their original big-four auditor despite its negative effect on the companies' reputation.

From the above data analysis, two preliminary conclusions could be drawn for the computer software industry: First, there are disproportionately more small companies that went private in the post-SOX period, and they tend to be even smaller especially in terms of market capitalization compared to their pre-SOX counterparts; Second, in the post-SOX period, small public companies have borne a disproportionately heavier burden of compliance cost measured by the percentage of audit fee to revenue, and the enforcement of SOX has further worsened this problem. These conclusions cannot be extrapolated to other industries, since the computer software industry is unique in that it has relatively higher proportion of entrepreneurial firms and its emergence is the result of the "creative destruction" of those innovative industries that bourgeoned since 1990s. It is the profiles of those companies that the author takes particular interest in because it delineates the effect of SOX not only on small companies, but more specifically, on those that tend to be more entrepreneurial and innovative.

3.6 Conclusion and Policy Recommendations

The Sarbanes-Oxley Act was enacted in the hope that it will improve corporate disclosure integrity, pull the U.S. stock market out of the shadow of the Enron Scandal, and reinforce its reputation as the most regulated securities market in the world. However, while this act is tailored for large public companies, it fails to take full consideration of the inherent characteristics of those small entrepreneurial firms that trade in the stock market, and seems to have generated negative unintended consequences on these companies. Through a theoretical analysis of both the benefits and costs of SOX, it is clear that while SOX certainly plays a positive role in reducing the agency problem and information asymmetry, the types of problems that are particularly associated with small entrepreneurial firms, it has also imposed disproportionately higher direct compliance costs on those firms, and incurred tremendous opportunity costs in that it may divert management from innovative business operations, cause lavish expenditure by over-compliance and thus potentially draining away the resources for R&D and other related activities, create an excessively risk-averse climate, make it harder for entrepreneurs to harvest the benefits of innovation because of increased knowledge externalities, reduce trust among

team members and most seriously, impact the capital formation ability of the smaller entrepreneurial firms and discourage potential entrepreneurs from starting new businesses. It has not only affected those that have already gone public, but also those that are attracting venture capital in early stages of development. Although the social cost of SOX is difficult to quantify, empirical evidence has thrown some light on its negative effects which may outweigh the positive side as more small companies went private and opted to drop a “big four” auditor after the enforcement of SOX.

A case study on the computer software industry, an industry generally accepted as propelled by entrepreneurship and innovation, has further shown that while there are disproportionately more small companies in this industry going private after SOX, they also tend to be even smaller than their pre-SOX counterparts; and the enforcement of SOX has further aggravated small companies’ compliance burden in terms of audit fees. This points in the direction that SOX may actually suppress the entrepreneurial spirit that has been serving as the engine of U.S. economic growth in the recent decade and stunt the development of entrepreneurial firms in the end.

However, several limitations of the paper should be addressed. First, while the audit fee can be used as a proxy to measure the compliance cost of SOX, it does not take into account the additional cost such as test fees for the internal control system and staff training overhead, thus it can only partially assess the direct impact of SOX. However, the feasibility of a more inclusive measure of this effect depends on the availability of data. Second, due to the small sample size of the computer software industry, the preliminary conclusions need to be further verified and further research could also examine SOX’ effects on other industries that have relatively high concentrations of entrepreneurial firms. Third, the period 1999 till present is chosen for observation, yet this period also spans the ICT meltdown. It remains unclear whether the bursting of the bubble has exerted significant influence on entrepreneurial firms’ going-private decision other than the Sarbanes-Oxley Act. Although it is technically difficult to identify the primary reason for each going-private action in the software industry unless individual survey is done, the noise of the ICT meltdown may be reduced and results may be further tested if similar research could be done to other entrepreneurial industries. Additionally, a more detailed differentiation between the going-private companies and the going-dark companies could also be made to uncover the possible different motives behind deregistration and to better understand the consequences of SOX on entrepreneurship.

All being said, the SEC may start considering more flexible rules that temporarily exempt certain types of small entrepreneurial firms from complying with SOX when they are still relatively young. After all, it is those firms that are infusing the vigor of “creative destruction” into today’s U.S. economy.

The regulatory relief may be justified not only by the overwhelming compliance burden of SOX for small entrepreneurial businesses, but also by some unique characteristics of these type of firms that may create additional advantage for effective internal control over financial reporting even without the implementation of a formal system stipulated by SOX (GAO 2006). The less hierarchical organizational structure, higher level of trust and centripetal forces within the entrepreneurial firms together with the entrepreneurs and management’s usual hands-on approach may lead to less formal and less expensive communication and control procedures while still maintaining an acceptable monitoring quality. Many Entrepreneurial firms have less complex product lines and processes and a more concentrated geographic location with less subsidiaries and branch plants. This will facilitate the supervision of financial reporting, and reduce the opportunities for fraudulent behavior which tend to take advantage of the complexity of consolidated financial statements. Additionally, it is mainly those large public companies that once fallen, will strike a devastating blow on investor confidence. Hence, concerning their higher impact on the capital market, they should be subject to tighter scrutiny compared to small entrepreneurial firms.

A paradox lies in how to make the optimal trade-off between investor protection and entrepreneurship. If too much latitude is given to the regulation and too many small companies are relieved, the protection and assurance purposes of SOX may be overridden. The “microcap” companies (currently defined by the SEC as companies with market capitalization be-low \$128 million) that have revenue below \$125 million amount to 4,641 companies, which account for almost half of all the public companies (GAO 2006). To grant regulatory relief merely based on the mechanical threshold of market cap and revenue will certainly be too broad in scope. It is particularly the entrepreneurial firms within the category of small public companies that we need to focus on, hence supplementary criteria that take into account a firm’s knowledge base, educational background, product characteristics and innovation potential should be included as well so as to make judicious judgment for a more limited and targeted range of relief.

Specifically, this could be done in two ways: first, certain industries generally considered to be relatively entrepreneurial, such as the IT industry and pharmaceutical industry or some of their more narrowly-defined

sub-industry groups, may be singled out and small companies meeting the market cap and revenue thresholds in these sectors could be given regulatory relief. But this policy approach will probably stir public suspicion on industrial discrimination and would thus be unlikely to be politically feasible. Second, whether a small entrepreneurial firm is qualified for regulatory relief may be decided on a case-by-case basis and the valid time period for the relief may also be determined individually based on the estimation of the degree of maturity of the company under concern. This approach will be expensive and time-consuming as investigation and hearings need to be carried out in each case, thus could be economically less popular. Certainly, possible solutions are not limited to these two and there is no perfect policy thus compromise need to be made.

If regulatory relief is given to small entrepreneurial firms that meet certain criteria in the future, it should be noted that some of them may have already implemented the internal control system or choose to comply with SOX voluntarily. Undoubtedly, the solution should be formulated in such a way that it encourages small companies to enhance investor protection instead of shirking this responsibility by seeking a regulatory shelter that could be a negative side-product of the regulatory relief from SOX. In this sense, firms meeting the relief criteria should be allowed to opt in and opt out depending on their perception of their own situation, and those entrepreneurial firms that decide to overcome whatever obstacles and comply with SOX may be able to signal a positive image to the market, attract more investors and be rewarded by the payoffs that could be substantial over the long run.

Moreover, the internal control system designed by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) was particularly targeted at big public companies, without fully considering the characteristics of small companies. To reduce the compliance burden, further modifications should be made to the COSO framework so as to adjust it to the need and capacity of small entrepreneurial firms. Additionally, problems could arise from the implementation of the exiting system apart from the inherent deficiencies of the system, thus more guidance and demonstration, both technical and legal, should be provided by the SEC to small entrepreneurial businesses.

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4. The Impact of Sector Specialization on Entrepreneurial Activity

Haifeng Qian and Huaqun Li

4.1 Introduction

During the last two decades, entrepreneurship has come to be perceived as “an engine of economic and social development throughout the world” (Acs and Audretsch 2003). A plethora of research has provided evidence that Entrepreneurship drives the economic growth in Germany, the United States and many other countries (Acs and Armington 2006; Audrestsch et al. 2006). However, the entrepreneurial economy appears to be based on geography (see figure 4.1). For instance, in the US the most vibrant

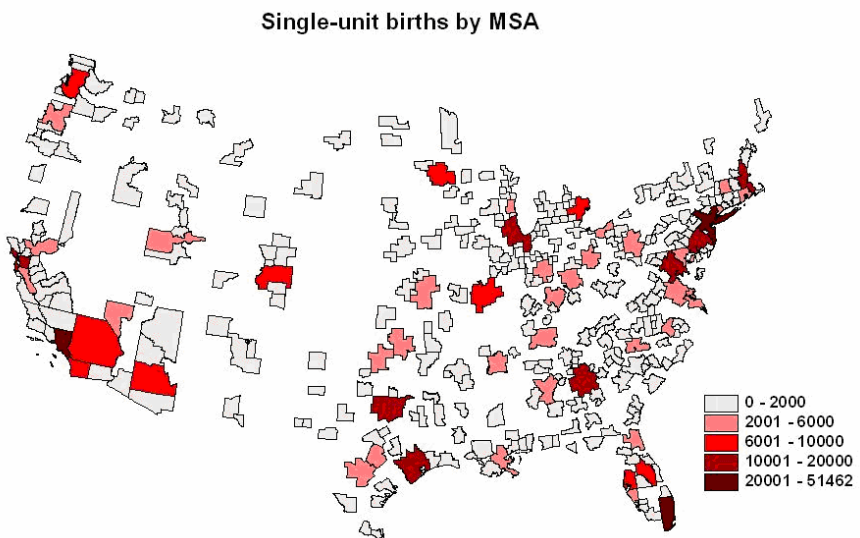


Fig. 4.1. Single-unit establishment births distribution in U.S. MSAs 2002-2003. source: U.S. Census Bureau.

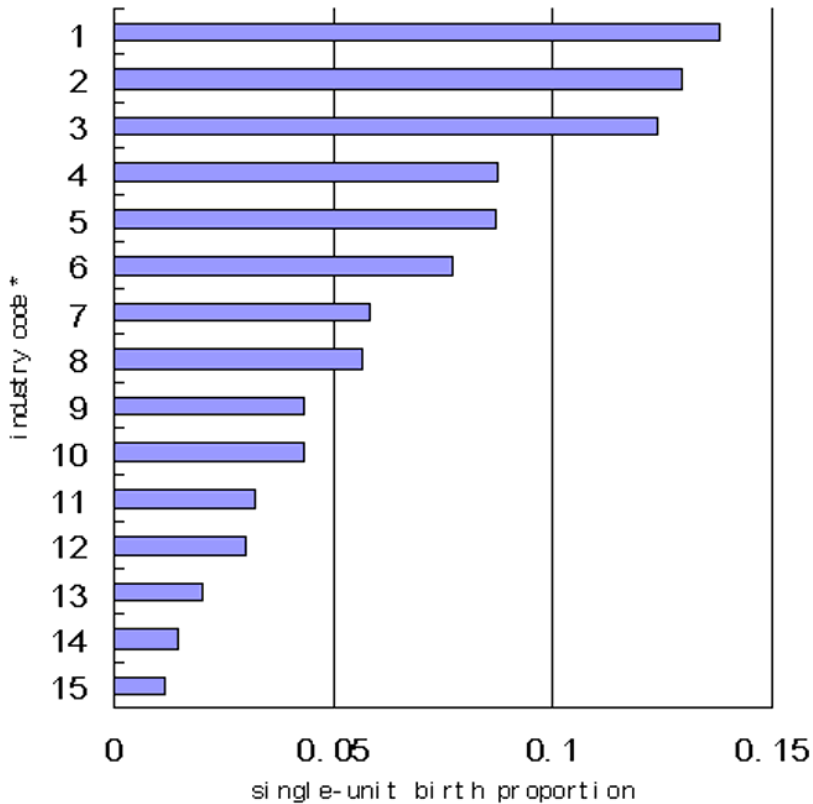


Fig. 4.2. Sector distribution of single-unit establishment births in the U.S. 2002-2003. source U.S. Census Bureau.

*Note: 1-Construction; 2-Professional, scientific, and technical services; 3-Retail Trade; 4-Accommodation and foodservices; 5-Other services (except public administration); 6-Health care and social assistance; 7- Administrative and support and waste management and remediation service; 8-Real estate and rental and leasing; 9-Finance and insurance; 10-Wholesale trade; 11-Unclassified; 12-Transportation and Warehousing; 13-Manufacturing; 14-Arts, entertainment, and recreation; 15-Information; 16-Educational services.

entrepreneurial activity is concentrated on several regions such as Silicon Valley, Route 128, Austin Texas, and Northern Virginia. As a consequence, much entrepreneurship research is conducted at the regional level (Acs 2002; Lee et al. 2004; Acs and Armington 2006; Audrestsch et al. 2006).

Besides a focus on regions, entrepreneurship scholars also address the importance of new technology in an entrepreneurial economy (Acs 2002; Acs and Armington 2006; Audrestsch et al. 2006). In their viewpoint, entrepreneurs play an important role in knowledge spillover and technology transfer. Accordingly, high-technology sectors are expected to be the hotbeds of entrepreneurial activity. Scholars have also studied entrepreneurship in some other specific industries (Murphy 1966; Peterson 1971; Clair 1980; Magee 1997). Relatively little research, however, has empirically examined how industrial structure as a whole might influence entrepreneurship. In another words, do regions specializing in some industries tend to have more entrepreneurial activity than regions specializing in others? The answer of this question could have important implications for regional industrial policy, giving that policymakers recognize the critical role of entrepreneurship in economic development. Figure 4.2 and figure 4.3 imply that sector impacts on entrepreneurial activity probably exist.

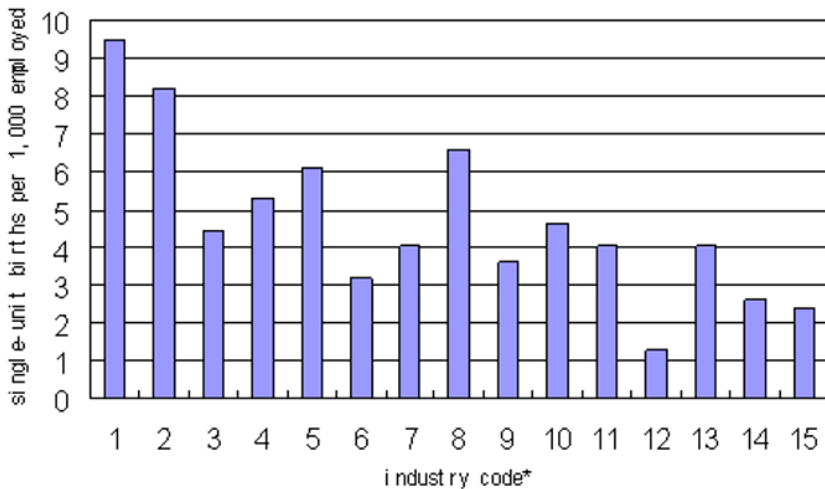


Fig. 4.3. Single-unit establishment births per 1,000 employment by industry in the U.S. 2002-2003. source: U.S. Census Bureau.

*Note: 1-Construction; 2-Professional, scientific, and technical services; 3-Retail Trade; 4-Accommodation and foodservices; 5-Other services (except public administration); 6-Health care and social assistance; 7-Administrative and support and waste management and remediation service; 8-Real estate and rental and leasing; 9-Finance and insurance; 10-Wholesale trade; 11-Unclassified; 12-Transportation and Warehousing; 13-Manufacturing; 14-Arts, entertainment, and recreation; 15-Information; 16-Educational services.

The goal of this paper, accordingly, is to empirically examine whether sector specialization affects the level of entrepreneurship activity. “Sector” is defined in terms of industry. Sector specialization refers to the distribution of economic resources among sectors in a region. The primary hypothesis is that sector specialization has an impact on entrepreneurial activity. This hypothesis is tested econometrically using a variety of economic and demographic data of the U.S. Metropolitan Statistical Areas.

The paper is organized as six parts. After this introduction and literature review parts, the third part introduces how entrepreneurship, sector specialization and some other control variables are measured and the methodology that is employed. Results and findings are analyzed in the fourth part. The fifth part discusses policy implications of the results. The paper concludes that sector specialization has a significant impact on entrepreneurial activity but to create an entrepreneurial regional economy does not necessarily require a transition from traditional sectors to newly-emerging sectors.

4.2 Literature Review

Although the concept “entrepreneurship” has been used for nearly a century, there is no scholarly consensus on what entrepreneurship represents. Entrepreneurship is always defined in terms of who the entrepreneur is and what the entrepreneur does (Venkataraman 1997). For instance, Schumpeter (1961) defines entrepreneurs as those who carry out “new combinations” in the market. A notion of entrepreneurship is derived from this definition and further linked to leadership. Similarly, Mises (1949) considers “acting man in regard to the changes occurring in the data of the market” as an entrepreneur, and human action “seen from the aspect of the uncertainty inherent in every action”¹ as entrepreneurship. Recent research on entrepreneurship, while still focusing on individuals, shifts from individual traits and personality to behavior and cognitive issues (Acs and Audretsch 2003). For instance, entrepreneurship is linked to “how, by whom, and with what effects opportunities to create future goods and services are discovered” by Shane and Venkataraman (2000). Some other scholars who focus on regions always study entrepreneurship at the firm level (Malecki 1994; Lee et al. 2004; Acs and Armington 2006; Audretsch et al. 2006) and define entrepreneurship in terms of all the new and

¹ Mises LV (1949) *Human Action*. Yale University Press, New Haven, p. 254-255.

dynamic businesses (Acs and Audretsch 2003). While this paper is an empirical study relying on region variations, firm formation is also employed to measure entrepreneurship.

Although no consensus has been reached on what entrepreneurship is, there is an increasing concern over the role of entrepreneurship in economic growth. The importance of entrepreneurship is firstly and dominantly highlighted by the Austrian economists (Mises 1949; Schumpeter 1961, 1976; Kirzner 1997). The Schumpeterian creative destruction and Kirznerian competitive market process, although from different perspectives, both underscore an entrepreneur-leading capitalist development. Traditionally, entrepreneurship was seldom seen in the mainstream economic models, although most economists admitted its importance. This however has begun to change. As an attempt to embed entrepreneurship into the mainstream economic growth theory, Acs and Armington (2006), and Audretsch et al. (2006) develop a knowledge spillover theory of entrepreneurship, resorting to the new growth theory, new economic geography, and entrepreneurship theory. According to their theory, entrepreneurs play a primary role in commercializing new technologies from either research institutions or large companies that cannot or are not willing to commercialize their research fruits themselves. This type of knowledge spillover always depends on person-to-person interactions and talent flows; therefore, geographical proximity and the regional environment have impacts on the degree to which knowledge can be commercialized. While knowledge is an endogenous driving force to economic growth (Romer 1986, 1990, 1994), entrepreneurship become exclusively important due to its role as the carrier of knowledge spillover.

Another important aspect of the knowledge spillover theory of entrepreneurship is the determinants of entrepreneurship. This concern is indispensable in that it sheds light on entrepreneurship policy making. Based on a theoretical analysis, Acs and Armington (2006) claim that “local differences in knowledge stocks, the presence of large firms as deterrents to knowledge exploitation, and an entrepreneurial culture might explain regional variations in the rates of entrepreneurial activity”². Based on this analytical model, the authors run several regressions sector by sector to examine the regional variation in entrepreneurial activity, using data from the Labor Market Areas (LMAs) in America. They treat entrepreneurship as the dependent variable and calibrate it by new firm

² Acs ZJ, Armington C (2006) *Entrepreneurship, Geography, and American Economic Growth*. Cambridge University Press, New York, p. 60.

formation rates.³ The primary explanatory variables are educational attainment as a proxy for knowledge stocks, sector specialization as a proxy for knowledge spillover potential, and the share of proprietors and average establishment size as proxies for entrepreneurial culture. The empirical results are in accordance with the knowledge spillover theory of entrepreneurship. The authors specifically examine the role of human capital in entrepreneurial activity in the service sector.

While the authors realize the importance of sector specialization, their way to measure it (sector establishments per 1,000 population) cannot appropriately reflect “specialization.” Specialization only matters when comparison exists. To understand the degree to which one sector is specialized in a region, it either should be compared with another sector(s) within the same region, or with the same sector outside that region (for instance, the national average). Some scholars have studied entrepreneurship within some industries, such as clocks (Murphy 1966), popular music (Peterson 1971), automobiles (Clair 1980), and paper (Magee 1997), but these specific case studies shed no light on sector specialization because it does not compare these sectors with other sectors or a benchmark. This paper employs a better proxy of sector specialization and reexamines it as a determinant of entrepreneurship.

4.3 Methodology

Different from Acs and Armington’s work (2006), this study employs Metropolitan Statistical Areas (MSAs) as the basic unit of analysis. Although Acs and Armington (2006) have pointed out that some problems exist when MSA data are used, for instance, excluding some areas whose local economies are not centered on large cities, there are still persuasive reasons to do so. First, the growth of cities highly relies on adding new work or new knowledge to old work (Jacobs 1970; Lucas 1988), and creative activity nearly always occurs in cities (Florida 2002; Florida 2005). Second, most new businesses are formed in metropolitan areas⁴ and over 90 percent of all new technology intensive ventures are formed in

³ Some scholars, such as Shane and Venkataraman (2000) argue that entrepreneurship does not require, but can include the creation of new organizations. However, it is difficult to envision a world where entrepreneurial action does not leave a trail of new organizations.

⁴ The Census data show that nearly 70% single-unit births in 2003 occurred in MSAs.

metropolitan areas (Stough and Kulkarni 2001). Third, the data of MSAs has been recently updated, enabling this study to focusing on data after 2000.

The data sources include the U.S. Bureau of the Census (Census), the Bureau of Economic Analysis (BEA), and *2004 County and City Extra: Annual, Metro, City, and County Data book*. Metropolitan Statistical Areas are defined by the Office of Management and Budget (OMB) and has been changed several times as a response of regional demographic changes. This analysis is based on the definition of 2005. Original data using other definitions are converted to the 2005 definition through county level data. We run cross-sectional regressions with the data of more than 300 MSAs.

The dependent variable in this study is firm formation rate. This is a widely accepted measure in entrepreneurship research (Acs and Armington 2006). Although small business rate can also be considered as a reasonable proxy (Malecki 1994), it is not as good as firm formation rate in the sense that the latter can better reflect risk-taking-based entrepreneurial spirit. However, firm formation data at the MSA level are not directly available. As a second best choice, it is substituted by the number of single-unit births from the Census. The legitimacy using it lies in (1) single-unit births are all new firms; and (2) entrepreneurs seldom start businesses by opening multiple units. In this study, the dependent variable is the 2003 single-unit births normalized by the 2002 population in MSAs.⁵

The primary explanatory variables, as mentioned before, should be a proxy for sector specialization. Location quotients (LQs) are used in this analysis. Location quotient is a widely-used measure in regional economics, defined by the relative employment level in one industry in one region compared with that in a reference area such as the country to which the region belongs. It can be expressed as in equation (1).

$$Location \ Quotient = \frac{\frac{Regional \ Employment \ in \ Industry \ I \ in \ Year \ T}{Total \ Regional \ Employment \ in \ Year \ T}}{\frac{National \ Employment \ in \ Industry \ I \ in \ Year \ T}{Total \ National \ Employment \ in \ Year \ T}} \quad (1)$$

In this paper, location quotients for 8 of 20 two-digit NAICS industries are considered as one set of explanatory variables standing for sector specialization. These 8 industries are:

⁵ The 2003 county level data of single-unit births are the newest available by far. We converted it into the MSA level data using the definition of OMB.

- Construction
- Manufacturing
- Retail trade
- Information
- Finance and insurance
- Real estate, rental and leasing
- Arts, entertainment and recreation
- Government and government enterprises

These 8 sectors are selected due to their relative importance and data quality. Entrepreneurial opportunities can exist in all sectors but are expected to be more in industries embracing innovation and creativity. Among the list above, information sector has more potential for innovative opportunities and therefore the location quotient for information is hypothesized to positively affect entrepreneurship. Moreover, it is reasonable to hypothesize that the location quotient for government and government enterprises negatively affects entrepreneurial activity. Regions with a higher proportion of people working in the government sector means that the proportion employed in businesses will be less and *ceteris paribus* fewer people starts new businesses. Meanwhile, high employment in government always leads to bureaucracy and hierarchy, which may bring more interventions to the market and thus create barriers to new entries.

Besides these primary independent variables, it is necessary to control for some other variables that might contribute to regional variation in entrepreneurial activity. Following Acs and Armington's work (2006), population, population growth, income growth, unemployment rate, and establishment size all subject to control. Moreover, human capital has been shown to have significant impacts on entrepreneurial activity (Acs and Armington 2006) so it is also controlled.

Both population and population growth are expected to positively influence new establishments. Population size to some extent reflects agglomerations effect that might contribute to firm formation (Acs and Armington 2006). Large population also reflects high demands for varied products or services thus providing more entrepreneurial opportunities than small population areas. Moreover, talent immigration could be an important part of population growth. By accepting that talented immigrants

are more entrepreneurial than local residents on average, ⁶ population growth due to immigration will promote entrepreneurial activity. The log of population in 2002 and the average annual growth rate of population over the period 2000-2002 are used.⁷ The time lag between the dependent variable and independent variables enables us to test for causalities and thus to go beyond analyses based only on correlations.

Income growth could be a double-edged sword in terms of its role in entrepreneurship promotion. On the one hand, income growth may result from improved economic efficiency and macro economic development. In this sense, entrepreneurial activity is expected to be strengthened. On the other hand, high income can be linked to high wages. High wages tend to lower the incentive for employees to withdraw from their current jobs and then engage in starting new businesses. In this regard, entrepreneurial activity is expected to be weakened. Therefore, it is difficult to predict the impact of income growth on entrepreneurship. The average annual income growth rate over 2000-2002 is employed in this model. ⁸

The unemployment rate is another variable that may have an ambiguous effect. A high unemployment rate might be a signal of economic recession which is destructive to new business initiation. However, it also can be understood in the way that unemployed people who cannot get a job are opting for starting their own businesses to escape from poverty. But this type of firm formation probably has little to do with the Schumpeterian notion of entrepreneurship. The 2002 unemployment rate in this study is used. ⁹

Establishment size, as Acs and Armington (2006) have argued, represents the culturally driving force for entrepreneurship. Large average establishment size means frequent presence of large firms in the region. The presence of large firms generally gives rise to monopolistic or oligarchic market structure which deters new entries to the market. By contrast, a market dominated by small firms tends to be competitive and leaves promising room and opportunities for new entries which also tend to be small. Glaeser et al. (1992) have demonstrated the negative impact of establishment size on local market competition. Moreover, in terms of

⁶ This judgment stems from the empirical literature of human capital and entrepreneurship, in which human capital positively influences entrepreneurial activity (Lee, Florida and Acs, 2004; Acs and Armington, 2006).

⁷ Data source: BEA.

⁸ Data source: BEA.

⁹ Data source: *2004 County and City Extra: Annual, Metro, City, and County Data book*.

technological entrepreneurship, the potential of spillovers is low where large firms dominate an economy (Acs and Armington 2006). To sum up, establishment size is expected to negatively impact entrepreneurial activity. Establishment size is measured by the ratio of the 2002 employment to the 2002 establishments.¹⁰

Last but not least, human capital is expected to have a positive impact on entrepreneurship. Educational attainment is widely used as a proxy for human capital. It is considerably understandable that the high educational attainment of entrepreneurs is indispensable for almost all technology intensive entrepreneurship. The proportion of adults with a bachelor degree or higher education attainment in 2000 is used to measure the regional human capital level.¹¹

Having identified both dependent and independent variables, the widely-used Ordinary Least Squares (OLS) method is used to test the impact of sector specialization on entrepreneurial activity. The regression model is shown in equation (2).

$$En = \sum \alpha_i LQ_i + \beta \text{Logpop} + \chi \text{Popgrowth} + \delta \text{Incgrowth} + \phi \text{Unemrate} + \varphi \text{Estsize} + \gamma \text{Abcol} + \varepsilon \quad (2)$$

In equation (2), *En* means entrepreneurial activity normalized by population; LQ_i represents location quotients for 8 sectors listed in table 4.1; *Logpop*, *Popgrowth*, *Incgrowth*, *Unemrate*, *Estsize* and *Abcol* construct 6 control variables and in turn reflect population, population growth, income growth, unemployment rate, establishment size and human capital. The approach to the measurement of all the variables has been discussed above and is also summarized in table 1. Since we have 14 independent variables, besides a general OLS regression, the backward removal stepwise approach of regression¹² is employed to enable the elimination of insignificant predictors and also to deal with multicollinearity issues. Table 4.2 displays the correlation among the variables.

¹⁰ Data source: Census (establishment data) and BEA (employment data).

¹¹ Data source: Census.

¹² For a detailed introduction of the theory of stepwise regression, see Stough et al. (2006).

Table 4.1. Summary of Variables.

Variable	Variable Type	Obs.	Mean	Std.Dev.	Min	Max	Data Source
En=	Dependent	361	2.17	0.74	0.88	6.53	Census, BEA
LQcon=	Primary explanatory	339	1.03	0.24	0.39	1.93	BEA
LQman=	Primary explanatory	355	1.10	0.64	0.14	4.34	BEA
LQrett=	Primary explanatory	361	1.07	0.13	0.58	1.48	BEA
LQinf=	Primary explanatory	349	0.77	0.34	0.27	2.48	BEA
LQfni=	Primary explanatory	359	0.82	0.33	0.29	2.68	BEA
LQrearl=	Primary explanatory	359	0.89	0.31	0.33	2.43	BEA
LQarter=	Primary explanatory	344	0.92	0.43	0.19	3.48	BEA
LQgove=	Primary explanatory	361	1.14	0.50	0.42	4.42	BEA
Logpop=	Control	361	5.48	0.46	4.74	7.27	BEA
Popgrowth=	Control	361	1.01	0.01	0.98	1.06	BEA
Incgrowth=	Control	361	1.02	0.02	0.93	1.10	BEA
Unemrate=	Control	361	5.70	2.31	2.30	23.80	
Estsize=	Control	361	23.82	3.42	13.73	43.32	Census, BEA
Abcol=	Control	361	0.225	0.073	0.103	0.524	Census

Table 4.2. Correlation among variables.

En	LQcon	LQman	LQrett	LQinf	LQfini	LQreaerl	LQarter	LQgovge	Logpop	Popgrowth	Incgrowth	Unemrate			
1															
LQcon	0.5266	1													
LQman	-0.3954	-0.2267	1												
LQrett	0.1610	0.3697	-0.0418	1											
LQinf	0.3168	-0.0496	-0.2140	-0.1842	1										
LQfini	0.1885	0.0306	-0.1335	-0.0214	0.4425	1									
LQreaerl	0.7008	0.5567	-0.4547	0.1618	0.2294	0.1164	1								
LQarter	0.4938	0.2710	-0.2569	0.1244	0.2144	0.0773	0.5362	1							
LQgovge	-0.2309	-0.2839	-0.3534	-0.3164	-0.1407	-0.3361	-0.2153	-0.2479	1						
Logpop	0.1365	0.0198	-0.1330	-0.3349	0.4811	0.4417	0.3049	0.1426	-0.2400	1					
Popgrowth	0.5051	0.4947	-0.2820	0.0132	0.0408	0.1125	0.5101	0.1484	-0.1271	0.2332	1				
Incgrowth	-0.1113	-0.0782	-0.2181	0.0353	-0.2163	-0.1932	-0.1928	-0.0904	0.3424	-0.2638	-0.1431	1			
Unemrate	-0.2290	-0.0546	0.0148	-0.0212	-0.1852	-0.2516	-0.0496	-0.1608	-0.0411	0.0144	0.0962	0.1159	1		
Estsize	-0.5910	-0.5021	0.1580	-0.5883	-0.0932	-0.0533	-0.5220	-0.4388	0.5049	0.0585	-0.1273	0.1248	0.0638	1	
Abcol	0.3997	-0.1025	-0.2161	-0.3464	0.5334	0.2516	0.2411	0.2689	0.0752	0.2807	0.1004	-0.2192	-0.4526	0.0090	1

4.4 Results and Findings

4.4.1 Correlation Analysis

A preliminary result can be obtained from the correlation matrix. As table 2 demonstrates, both the location quotient for real estate, rental, and leasing and the location quotient for construction have a strong and positive correlation with entrepreneurial activity. It is in consistence with the rapidly-growing real estate market over the period of 2002-2003. The location quotient for arts, entertainment, and recreation appears to be another primary explanatory variable strongly and positively correlated with entrepreneurship. It makes sense in that a large proportion of employment in this industry can be considered as what Richard Florida calls “creative class” (2002) and creativity always contributes to entrepreneurial activity (Lee et al. 2004). It is not surprising that the location quotient for information has a modest and positive correlation with firm formation rate. Even only a couple of years after the burst of the internet bubble, the information industry still proves to be an important inhabitant of entrepreneurs. The location quotient for manufacturing is negatively correlated with entrepreneurial firm formation, supporting a declining importance of the U.S. manufacturing. Moreover, entrepreneurship and the location quotient for government and government enterprises present a negative correlation, which is consistent with our hypothesis.

As for control variables, population growth and human capital are strongly and positively correlated with entrepreneurial activity, just as we hypothesized. Establishment size and entrepreneurship show a strong negative correlation, highlighting the importance of entrepreneurial culture. Those two double-edged swords, income growth rate and unemployment rate, both show a negative correlation with firm formation rate.

Table 4.3. Regression results (observations 307).

Variables	Explanation of Variables	Adjusted R ² =0.7432 Coefficient (t-statistic)
LQcon	Location quotient for construction	0.297 (2.35) **
LQman	Location quotient for manufacturing	-0.036 (-0.67)
LQrett	Location quotient for retail trade	-0.618 (-2.61) ***
LQinf	Location quotient for information	0.233 (2.72) ***
LQfini	Location quotient for finance and insurance	0.087 (0.95)
LQreaerl	Location quotient for real estate, rental, and leasing	0.471 (4.03) ***
LQarter	Location quotient for arts, entertainment, and recreation	0.080 (1.29)
LQgovge	Location quotient for government and government enterprises	-0.082 (-1.06)
Logpop	The log of population	-0.207 (-3.14) ***
Popgrowth	Population growth rate	19.804 (7.85) ***
Incgrowth	Income growth rate	4.034 (2.82) ***
Unemrate	Unemployment rate	-0.032 (-2.44) **
Estsize	Establishment size	-0.094 (-8.76) ***
Abcol	Human capital	2.447 (5.24) ***
Cons	Constant	-19.216 (-6.36) ***

Significant at 5% level; *significant at 1% level.

4.4.2 Regression Analysis

While the general OLS regression and the stepwise regression models produce similar results, here we only present the result of the general OLS regression model (see table 4.3). In accordance with the correlation result, the location quotient for real estate, rental, and leasing and the location quotient for construction have the strongest positive impacts on entrepreneurship and both are significant. Considering the time period of this study, we would understand why these two industries greatly influence firm formation. while GDP increased by 5.16% from 2002 to 2003, the outputs of the real estate, rental, and leasing industry and the construction industry increased by 5.43% and 5.50% respectively, both higher than the aggregate growth rate.¹³ These two industries were obviously two driving forces of economic growth and therefore not surprisingly incubated more

¹³ Data Source: BEA.

new firms. This result somewhat favors the Kirznerian notion of entrepreneurship other than the Schumpeterian notion. It also implies that the entrepreneurial research should not be restrained within those high-technology industries, especially when entrepreneurship is defined in terms of new businesses.

The location quotient for information is another primary explanatory variable that significantly and positively affects new firm formation. It supports the knowledge spillover theory of entrepreneurship which argues entrepreneurs try to commercialize new knowledge by creating new firms, since the information industry appears to be a high-technology industry. The result implies that specializing in the information industry during 2002-2003 tends to produce vibrant entrepreneurial activity.

As for the remaining explanatory variables of interest, the coefficient of the location quotient for retail trade is significant, however, negative. It suggests that specializing in the retail trade industry tends to discourage entrepreneurship. The coefficients of the location quotient for finance and insurance and the location quotient for art, entertainment and recreation are positive, but insignificant. The former industry tends to be financially supportive of entrepreneurial activity, but “crowding-out” effects might also exist. In the financial industry barriers for new entries are relatively high, but this industry tends to be knowledge intensive. Accordingly, a large proportion of talent staying in financial sectors could prevent knowledge-based entrepreneurial activity. Therefore the insignificance of this coefficient makes sense. In addition, it is also consistent with the hypothesis that the location quotient for government and government enterprises has a negative impact on entrepreneurial activity. But its coefficient in the regression result is insignificant.

The location quotient for manufacturing in our result has a negative but insignificant effect on entrepreneurship. This insignificance is also understandable, since this sector can have whatever proportions of more (or less) entrepreneurial sub-industries from 0 to 1. Considering the Detroit-Warren-Livonia MSA as one example, its location quotient for manufacturing in 2002 is 1.43, which means its relative employment in manufacturing is 43 percent higher than the national level. While a large proportion of manufacturing employment is in the less entrepreneurial automobile manufacturing industry, its entrepreneurial activity is lower than the national level (1.99 vs 2.17 average single-unit births per 1,000 population). In contrast, San Jose-Sunnyvale-Santa Clara’ location quotient for manufacturing is as high as 1.93, indicating its relative employment in manufacturing is 93 percent higher than the national level, and even higher than that of Detroit. However, its entrepreneurial activity is higher than the national level (2.49 vs 2.17 average single-unit births per

1,000 population), thanks to its concentration in more entrepreneurial IT manufacturing industries.

Table 4.3 also shows that all the control variables are significant predictors of entrepreneurship. The coefficients of population growth and human capital are both positive, and the coefficient of establishment size is negative. These results are in consistency with Acs and Armingtons' (2006) work. The log of population has a negative impact on firm formation rate, which seems in opposition to our hypothesis. The negative effect however results from the way we normalize entrepreneurial activity, dividing single-unit births by population, and therefore does not necessarily downplay the agglomeration effect of population. As for the two double-edged swords, income growth rate exerts a positive effect on firm formation rate, indicating that the positive economic growth effect which encourages entrepreneurial activity outweighs the negative income growth effect which discourages entrepreneurial activity. Unemployment rate produces a negative effect on firm formation rate, which similarly highlights the positive economic growth effect. The signs of those two coefficients also imply active other than passive entrepreneurial activity.

4.5 Policy Discussion

4.5.1 Is a Government-Leading Sector Transition Necessary?

Having witnessed the successes of Silicon Valley, Austin Texas and Research Triangle Park in which entrepreneurial development have been important and contributing factors to economic development, some regional policy makers in the U.S. or even throughout the world consider developing their own high-technology sectors. This research, however, shows that such a government-leading sector transition may not be necessary for promoting entrepreneurship and further establishing an entrepreneurial economy.

Needless to say, the case of the Silicon Valley demonstrates that entrepreneurship in technology intensive sectors has produced powerful economic effects. The birth and development of some giant companies today such as Intel, Apple Computer, Yahoo!, and Google, may all be viewed as a result of entrepreneurial discovery and exploitation. However, the results of this research show that entrepreneurial activity in terms of firm formation is not restricted in high-technology sectors. Specializing in the information industry does have a significant and positive effect on

entrepreneurship; however, it is not as strong as specializing in construction or real estate, rental, and leasing, which are much less technology-based than the information industry. Therefore, to achieve growth via entrepreneurship, it might be better for local governments to simply support those sectors that have already created comparative advantages than initiate new sectors which face considerable uncertainty.

Nor is it necessary to subjectively give up a manufacturing base and switch to services. Many regions that have experienced impressive economic performance are more and more service-based. It therefore seems that further development may require a service base for the economy, *ceteris paribus*. According to this analysis, however, there is no evidence showing that entrepreneurial activity is more likely to occur in the service sector than in the manufacturing sector. By accepting the pivot role of entrepreneurship for growth, public policy should not aim at switching manufacturing to service but should aim at other effective ways to promote and support the entrepreneurial spirit.

The policy implications above are not rootless. Entrepreneurial profit is grounded on uncertainty (Knight 1964). With market complexity and asymmetric information, uncertainty pervades the market to some extent irrespective of sectors. Entrepreneurial activity therefore is expected to occur everywhere in the market. Even accepting knowledge-based industries are more entrepreneurial, as Michael Porter (1998) argues, “all industries can employ advanced technology; all industries can be knowledge intensive.” Therefore entrepreneurial opportunities extensively exist in all industries if entrepreneurs are willing to “employ sophisticated methods, use advanced technology, and offer unique products and services”¹⁴.

To sum up, even if sector specialization has an impact on entrepreneurship, the regression result provides little evidence to support our intuition that entrepreneurial activity is more likely to occur in high-technology industries. Therefore, a government-leading sector transition might not necessarily promote entrepreneurship and further induce economic development.

¹⁴ Porter ME (1998) Clusters and New Economics of Competition. Harvard Business Review 77, p. 80

4.5.2 What should Local Governments do to Promote Entrepreneurship?

By seeing the effects of the control variables in this study, population growth, income growth and human capital seem to have significant and positive influences on entrepreneurial activity; meanwhile, unemployment rate and establishment size significantly and negatively impact entrepreneurship. Based on these results, it is important for regional governments to consider several ways to promote entrepreneurship. First, attracting outside talent should be strategically emphasized in that it implies both population growth and human capital elevation. Second, public expenditures on education and professional or skill training should carry considerable importance to improve human capital and decrease the unemployment rate. Third, assistance or support to small businesses should be provided so as to lower the average establishment size within the region.

4.6 Conclusion

Entrepreneurship has been widely recognized as a significant contributor to regional economic growth. By accepting this presumption, to explore the determinants of entrepreneurship and the corresponding policy implications becomes centrally important. This paper examines whether sector specialization has effects on entrepreneurial activity at the regional level. Intuition probably tells people that entrepreneurial activity is more likely to occur in technology intensive regions or regions with more creative occupations. The empirical results in this paper, however, show some counterintuitive notions. Specializing in a knowledge-based industry does not necessarily lead to a higher level of entrepreneurial activity than specializing in other industries, in our case, the construction and real estate, rental, and leasing industries. The validity of this conclusion relies on two assumptions: (1) entrepreneurship can be defined in terms of firm formation, and (2) the way of measuring firm formation employed in this study is appropriate and accurate. By accepting these two assumptions, the results lead to a policy implication for local governments that the efforts to promote entrepreneurship by government-leading sector transitions might not be necessary. While all industries can be knowledge intensive, public policy should aim at building industrial capacity other than creating or choosing industries.

This research also sheds some light on where entrepreneurship policy should (more precisely, should not) go. Recently, there is an increasing concern over and interest with entrepreneurship policy (Lundström and Stevenson 2005; Acs and Armington 2006; Audrestsch et al. 2006; Kauffman Foundation 2007). As one of the earliest attempts, a book edited by David Hart (2003)—*the emergence of entrepreneurship policy*—almost entirely concentrates on the technology transfer policy. Our study implies that this might not be appropriate. Entrepreneurial activity occurs not only in the advanced technology sectors but in other sectors as well. Entrepreneurship policy, therefore, should not be towards any single sector, but towards individuals, firms or the society as a whole. This paper also suggests public efforts to change population, unemployment rate, human capital and entrepreneurial culture probably contribute to the promotion of entrepreneurship.

This study sheds little light on regional capacity building in the sense that the definition of entrepreneurship in terms of firm formation equalizes the importance of all the new firms. However, firm formation in high-technology sectors does contribute more than firm formation in routine sectors to the promotion of regional competitiveness. Therefore, entrepreneurship policy is critically determined by what exactly entrepreneurship should aim to do.

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5. Entrepreneurial Healthcare: A Study in State Policy Arbitrage

Scott Jackson

5.1 Introduction

Since the presidential election of 1992, health care and health insurance have been prominent in the public policy debate. Advocates for government intervention have repeatedly cast the current system as grossly inefficient in its inability to provide for the poorest individuals, a situation not dissimilar from every other major private good (e.g. housing), by pointing to the number of uninsured. However, many on the opposing side have noted that the actual proportion of the population without insurance has remain largely unchanged since the late 1980s and that since the population has increased this proportional stagnation is the result of immigrants, many illegal entrants into the country, are not covered by health insurance, come from countries with national health insurance systems and therefore are unaccustomed to having to purchase health insurance, and who place an ever increasing burden on the U.S. health care delivery system (2006). Those opposed to the effective socialization of the U.S. healthcare system have pointed out that recent improvements in Medicare have actually produced substantial savings for retirees through competition between providers and better patient education, but the long term sustainability of this approach remains in doubt (Ohsfeldt and Schneider 2006). This paper will explore one small aspect of the current healthcare debate: current state initiatives related to insurance and their impact on the entrepreneurial economy. The reader should bear in mind that building healthcare systems for an entrepreneurial economy appears to be the farthest thing from the minds of state governments and regulators; so, alignment between the typical motivation, budget considerations, and the entrepreneurial economy are serendipitous.

5.2 Health, Healthcare and Health Insurance

It is important to first establish what we mean by “healthcare”. Pundits and some scholars use the term healthcare and health as functional equivalents; however, they are quite different. One could argue that health is a pure public good while healthcare is a private good. Health has substantial externalities associated with it and there is no problem of diminishing returns with its consumption. It is both non-rival and non-excludable, but possesses characteristics sensitive to non-market failure: the impossibility of measuring output and nearly infinite externalities (Wolf 1997). Healthcare, however, is a pure private good, suffers from diminishing returns (Eberstadt and Satel 2004), is both rival and excludable, and the consumption of it does not necessarily translate into good health (Perry and Rosen 2004). As a result of the inherent measurement difficulties, entrenched interests and the problem of diffuse costs and concentrated benefits, public systems tend to equate healthcare provision with health status, and policy prescriptions center around the public provision of healthcare and financing (i.e. health insurance regulation or provision).

The current U.S. system is comprised of many variants including both private insurance and provision and public insurance (e.g. Medicare) and provision (e.g. The VA system). A major political debate underlying this discussion, however, centers around two critical beliefs. The first is philosophical about whether healthcare prices convey the necessary information to potential purchasers of health services to enable its efficient use, and second, whether as Ohsfeldt and Schneider (2006)¹ have put it “is profit-seeking inappropriate in health care?” One perspective on this affects the appetite for government intervention, and as James C. Robinson (2001)² would note, “the most pernicious doctrine in health services research, the greatest impediment to clear thought and successful action, is that health care is different.” It also affects whether healthcare is seen as a normal good or viewed as a human right and thus divorced from all considerations of economics. Tactically, if the government is to intervene in the healthcare market, should it employ an insurance model or provision model?

¹ Ohsfeldt, Robert L. and John E. Schneider. 2006. *The Business of Health*. Washington DC: AEI Press. September 2006. p. 33.

² Robinson, James C. 2001. *The End of Asymmetric Information*. *Journal of Health Politics, Policy and Law*. Vol. 26. No. 5. p.1045.

Several states, in an effort to resolve concerns with Medicaid and Medicare funding and political heat over the uninsured have adopted variants of both models in search of a solution. These models may have consequences for entrepreneurial activity, and when insurance is made mandatory the entrepreneur no longer has a choice about a potentially substantial portion of company resources. In the example, drawn from Morrisey's (2003) survey data, the annual cost of health insurance for firm of 19 employees is equivalent to 6 (individual) or 11 (family) weeks of paid vacation. Therefore, care should be taken when making such provisions mandatory as they may have highly regressive consequences (Damberg 1996).

Table 5.1 Estimated Gross Insurance Expenses.³

Policy	Avg. Premium	% of total compensation	Total Comp/mo (19 employees)	Ins. Prem./mo (19 employees)
Individual	402	10.4%	\$73,378	\$7,638
Family	732	17.5%	\$79,648	\$13,908

While it may be superfluous to equate the self employed or small firm with the entrepreneur, such an equation is our closest approximation for developing policy approaches for the entrepreneurial economy. A major tool in the transformation to an entrepreneurial economy is how we approach social policies such as healthcare. Will we primarily approach the challenges we face through the lens of the managed economy, driving toward group, one size fits all solutions or through an entrepreneurial economy approach favoring individual customizability and flexibility? It is the contention of the author that for the entrepreneurial economy the most appropriate option is to transform the health insurance system from one dominated by group plans and systems to one based on an individual insurance market. The straightest course of action in this regard is to employ health savings accounts.

5.3 How might Healthcare affect Entrepreneurship?

Studies of the impact of entrepreneurship on regional development have demonstrated that in the period of the 1990s, small and medium size enterprises and entrepreneurial firms were major drivers of economic growth (Audretsch and Thurik 1998). Audretsch and Keilbach (2004) have

³ Assumes \$20/hour wage and 173 hour work-month (Morrisey 2003, p. 3)

noted that entrepreneurial activity should positively impact economic activity as a mechanism for transmitting knowledge spillovers into economically value adding activities, by increasing overall competition and by providing variety among local firms thereby enhancing the local economic ecology. Highfield and Smiley (1987) found no significant relationship between new firm formation and microeconomic variables except for industry growth rate; however, this finding may suffer from ecology bias (Robinson 1950), a condition where results in the aggregate contradict what is known at the individual level. Since entrepreneurship is an individual decision, Audretsch (1995), and others, have recommended that the appropriate unit of analysis is the firm or individual, and therefore, individual considerations, such as the availability of affordable health insurance may affect the decision to become an entrepreneur. While equating small business policy with entrepreneurship policy is problematic, it is in some respects our closest approach to the problems facing entrepreneurs.

Shane (2003)⁴ notes that “entrepreneurial decision-making involves making non-optimizing decisions” where the reward or loss suffered by the entrepreneur, the “entrepreneurial profit” (Shane 2003)⁵, and the decision to exploit an entrepreneurial opportunity rely on the perception that the expected value of the opportunity exceeds the opportunity costs (Shane 2003). This occurs when an individual has lower opportunity costs, and one way to lower the opportunity cost is to affect health insurance costs either by directly reducing the insurance costs, reducing the cost of searching for re-insurance or eliminating the need to search for insurance altogether. The poison pill, however, is that the specific mechanism for reducing the opportunity costs could have negative effects.

Several mechanism individuals use to lower opportunity costs have been explored. For example, a link between an employed spouse and the pursuit of self employment (Blanchflower and Oswald 1998; Shane 2003), results in a subsidy of workers at small firms through coverage obtained from their spouses employer (Damberg 1996). The subsidy lowers the risk premium for self employment (Blanchflower and Oswald 1998); therefore, policy approaches which penalize spousal coverage could actually negatively impact entrepreneurial activity, penalizes workers at small firms (Damberg 1996) and subsidize higher income wage earners (Helms 2001). Studies by Monheit and Harvey (1993) and Gruber and Poterba (1994)

⁴ Shane, Scott. 2003. *A General Theory of Entrepreneurship*. Cheltenham: Edward Elgar. p. 39.

⁵ IBID. p. 45.

found that tax treatment affects the way health insurance is valued and that thereby lowering the effective price of health insurance to the self employed increases the likelihood that entrepreneurs will purchase health insurance. Perry and Rosen (2004) have counterfactual evidence in support of the health insurance as entrepreneurship subsidy hypothesis. They found that neither the health status of the entrepreneur or his children affect the decision to become self-employed. They also found no evidence to support the notion that healthier people become entrepreneurs, a finding which agrees with a large body of research in this area (Perry and Rosen 2004).

5.4 Other Considerations for Health Insurance and the Entrepreneur

One other possible affect, however, of health insurance in an entrepreneurial economy has less to do with the entrepreneur specifically and more so to do with his ability to attract and retain talent – health insurance as a strategic asset. A consideration affirmed by Morrisey (2003) who also found that benefits packages provided by very small firms were also somewhat more generous, smaller employee contributions or subsidized contributions, than at slightly larger firms which may be the result of the risk of working for a very small firm.

Table 5.2. Why Provide Insurance?⁶

Rationale for providing Health Insurance	Percentage
Aid in recruitment	67%
Reduce employee turnover	48%
Respond to employee demand	41%

When one considers that in 2001, roughly half the U.S. workforce was employed by firms smaller than 500 workers (57.4M vs. 57.7M by firms > 500 employees), such considerations are not trivial from the perspective of insurance provision or small business policy (source: SBA dynamic employment data 89-2002).

⁶ Morrisey, Michael A. 2003. NFIB National Small Business Poll: Health Insurance. Vol. 3. Issue 4. p. 2.

Table 5.3. Firm Size and Insurance Coverage.⁷

Small Businesses Providing Health Insurance	Percentage
10 or fewer employees	41%
20 – 249 employees	78%
Average	48%

Lastly, what is also true is that what may be beneficial or detrimental to small employers may be neutral or positive for slightly larger employers. While mandatory insurance coverage may be very negative for small and entrepreneurial firms due to its impact on startup costs, it may be beneficial to slightly larger, fast growing or gazelle firms by removing from the competitive equation health insurance as a tool for attracting talent.

5.5 Health Costs/Insurance and the Entrepreneur

It is important to keep in mind that two basic questions are involved in the discussion of health insurance. The first is related to health status and linked to the debate over universal access and employee benefits, and the other, which this paper is concerned with is whether the availability of health insurance affects the propensity to become an entrepreneur. The link between health insurance and health status of the entrepreneur is at best inconclusive (Perry and Rosen 2004), and in an entrepreneurial economy, public policy may (1) impede entrepreneurial activity, (2) be ambivalent to entrepreneurial activity or (3) facilitate entrepreneurial activity.

While a recent article in the New York times suggests that the escalating costs of health insurance is side-lining would-be entrepreneurs, especially those with pre-existing conditions (Tahmincioglu 2006), a 2003 study conducted by the National Federation of Independent Business of firms smaller than 250 employees found that 91% of small business owners had health insurance for themselves; obtaining it either through their business, as individual coverage or from a spouses employer. Only 2.5% of these uninsured owners were uninsured from longer than 12 months, suggesting that a chronic lack of insurance is not an issue among those who choose to start or operate small businesses (Morrisey 2003).

⁷ IBID, p. 1.

Table 5.4. Small Business Owner Health Insurance Coverage.⁸

Source of Insurance Coverage	Percentage
Through small business	37%
Bought non-group coverage insurance	23%
Coverage through spouses employer	31%
Did not have health insurance	9%

While it is clear from repeated commentary in the press that the high cost of health insurance is something small business owners complain about, it is unclear whether in fact it actually deters individuals from pursuing self-employment which might lead one to conclude that the noise level is simply being used or generated by those intent on some sort of national approach to health care and health insurance.

5.6 Methodology (Analysis Framework): Healthcare in an Entrepreneurial Economy

So what is an entrepreneurial economy and what characteristics might healthcare have in this type of economy that it does not possess in other types of economies? As Baumol, Litan and Schramm (2006) point out, in an entrepreneurial economy it must be easy to form a new business and close a failing one, institutions must reward entrepreneurial activity that create value in the economy by turning economically useful knowledge into products and services instead of simply carving up the pie into every diminishing slices, society must invest in knowledge generation and exploitation of new knowledge, and institutions should ensure that both entrepreneurs and larger, older firms have incentives for continued innovation. Health systems can complicate the process for forming and closing businesses depending on how the system is financed and how that financing is affected by the joining and separation of employees.

Health systems which are largely employer based have difficulty with the loss of coverage during periods of unemployment. National government which rely on these systems are tempted to make it difficult to separate workers through elaborate severance packages and procedures, which have the unintended affect of reducing the hiring demand and thus increasing unemployment, and from an entrepreneurial perspective can make firm closure cumbersome and difficult. State sponsored systems have portability and short term costs advantages via monopsony power,

⁸ IBID, p. 2.

but create powerful disincentives to innovate (Bate 2003) by disrupting the value-price relationship, particularly for rare and debilitating diseases, requiring additional intervention such as orphan drug regulations and subsidies to resolve.

In the entrepreneurial economy, flexibility and cost is the name of the game. Four conditions are necessary with regard to health care and health insurance and these four conditions will be used as the primary evaluation tool in the remainder of this analysis: (1) access to care, (2) portability of insurance/healthcare financing, (3) cost of healthcare financing relative to other inputs and (4) the flexibility of the coverage. The remainder of the analysis will employ these for criteria in evaluating the various state initiatives currently underway for Medicaid, Medicare, the uninsured and an individual insurance market via health savings accounts, but will not consider the public provision of health care services.

5.7 Defining Terms of the Framework

Access to care in this context is not a question of cost benefit but of the actual availability of specific types of treatments or transit for services. Entrepreneurs are not necessarily more healthy than the general wage labor population (Perry and Rosen 2004), and most workers are healthy (Moon, Nichols, and Wall 1996); therefore, the majority of health services demanded by both entrepreneurs and their employees would be general, outpatient services (e.g. minor emergency care). The availability of general outpatient services within a given community with flexible hours would be a critical component of access. This is supported by the results of a 1994 Harris poll for the Commonwealth Fund which found that two-thirds of respondents cited ease of scheduling an appointment (e.g. hours/availability), office location and physician reputation as most important in their selection of physicians (Klick and Satel 2006). Thus in an entrepreneurial economy the availability of services will continue to be important for economic growth and especially so in small, rural and inner-city communities where service disparities already exist (Klick and Satel 2006)⁹.

The second condition is the portability of insurance/healthcare financing. Several attempts have been made to remedy the coverage gap resulting from loss of employment (Herrick 2006). This included the creation

⁹ Klick, Jonathan and Sally Satel, M.D. 2006. *The Health Disparities Myth*. Washington DC: AEI Press. January 2006. p. 29.

of COBRAs in 1986 which extended group insurance rates to individuals, but COBRAs have largely failed to bridge this gap in part due to the relative generosity of the packages (Zuckerman, Haley, and Fragale 2001), their resulting costs and the possibility that these rates may be suboptimal at the individual level. Under such circumstances, an employee who had a significant health condition would have an incentive to pay for the more generous coverage whereas individuals with generally good health would opt for a lower cost, less comprehensive regime – the classic adverse selection problem. The current insurance system is group and employer based which suffers from agency problems and issues (Cutler and Zeckhauser 1999) and heavily weighted employer subsidies (Helms 2001). An alternative to this system would be to transition the system to one based on either public provision of health insurance or transition to an individual insurance market. Initiatives designed to provide the same sort of tax treatment to individual and small group insurance, such as HSAs and MSAs, and thus remove the employer sponsored bias in health insurance are a move in this direction, this is diametrically opposed in some respects to other initiatives designed to remove inequalities in the system by eliminating fragmentation in the health insurance market (Moon, Nichols, and Wall 1996) and essentially remove any negative subsidy for poor health maintenance choices.

The third condition necessary for an entrepreneurial economy is the relative cost of health care financing versus other inputs. As noted earlier, according to Morrisey's (2003) survey of small business owners, insurance premiums comprise 11-18% of compensation (12-20% of wages) assuming compensation is only wages and health insurance or roughly 3-5 times the cost of customary paid vacation. Policies which have the affect of reducing the cost of insurance to the entrepreneur might be considered appropriate for an entrepreneurial economy; however, since entrepreneurial firms tend to be cash constrained, policies specifically related to tax incentives for the firm either credits or subsidies would be less effective due to smaller relative tax liabilities. Policies that put downward pressure on insurance costs, such as expanded risk pooling, or shifting the burden of insurance from the firm, either to the individuals or the public sector, are more helpful. Thus plans aimed at reducing the costs by removing differential tax treatment for individual versus employer provided plans and for risk pooling, to the extent this actually reduces cost, could have a positive impact on the cost of coverage. One caveat here, however, regarding shifting the burden to individuals is the problem of adverse selection: low risk individuals exiting the risk pool (Herrick 2006; Moon, Nichols, and Wall 1996; Ohsfeldt and Schneider 2006). Shifting the insurance burden to individuals may cause a rise in price level and supply

discrimination with adverse social consequences. Initiatives aimed at requiring individual or group insurance may in fact make insurance more costly by removing competition between insurance providers for these low cost individuals.

The fourth, and final, criteria for health care financing in an entrepreneurial economy is the flexibility and customizability of the coverage. An individually oriented health insurance system is inherently more customizable than are large, employer or state sponsored health insurance plans which rely on economies of scale, product standardization and risk sharing to lower costs. A health insurance system where coverage can be tailored to the needs of individuals, who may select different coverage or benefits in exchange for larger medical co-payments or a reduction in services, is by definition more flexible and that flexibility is critical in maintaining the political sustainability of any health care financing system over the long term. One important problem; however, is that in the optimal economy, a mix between big firm and entrepreneurial economies (Baumol, Litan, and Schramm 2006), an individually oriented insurance system may not be able to coexist with large group insurance plans as they are currently constructed (Moon, Nichols, and Wall 1996).

5.8 Data and Information Base

The analysis will focus on initiatives currently being explored by various states and health savings accounts. Data for the analysis is drawn from the State Policy Network's Medicaid Exchange (issues 17 and 19)^{10,11} and ballot initiatives related to health from the database of the National Conference of State Legislatures (www.ncsl.org)¹². Ballot initiatives run the gamut from cigarette taxes funding health initiatives to the expansion of scope for the Oregon Prescription Drug Program essentially allowing any resident to use the states bargaining leverage to extract price discounts from drug manufacturers – a procedure now fully employed in Maine, and

¹⁰ State Policy Network. 2006b. SPN Medicaid Exchange. Issue 17. http://www.spn.org/publications/pubid.139/pub_detail.asp. Richmond, CA: State Policy Network. Published on Wednesday, September 06, 2006.

¹¹ State Policy Network. 2006. SPN Medicaid Exchange. Issue 19. http://www.spn.org/publications/pubid.145/pub_detail.asp. Richmond, CA: State Policy Network. Published on Thursday, October 26, 2006.

¹² National Conference of State Legislatures. Nov 8 2006. Recently Approved 1115 waivers. <http://www.ncsl.org/programs/health/1115waivers.htm>.

includes a ballot initiative in Missouri control stem cell research and therapies at the state level, prohibiting local bans on research or therapies (NCSL database, www.ncsl.org). Data on health savings accounts was provided by J.P. Morgan Case in their 2006 Individual Participant HSA enrollment package and HDHP/HSA¹³ and individual insurance rates from individual quotations for Virginia provided by UniCare® Life & Health Insurance CompanyTM.^{14,15,16}

5.9 Analysis: Survey of Cases

5.9.1 Health Savings Accounts and Medical Savings Accounts

Acs and Schramm (2006) have proposed addressing the needs of an entrepreneurial economy by making Health Savings Accounts (HSAs) available to individuals without employer sponsorship and by allowing small businesses to cooperate in forming insurance risk pools in order to reduce the cost of insurance for small employers and their employees with pre-existing conditions.

Health Savings Accounts are medical savings accounts designed to shelter income in a pre-tax environment to be used on qualified medical expenses. They were established as part of the Medicare Prescription Drug, Improvements, and Modernization Act of 2003, and are administered under IRS code section 223. In order to be qualified an individual must have coverage under a qualified high deductible health insurance plan (HDHP) having a minimum annual deductible of at least \$1,050 single/\$2,100 family. The HDHP must be your only type of insurance

¹³ Chase, J.P. Morgan. 2004. Chase Health Savings Account (HSA): 2006 Individual Participant HSA Enrollment Package. No. 10551 11/05. pp. 15.

¹⁴ UniCare Life & Health Insurance Company. 2006. Virginia Individual and Family Health, Dental and Life Insurance Plans. No. 10738VA 10/05. UniCare Life & Health Insurance Company, Sales Office, Bolingbrook, IL.

¹⁵ UniCare Life & Health Insurance Company. 2006. Virginia Individual and Family Health, Dental and Life Insurance Plans. No. 0010124VA 10/05. UniCare Life & Health Insurance Company, Sales Office, Bolingbrook, IL.

¹⁶ UniCare Life & Health Insurance Company. 2006. Virginia Individual and Family Monthly Rates Effective January 1, 2006. No. 10732VA 10/05. UniCare Life & Health Insurance Company, Sales Office, Bolingbrook, IL.

except for specific disease plans (e.g. dental insurance). The individual/family cannot be enrolled in either Medicare Part A or B; may not be a dependent on another person's tax return, and must be a U.S. citizen or resident alien. Contributions to HSA accounts are not subject to income taxes and cannot be made unless the individual has an HDHP. Funds are disbursed from the HSA at the discretion of the individual and if used for qualified medical expenses are tax exempt; however, if disbursements are not used for qualified expenses, they are treated as regular income on the individual's taxes and an additional 10% tax is also applied. In 2006, the maximum annual contribution was \$2,700 for an individual and \$5,450 for a family (Morgan-Chase 2004).

Earlier incarnations of medical savings accounts and flexible spending accounts were not generally embraced by employees at larger firms as roughly 16 percent of workers in large firms took advantage of flexible spending accounts (Foster-Higgins 1994; Moon, Nichols, and Wall 1996). Advocates of HSAs have argued that individual insurance plans should receive tax treatment comparable to that for current employer provided plans. Since employer provided plans receive full deductibility, individual plans should be treated similarly. While this seems in conflict with those who argue for reducing the distortions caused by deductibility or the revenue impacts, it may in part be the result of a conviction that repealing tax deductibility for employer provided insurance may be politically unrealistic due to the popularity of the deduction and the various interests (e.g. insurance providers) allied to it (Moon, Nichols, and Wall 1996). Those who argue against HSAs do so generally on equity grounds and concerns that individuals in need of care will be denied that care due to pre-existing conditions, that preferential tax treatment may continue to insulate individuals from the cost of their choices, and further exacerbate fragmentation in the health insurance market. They may also oppose HSAs out of concerns that HSAs will drive out other types of plans, and cause a disproportionate burden on low and moderate income individuals resulting from the high deductibles (Moon, Nichols, and Wall 1996)¹⁷. The following table illustrates the cost impact of HSA and HDHP plans to the individual insured: the figures are drawn to an adult male, in good health between 40-44 years of age.

¹⁷ Moon, Marilyn; Len M Nichols and Susan Wall. 1996. Medical Savings Accounts: A Policy Analysis. Washington DC: Health Policy Center of the Urban Institute. p. 14.

Table 5.5. Sample Rates Traditional PPO/HMO and HAS/HDHP.

Plan	Deductible	Out of Pocket	Co pays	Coverage (%:%)	Drugs	Premium
Traditional	\$2,000	\$3,000	\$30	70:30	100%	\$113
Variable Deductible	\$1,000	\$5,000	Variable	80:20	100%	\$113
HDHP 2	\$2,650	\$5,000	Variable	80:20	100%	\$80
HDHP 3	\$5,000	\$5,000	Variable	100%	100%	\$74
Variable Contribution	\$2,650	\$5,000	\$0	100%	100%	\$89

Under their current structure, HSAs ensure a market for high deductible health plans, and thus are more in line with the interests of insurers rather than those of the insured. While HSAs are somewhat less expensive than comparable insurance (~25% in this example) the requirement for an HDHP means that the individual is not free to choose the optimum insurance arrangements for their specific needs. Their cost profile would make them more attractive to lower risk individuals or individuals who incorrectly perceive their risk as lower. Once the HSA is fully funded, they might be attractive for individuals who are particularly difficult to insure in an individual market due to pre-existing or chronic illness. While HSAs are dramatically more flexible than group plans, this linkage feature, makes it more difficult for these accounts to compete in the insurance market and puts the power more in the hands of the insurance companies than in those of the insured. Lastly, the annual contribution caps are low relative to the deductible and out-of-pocket expense risk. In a given year, these expenses could easily exceed annual contribution caps, and thus, pose a substantial risk to the individual during their first few years in the plans. In light of this, when HSAs are tied to HDHPs, annual contributions should be capped at no less than the maximum cost of deductible and out-of-pocket expense combined.

HSAs/HDHPs do nothing to affect the access to care requirement of an entrepreneurial economy as they do not provide for greater availability of treatment options within a specific geography.

Since HSAs philosophically shift the insurance market to individuals, they should promote both portability and flexibility; however, while these accounts offer a mechanism for increasing consumer choice, at present they travel most with the insurer and not necessarily the insured. The HSA/HDHP linkage functions to suppress demand for these types of plans regardless of their individual needs. As a result, some charge that this makes the plans practically useless for low income individuals (Moon, Nichols, and Wall 1996) and may be similarly problematic for entrepreneurs as well.

Where states have invoked mandatory insurance requirements HSAs may offer a lower cost option though the state mandate may actually drive up the cost of these types of plans by increasing demand. Mandatory insurance requirements coupled with HSAs may have negative effects on employer provided plans by creating an incentive structure that encourages employers to abandon more generous plans for the state mandated minimum (Moon, Nichols, and Wall 1996). They may however broaden the insurance market by encouraging greater participation by the young and healthy (Herrick 2006). Damberg (1996) points out that individual versus employer insurance mandates provide a superior ability to target subsidies to low income families, this targeting would result in overall lower total subsidies paid out and reduce distortions but likely result in coercive marginal tax rates.

Finally, HSAs promise the possibility of cost reductions to employers through lower premium rates and to the aggregate health care cost picture by allowing price discrimination in medical services. This may reduce monopoly profits for hospitals, which are usually public or quasi-public monopolies, and place price pressure on physician and nursing salaries. Because this price discrimination occurs at the individual level, there is a greater potential for the most effective treatment for the greatest number of individuals to emerge as a successful product instead of being forced on a patient population in somewhat non-optimal circumstances through rationing and formulary access controls though some steps will need to be taken to mitigate moral hazards in mandatory insurance markets.

5.9.2 State initiatives

Because Medicare/Medicaid budgets are administered by the states, cost control is the primary motivator for these initiatives. “Despite the slowed growth, state Medicaid officials indicate that growing health care costs and the erosion of employer-sponsored health coverage are two reasons that overall pressure to constrain Medicaid spending has not subsided,” and “while cost control remains a priority, state Medicaid officials appear to have moved away from a primary focus on cost containment to a range of priorities including expansions or restorations of eligibility and benefits, improving quality, and changing the delivery of long-term care services.” (Senior-Journal.com 2006) Numerous attempts at Medicaid reform are highlighted in the State Policy Network’s SPN Medicaid Exchange¹⁸ and

¹⁸ State Policy Network’s SPN Medicaid Exchange volumes 17 and 19.

these programs are highlighted in table 5.6 with their expected impact in the entrepreneurial economy.

Several states have adopted initiatives that attempt to use patient choice and incentive structures to encourage healthy behavior (e.g. disease mgmt programs) and enhance cost control among Medicaid recipients (Vock 2006). Idaho has also considered dividing patients into three groups: healthy adults and children, disabled individuals and the elderly. Prompting concern from disable Medicaid recipients (Boyd 2006). Texas is considering giving the private sector incentives to offer employees long term health insurance and paying employees' nursing home premiums (Editorial 2006). Tennessee is considering a greater reliance on in-home care, and currently will seize assets to recover costs of care under Medicaid through a vehicle called "Miller Trust" (Buttorff 2006). Wisconsin's SeniorCare program has directly negotiated drug prices and rebates with drug companies (Wahlberg 2006), and Arkansas and Oregon have employed old fashioned formulary control in the guise of "Evidence-Based Prescription Drug Program" (Moritz 2006). Indiana currently has Medicaid recipients enroll in a managed care plan (AP 2006). In addition, several states have employed programs involving public private insurance partnerships, mandatory insurance and public HMOs.

Table 5.6. Summary Table of State Health Initiatives and Features for an Entrepreneurial Economy.

State	Description	access	portability	cost	flexibility
Arkansas/Oregon	Formulary Control. Evidence-Based Prescription Drug Program which provides a state sponsored review of safety and efficacy literature on specific drugs and conditions, reducing the number of available drug therapies to four.	(-)	(+)	(+)	(-)
Oregon	Considering expansion of Medicaid prescription drug program to the general population.	(-)	(+)	(+)	(-)
Multiple	Patient choice in Medicare/disease management programs.	(-)	(+)	(+)	(+)
Tennessee	In-home care for Medicaid patients.	(+)	(+)	(+)	(+)
Arkansas	Enabled employers with fewer than 500 employees to buy-in to Medicaid coverage for their workers.	(-)	(-)	(+)	(-)
New Mexico	Adopted a public private partnership to provide low cost insurance to small businesses for low income workers.	(-)	(-)	(+)	(-)
Oklahoma	Employer-Employee Partnership for Insurance Coverage (O-EPIC) for employers w/<25 workers, it includes companies that currently offer health insurance and workers and spouses are eligible if income <185% fed. poverty level.	(-)	(-)	(+)	(-)
Massachusetts	Massachusetts health reform law has employer insurance mandates and has described as a pay-to-play system (Goodman 2006).	(-)	(+)	(-)	(+)
Vermont	Vermont is teetering on the state provision of healthcare and is set to employ a state provided insurance product called Catamount Health and a state HMO for Medicaid (McCloughry 2005; Ethan Allen Institute 2006; NCSL 2006).	(-)	(+)	(?)	(-)
California	California's single payer healthcare system (S.B. 840) was not signed into law by the governor (Jones 2006) possibly due to concern over the impact on the CA health insurance industry and probable job losses.	(-)	(+)	(?)	(-)
HSA/MSAs	HSAs/MSAs coupled with High Deductible insurance programs.	(-)	(+)	(+)	(+)

5.9.3 Summary

Most of the approaches presented above are essentially insurance approaches and thus by this definition of access simply have no affect on the availability of treatment options. Few states appear to be considering approaches to the structure of healthcare delivery that might improve this situation such as reducing the number of full service hospitals in a specific geographical region or improving the climate for outpatient and minor emergency care facilities, or from a greater involvement of nurse practitioners, physician assistants and pharmacists.

Coverage portability and specifically the portability of the entrepreneur's coverage, another criteria for an entrepreneurial economy, is being addressed tangentially by state, public-private partnerships such as those in Arkansas, New Mexico and Oklahoma and full state provision of healthcare or health insurance, and would also be address more effectively by an individually oriented health insurance market which is only dealt with effectively by Health Savings Account/High-Deductible Health Plan insurance coverage.

As noted, most of the initiates are concerned with cost control and specifically for the state's costs, by attempting to reduce the risk in the Medicaid risk pool. While this may have positive benefits for Medicaid recipients it is likely to result in insurance premiums greater than those which a small private employer can negotiate on their own as their employees would be at a relatively lower risk than Medicare and Medicaid recipients for adverse health conditions. Public-private partnerships and state provision or insurance systems also promise the possibility of achieving significant cost control through monopsony power but placing the burden for fiscal restraint on individual healthcare providers (i.e. supply side) and effectively create a disincentive for innovation on the demand side. These approaches trade short term gains in cost control for long term benefits from investments in research and development. They show no promise of affecting costs through consumer choice and more individually focused market-power which have their strongest components in the HSAs/HDHPs individual insurance market. Collective buying systems also make it much harder for smaller more innovative medical services organizations to compete in what is in essence an economies-of-scale/standardization environment punishing innovation and crippling consumer choice. Of course these systems also dramatically limit the flexibility of coverage and reduce the choices of coverage and services available to patients. A small cadre of states has pursued more individual choice via flexible plans, but these still constrain individual choice by limiting selection of options or reducing flexibility. Focusing on the individual

insurance market is one of the few transformational changes being discussed in health policy circles, specifically related to HSAs, but there is concern in some circles that such accounts and traditional coverage can not be sustained within the same benefits package (Moon, Nichols, and Wall 1996).

5.10 Conclusion

While installing state or national plans is politically tempting, given the nature of an entrepreneurial economy and entrepreneurs to arbitrage between factor input conditions, installing a national system actually could work against an entrepreneurial economy as well as reduce innovation in the sectors most necessary to obtain more cost effective care as the country's population continues to age: pharmaceuticals, devices, care delivery services and insurance. How we approach healthcare funding could have dire long term consequences for our ability to engage in cost control as the population ages and when considering the dominance of the U.S. pharmaceutical industry in terms of bringing new therapies to market this could have dramatic consequences not only for the aging U.S. population but globally.

While it may be superfluous to equate the self employed or the small firm with the entrepreneur in all but the shortest timeframe as it is likely to overstate the number of entrepreneurs and argue for policies which do not in any material sense affect entrepreneurial activity, such an equation is our closest approach to developing policies suitable for an entrepreneurial economy. A major tool in the transformation to an Entrepreneurial Economy is a transformation to individual insurance system via the use of health savings accounts. These policies offer the possibility of transforming the insurance market to one more sensitive to individual choice are more likely to facilitate and less likely to conflict on a more macro level with the requirements of an entrepreneurial economy. In an entrepreneurial economy, flexibility and cost is the name of the game, and the conditions necessary with regard to health care and health insurance for this economy are improved access to care, portability of insurance/ healthcare financing, cost of healthcare financing relative to other inputs and the flexibility of the coverage. HSAs offer a surprising promise in facilitating this transformation if they are decoupled from the requirement for high deductible health insurance and if individual insurance products face the same tax treatment as employer provided insurance products. This last element can be achieved by either dismantling the preferential treatment

for group plans or extending that coverage to individual plans (Moon, Nichols, and Wall 1996).

Shane (2003) notes entrepreneurs tend to see opportunities versus risks and thus have a sort of risk blindness. In this situation, the risk of being uninsured may be underestimated even more so than in the general population and would therefore be observed in the entrepreneurial community as lower proportions of individual entrepreneurs being insured. Morrisey (2003) found that only 9% of small business owners are without insurance coverage and 6.5% are uninsured for relatively short periods of time. This supports the risk blind contention of Shane (2003). While considerable noise about health insurance impacting the entrepreneurial decision exists (Tahmincioglu 2006), evidence is lacking. This actual impact of insurance products on entrepreneurial activity is an area for future research and the mandatory health insurance environment of Massachusetts health reform law provides a natural laboratory.

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6. Evaluating University Technology Transfer Offices

Kirsten Sachwitz Apple

6.1 Introduction

Technology transfer offices were established at most university with the mission of supporting and helping professors, students and administration to develop and commercialize their inventions. This normally took place in the form of one centralized technology transfers office taking the technology concepts through disclosures and applying for patents, which were typically licensed to large fortune 500 corporations. Much research has shown that the growth of America today and the continued growth of America tomorrow will be through entrepreneurial efforts (Schramm 2006). With this new perspective it is important to ascertain whether this model for technology transfer is sustainable into the future.

Three main shifts in the economy are posited and tested using historically based case study and time series data to ascertain whether university technology transfer offices have made the leap to the entrepreneurial economy. The results of the analysis are used to suggest a more appropriate structure for this new structural feature in the economy.

6.2 Historical Review

6.2.1 History of University Technology Transfer Offices

University Technology Transfer Offices (TTO) have been around for nearly a century. The first know TTO is considered Wisconsin Alumni Research Foundation (WARF) started in 1925 (Blakely 2002). Today that

program delivers more than 100 license agreements on University of Wisconsin technologies each year. Other large universities such as Indiana University have followed a similar TTO model establishing Indiana University Foundation for technology transfer in 1936 (Jackson 2004). Many well know leaders in technological development and strong engineering focus, such as Stanford and MIT, did not establish TTOs until much later.

As a result of the enactment of the Bayh-Dole Act in 1980, TTOs were rapidly established at many universities across the country as illustrated in figure 6.1 (Audretsch 2006). The Bayh-Dole Act was established in 1980 and it is clear in Figure 6.1 that TTO began to grow around this time. This was a steady increase; it took many years for some universities to establish official TTOs because of significant changes such as amendments to university charters as well as Board of Visitors/Directors and budget approval were required.

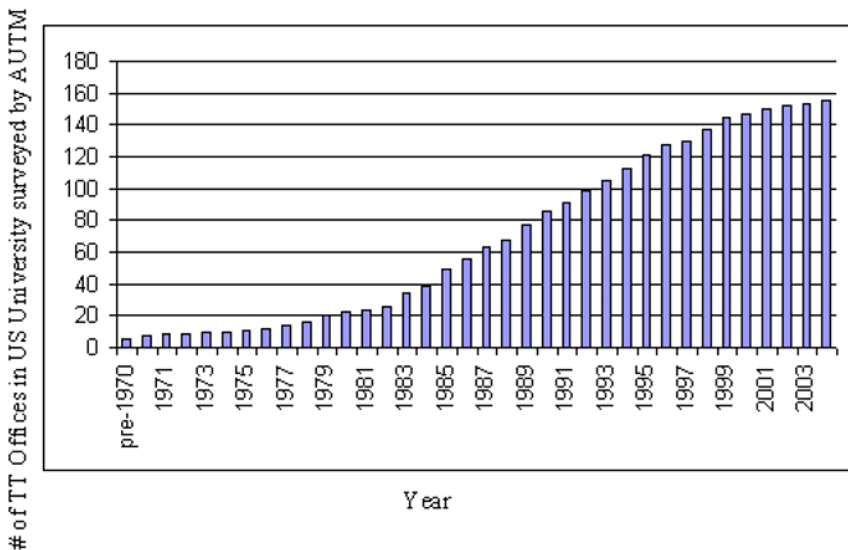


Fig. 6.1. Growth of TT Offices in U.S. Universities (source: Association of University Technology Managers (AUTM) 2004).

6.2.2 University Technology Development Model

While not all universities have the same structure there is a general model that all universities follow. This development model starts with research and development as the first step in the knowledge development process.

The more promising inventions are they typically patented. Most universities have TTO responsible for university patenting process. Universities without TTOs tend to utilize alternate administrative structures such as a dean or provost to work with outside legal council to patent innovations or the university has a policy which requires patenting costs to be covered by the inventor. After a university is granted a patent (or a pending patent) it is in a position to capitalize on their created knowledge, and this is traditionally done in two ways. They can license the patent to an established corporation and allow them to develop the innovation or create a spin-off to allow a new firm to exploit the invention.

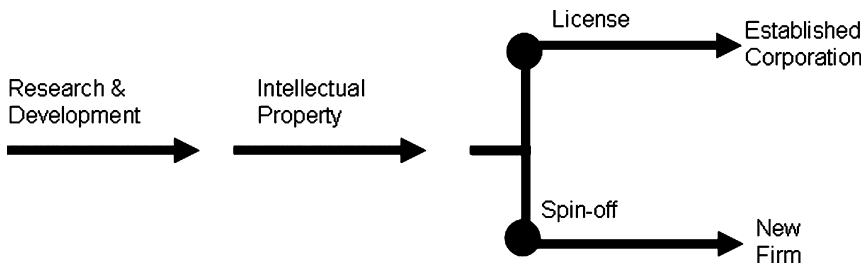


Fig. 6.2. Traditional University Technology Development Model.

6.2.3 History of the Bayh-Dole Act

The Bayh-Dole Act was a milestone for universities because it enabled small business and non-profits including universities to retain intellectual property rights and ownership from federally funded research programs. The legislation was passed in 1980, after the key champions of the legislation, Senators Birch Bayh of Indiana and Robert Dole of Kansas.

Many believe the Bayh-Dole Act was going to save American. David Audretsch research went so far as to say: “Assessment about the impact of the Bayh-Dole Act on penetrating the knowledge filer and facilitating the commercialization of university research have been bordered on euphoric” (Audretsch 2006, p5) referencing the economist article that continued to praise the Bayh-Dole Act as “possibly the most inspired piece of legislation to be enacted in American over the past half-century” (The Economists, 2002).

Others have been more skeptical such as Mowery who argues the positive assessment of the Bayh-Dole Act is exaggerated and the Bayh-Dole Act as a catalyst is somewhat misplaced (Mowery 2004).

The question remains whose assessment of the Bayh-Dole Act is correct? The answer is both, it just depends what you are using to measure success. As will be discussed in more detail in the analysis section, universities have produced more patents since the Bayh-Dole Act but have not had as much success in developing these inventions into marketable products through licenses or spin-offs.

6.2.4 Growth in R&D

There is agreement in the economics literature that R&D is an input into new knowledge, innovation and entrepreneurship. Some would go so far as to say it is the greatest source generating new economic knowledge (Cohen 1987).

Total R&D conducted by universities has been steadily increasing since the 1980s. In 1980 US universities had around three billion dollars in R&D investment this has increased almost seven fold to over twenty billion in 2004 (2006). R&D has also increased significantly in industry perhaps through federal research funding and moderately in the federal research funding as can be seen in Figure 6.3.

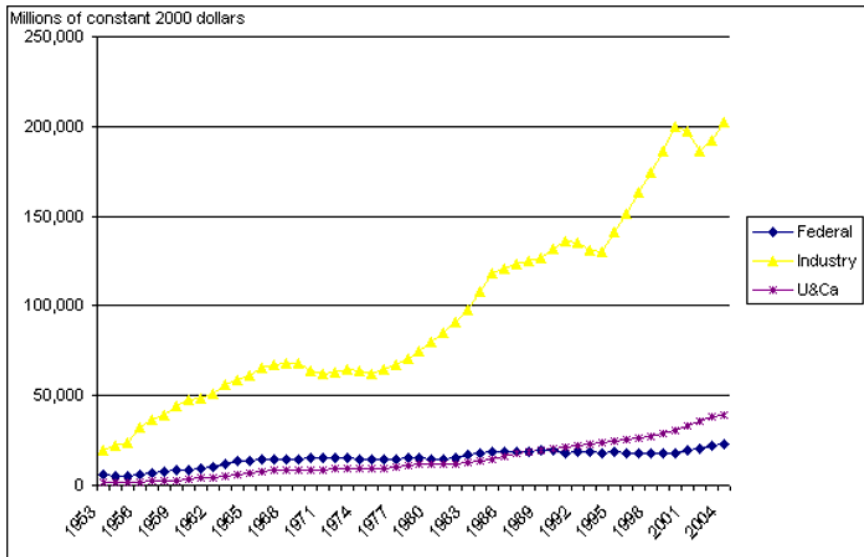


Fig. 6.3. R&D Total Work Performed by Sector (source: NSF 2006).

The Funding for the work performed comes from various sources. Industry is the largest contributor to R&D dollars spent in the US followed by federal investment. Universities account for a small amount of the

capital put into R&D efforts when federal funds are deducted from total university research funds – most university research funding is provided by federal grants. Figure 6.4 outlines the funding sources of all R&D in the US since 1953.

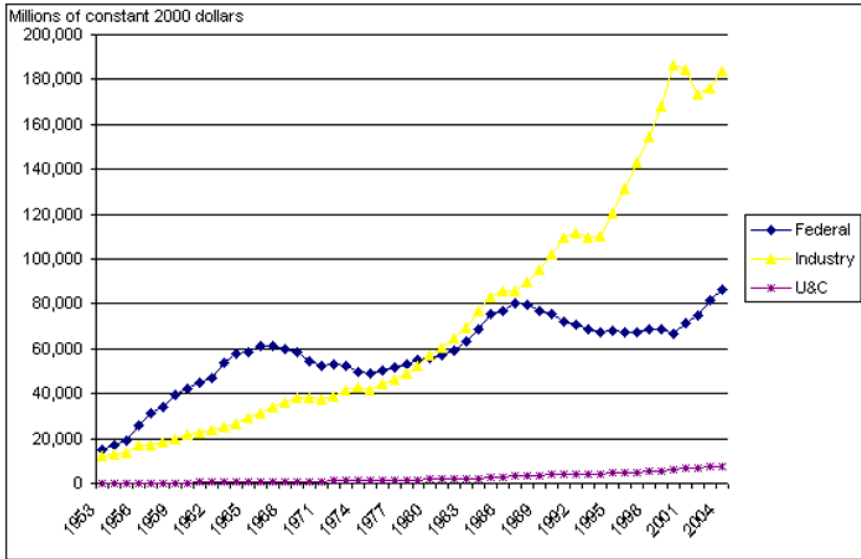


Fig. 6.4. R&D Total Work Funded by Sector (source: NSF 2006).

Federal R&D funding has changed dramatically in recent years. Federal funds provided to industrial research has had more ups and downs while federal funding for university based R&D has had a more constant pattern of growth. Historically federal funding for industry research exceeded funding for university research, but in 2000 the order reversed with federal funding to universities exceeding federal funding for internal research which exceeded funding for industrial research. This is a significant change worth noting. It is unclear if this relationship will persist.

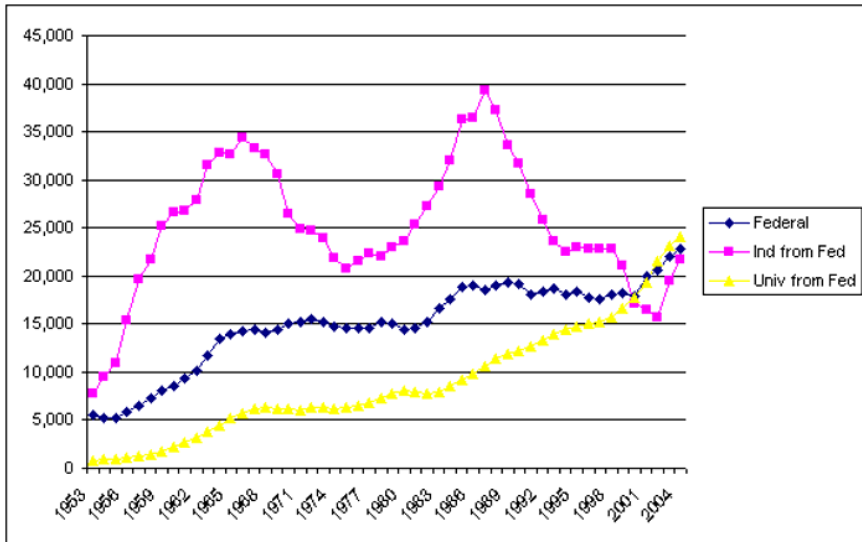


Fig. 6.5. Federal, Industry and University R&D from Federal Funding Sources (source: NSF 2006).

6.2.5 Economy Shift from Managed to Entrepreneurial Economy

Many scholars would agree that the US has move from a Managed Economy to an Entrepreneurial Economy (Audretsch 2001). This has had a fundamental impact on how organizations and corporations in the US operate. Not everything is crystal clear in the words of David Audretsch “the entrepreneurial economy is sufficiently new and still incipient as to preclude anything approaching comparable scholarship [to the managed economy]”¹. While scholars continue to research the nuances many of the largest difference between the managed and entrepreneurial economy have been researched and identified.

This paper will review three main areas including: 1) a shift in innovation from large to small firms, 2) changes from corporate lifetime jobs to individuals managing their own careers and 3) shifts from hierarchical to networked structures.

¹ Audretsch, D. B. A. R. T. (2001). What’s new about the new Economy? Sources of Growth in the Managed and Entrepreneurial Economies. Bloomington, Institute for Development Strategies: 39, p. 3.

Managed Economy	Entrepreneurial Economy
1. Large Firm Innovation	1. Small Firm Innovation
2. Corporation lifetime jobs	2. Individual Manage Own Career
3. Hierarchy Structure	3. Networked Structure

Fig. 6.6. Three shifts in the Entrepreneurial Economy.

This paper examines the organization of university technology transfer offices in the context of these three shifts in the entrepreneurial economy of today. Have universities been successful at supporting entrepreneurship, and if not what are some of the roadblocks that should be addressed?

6.3 Research Question

History shows that there have been fundamental shifts in our economy but have universities adapted to this new world? Data shows that more R&D dollars have gone into universities and that universities are being awarded more patents but the evidence is weak that these new technologies have really made it out to the marketplace. The research indicates that there have been three fundament shifts in the entrepreneurial economy of today which begs the questions do universities have the best structure to accommodate this shift?

6.4 Hypothesis

There are three main shifts outlined in this paper that have changed from the managed economy to the entrepreneurial economy. This paper wants to explore if universities have caught up with the new economy. The hypothesis below are constructed from the viewpoint of the entrepreneurial economy. For example hypothesis #1 is constructed that the university is focused on small firm formation a phenomena of the entrepreneurial economy. If true then universities have caught up with the entrepreneurial

economy if false they need to make some changes to move from the managed economy into the entrepreneurial economy.

H1: The university TTO is focused on small firm formation

H2: The university TTO policies support individual career management

H3: The university TTO is a networked organization

6.5 Methodology

This paper reviews historical trends and three university spin-off case studies. The three spin-off firms included: a SBIR firm from University of Kansas, a software spin-off firm from George Mason University and a product company from John Hopkins University. All of these companies have received funding and grown beyond their initial start-up phase.

The first company is Thunderhead Engineering a software simulation spin-off of Kansas State University in Manhattan, Kansas, two hours to the west of Kansas City. The company was founded by in 1998 Professor, Daniel Swenson and a Master's degree student, Brian Hardeman, both from the Department of Mechanical and Nuclear Engineering in Kansas State University. Thunderhead Engineering's first big break was receiving their first Small Business Investment Research SBIR award of around \$100,000 for the Department of Energy. They also received three additional Phase I SBIR awards each around \$100,000 and three additional Phase II SBIR awards each around \$500,000 during the company's history.

The second company is Fortius One, a software company out of George Mason University. Fortius One developed tool and systems to model complex networks such as telecommunication fiber network. Fortius One technology was developed as part of the doctorate thesis research from a PhD student, Sean Gorman, in the School of Public Policy. After finishing his PhD he continued his research in post-doctorate position at the university for one year before spinning the company outside the university walls. The company worked with the TTO to patent the technology and also got a formal agreement with the university to spin-off giving the university royalties off use the patent. Fortius One raised two rounds of venture capital financing totaling over \$6 million.

The third company is Sensics, a product company that has developed a 3-D visual headset to help engineering companies such as automotive visualize cars they are developing. Sensics is a spin out of John Hopkins University in Maryland and also received an SBIR award.

6.6 Analysis

6.6.1 Shift from Large to Small Firms

One “common trend” of consistency in the new entrepreneurial economy is the increased role of new firm formation (Audretsch 2001). Entrepreneurship and new firm formation has become so synonymous that firm creation has become one of the common metrics for measuring entrepreneurship (Shane 2003).

It is important to put this in context, large corporations still exist in the US and play a role in the economy but the competitive advantage is limited. This differs from the Schumpeterian view of the managed economy “that innovation and technological change lie in the domain of large corporations and that small business would fade away as the victim of its own inefficiencies” (Acs 2005, p5). Current research has argued that breakthrough technologies are more successful in new firms without the legacy of infrastructure and management trying to defend existing products (Links 1990). The consensus is “small and medium size enterprises apparently are better able to exploit their university-base associations and generate innovations” (Acs 2005, p6).

As can be seen in the figure 6.7 below there has been a steady increase in university patents starting in the 1980s at the time the Bayh-Dole Act was passed. Since 1980 patents awarded to universities have increased over ten fold from 967 patents granted in 1980 to 11,381 university patents in 2001. While the licensing data unfortunately is not available before 1991 it is clear that the trend is upward but nowhere near the magnitude of Patents. University licenses in the past ten years have almost doubled from 1,229 licenses in 1991 to 2,403 licenses in 2001. University spin-offs have seen almost no change in the past ten years. They started out low and they remain low, which is a large concern. It should be noted that the Association of University and Technology Managers (AUTM) was the source for the licenses and spin-off data in Figure 6.2 and from the words of Lesa Mitchell, a innovations leader at the Kauffman Foundation, warned that “AUTM data on spin-offs is highly suspect.” Universities only report the spin-offs or small start-up firm that have formally come through the Technology Transfer office. Many spin-offs never use the university resources for patenting and spin-offs with the university knowing and other times the university exaggerates their numbers by including a project that is not yet incorporated. The AUTM survey has around 200 university participants and in 1994 the AUTM data indicated only 75 spin-offs and in

2001 this value increased by around 25% to 101 spin-offs. This would indicate that half of top research universities had no spin-offs at all in 2001.

After looking at the data in more detail the result show us that the Bayh-Dole Act appears to have had a massive positive impact on university patent and licenses to a small degree but when you investigate true commercialization as measured by spin-off the Bayh-Dole Act would receive a grade of an F.

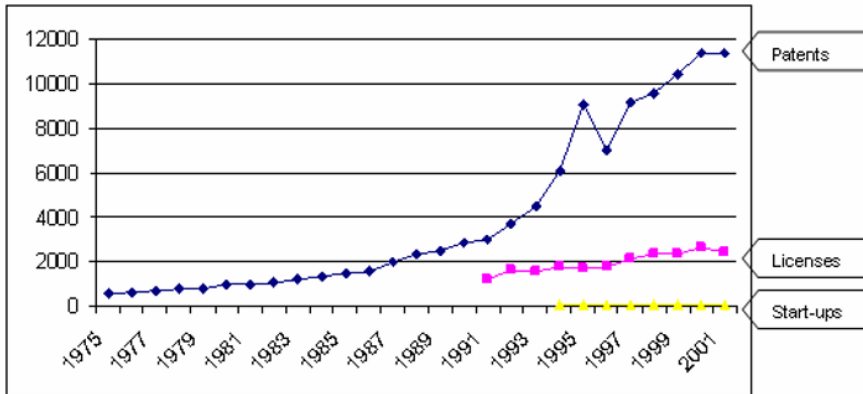


Fig. 6.7. University trends for Patents, Licenses and Spin-offs (source: USPTO & AUTM 2004).

In looking at the traditional university technology development model it is clear there is a “kink” in the hose of entrepreneurship in spin-offs. This can be clearly seen from the growth statistics which show that spin-offs have barely grown at less than 3% a year for the past 10 years. Currently for every two universities there is less than one spin-off company that is created.

If you put your foot on a water hose eventually the pressure builds up and a hole is created before the blockage to relieve the pressure. This is precisely what has happened in universities thought out the U.S. in the biotechnology field. The Audretsch study of top university scientist funded by National Cancer Institute found there are two distinct routes for spin-offs of university knowledge (Audretsch 2006). These two different routes are depicted on Figure 6.8. The traditional route is the Technology Transfer Office (TTO) route where the researcher patents the innovation though the TTO and then completes an agreement with the TTO to create a firm that commercializes the innovation. The other route, Entrepreneurial Spin-offs is where a professor does not use the TTO and does everything with out the help and perhaps blessing of the university.

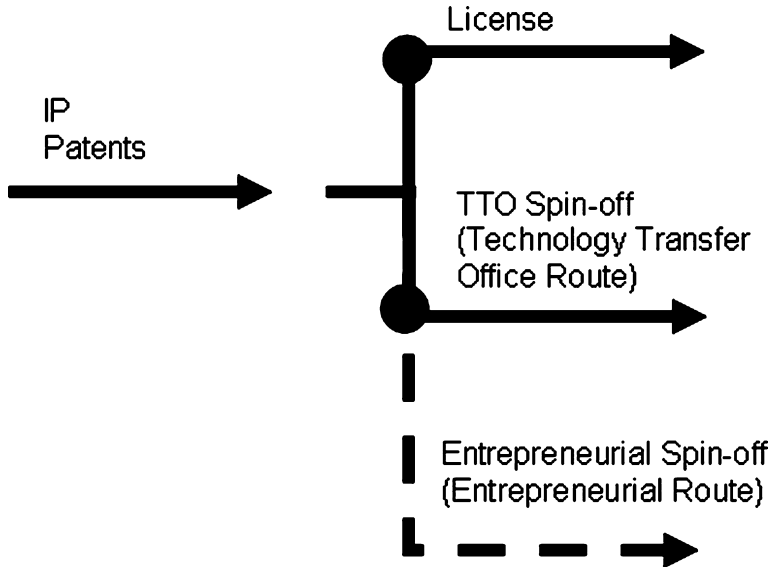


Fig. 6.8. New Model of University Development.

In the three spin-off case studies, two took the TTO route (Sensics & Fortius One) and the other (Thunderhead) the entrepreneurial route. In discussions with Fortius One it became clear that they were frustrated with the time it took for formalize the legal relationship with the university. In the end it took over a year to finish the legal documentation in order for the spin-off to get off the ground. Because spin-offs are so rare in most universities (one every two years on average according to AUTM data) there is not a lot of experience in the TTO in negotiating and completing legal documentation of spin-offs. This is not the fault of the individuals working at the TTO but more a concern with the system and policies of the university. Many times they are understaffed or lack experience of deal structuring.

Sensics also experienced great frustration with the time and effort it took to eventually get a license from John Hopkins. Larry explained “it was not particular quick and easy and took a lot of effort and time on my part. It [obtaining the license and spinning-off the company] would not have happened if I had not personally kept on top of the whole process.”

Thunderhead did not use the TTO at all and took what is coined as the “entrepreneurial route” (Audretsch 2006, p3) or “back door” approach. After the initial SBIR award they went about commercializing the software they had created from the government grant. They approached the university TTO to learn about how they could help them but were shocked with

what they heard. From the word of Brain Hardeman, founder of Thunderhead, “It was eye opening for us being engineers and not business men at the time. Learning more about licensing and what they want keep hold of and what they did not want to keep hold of.”

This was in 1996 when in his words “at the time when universities around the country were tightening down on intellectual property.” He went on further to say that “The TTO wanted an upfront payment of \$10,000 – 20,000. As a new start-up we did not have this at the time. As an established business this might be practical but at the time it was not an option. Also the technology we had developed was software that could not be patented so we decided not to license anything from K-states TTO.”

It was clear from the three case studies that the university TTO had developed a licensing model for large firms not spin-offs or small firms. As Brian further explains: “They [the tech transfer office] did not have much thought for the small business because in their mind any small business is a lifestyle business and not a growth business. They did not want to give any kind of help because they said ‘that is a lifestyle business’”. Brian also qualified this by saying that the attitudes and processes may be changing with the arrival of a new head of the Technology Transfer office.

6.6.2 Shift from Corporate Lifetime Jobs to Individual Managed Careers

“Secure, lifetime jobs are... in decline” (Cappelli 2000, p11) summarizes the shift, which has occurred in the new entrepreneurial economy. This has cause a change in power where the employee may have more negotiating ability than before. Employees also have more instability in the wake of restructuring and outsourcing. The mobility has been an advantage for young entrepreneurial firms because they have a larger available workforce that is attracted by the stock options and hopes of success.

“Tenure” is the holly grail as a professor and still a practice of most universities. Being a professor is one of the occupations that many people still remain at for life. Sometimes the blessing can also be a curse, because the golden handcuffs are so good many professor do not want to leave their university job if it will not be there when they return. This is confirmed by a study of job patterns indicating that “age and tenure are negatively correlated with job mobility” (Groot 1997, p380).

This is a concern because a new start-up needs the inside the head of the inventor to get off the ground. While a number of different skills are

needed for a start-up company to succeed many functional areas such as marketing or accounting can be filled by staff brought in from the outside. However, in the early days many innovations are in the head of the inventors and without the knowledge of the inventor the start-up would be dead before it started.

Fortius One was able to get a jump start on the firm because of the university policy that research staff and faculty were able to work one day a week outside the university. In addition the founder, Sean Gorman, was given lots of latitude from his faculty advisor, Roger Stough, to take his research and make it into a company. "There is no doubt that this company would not have happen if I was not at George Mason University, in the School of Public Policy in particular with Roger Stough as my advisor. George Mason University provided me with the initial press and my advisor Roger Stough gave me the freedom and support to focus on venture capital financing needed to get the company off the ground."

Sensics founders Larry and Marc knew from early on that they wanted to eventually leave the university and develop a company with the research they had developed. While they were personally motivated to develop an individually managed career and start their own firm the university lacked information to help them not take the traditional university research lifetime job. Larry explained that it would have been very helpful if the university would have a policy or system that explained how it [creating a spin-off company with university license] works, clearly outlined the steps 1, 2, 3 and make the administrative and legal side make clear for individuals wanting to spin-off new firms with university licenses." He believed John Hopkins had "about zero support for spin-offs." He received most of his guidance from local resources such as MAVA, TEDCO, Dingman and a local incubator where they first office was. Even if the policies were in place Larry still believed that a shift in the culture was also needed. He explained, "I have heard that there are universities that are more nurturing & helpful. John Hopkins just did not have that kind of culture." He also felt that there are many universities that are worse than John Hopkins in encouraging entrepreneurship and individually managed careers.

Because Thunderhead choose the entrepreneurial route it was important that they were able to take working time off from the universities to work on the start-up. It was important for Thunderhead to maintain a clear line of the time Mr. Hardeman and Dr. Swanson spent with the company and the university. Because Mr. Hardeman had completed his master program it was an easy transition to become a full-time employees of Thunderhead the timing of NSF grant was ideal to be able to pay his salary.

Professor Swanson was really careful with my time and tried to maintain that line between time spent at Kansas State and Sensics. He felt very fortunate that he was able to do this. Timing worked out well where he was eligible for a sabbatical and felt Kansas State was “very nice” to him. At Kansas State faculty are eligible for a sabbatical about every ten years and while on sabbatical Kansas State pays roughly half their salary. This made it a very “clean thing” with DOE [Department of Energy for the SBIR] where 100% of his time was on Thunderhead and 50% of his salary was being paid by State. The second employee of Thunderhead was a student completing his PhD and the timing of starting a company to create his own job was also ideal.

Clearly the policy of Kansas State allowed Thunderhead to start, and without it, it is questionable if the firm would have been formed. However, the timing of a new invention may not always match a universities rigorous sabbatical policy. Policies that allow individuals to take time off to explore entrepreneurial activity would not only increase the spin-off rate but would make the professor more rounded when they came back to their professor positions. University policies on leave of absence to pursue a start-up or other adventure differ from university to university.

6.6.3 Shift from Hierarchal to Networked

In the managed economy many large multinational companies such as General Motors and Sears enjoyed great success with a large, hierarchal structure. However, these firms are now only seen in the press because of layoffs or negative news (Bartlett 1993).

This shift is clearly articulated in Bartlett and Ghoshal M-Form paper (1993) by explaining:

The structural philosophy implies a significantly different distribution of corporate assets and resources. In contrast to the classic M-form where control over most resources is held at the corporate level, in the new model, resources are decentralized to the front-line units which operate with limited dependence on the corporate parent for technological, financial or human resources, but with considerable interdependence among themselves. In turn, this approach allows a drastic reduction in supervisory layer and the size of the staff groups each level of management needs.

It is clear that those companies, which are prospering, are organized in a networked or matrix structure. Hierarchical decision-making is too time consuming and costly for organizations in the entrepreneurial economy (Bartlett 1993).

Technology Transfer Offices (TTO) normally has the sole responsibility for patenting and licensing activities in universities. TTOs are a hierarchical structure of one place where all commercialization activity is expected to take place. University administrators typically staff these offices and their previous experience is normally from other university departments such as alumni relations or career services. The TTO are relatively small offices some consisting of only one person but few larger than a half dozen. It is difficult if not impossible for a TTO of three people to have the knowledge from biotechnology to software and business processes necessary to even pick the right inventions to patent let alone know all of the contacts in the field from suppliers to investors to properly market, licenses or pull together a team to spin-off a new firm.

Fortius One was happy with the flexibility the TTO provided them. "I thought it was very positive that we were able to struck an agreement [with the TTO] that has not hindered the company in being able to raise two additional rounds of institutional venture capital financing. However, it was clear the TTO did not have much experience with start-ups – I think we were the first start-up that was not a side business. There was a lot of learning that had to happen and it took longer than I would have liked."

Thunderhead also experienced the lack of start-up experience with Kansas State's TTO. "They [the TTO office] really look at us as a small lifestyle business and did not provide a lot of assistance. I understand that we were not big enough for them to spend their resources on." founder Brain explained. While Brain may have been understanding of the TTO perhaps they missed an opportunity since his company has continued to grow since they left the university and now has international customers of their product.

The findings are not intended to be an attack on the individuals working in TTOs. They are hard working and intelligent individuals. It is the system that needs changing to empower the appropriate individuals involved in commercialization of university technology to succeed.

There is an additional issue that must be addressed which is an inappropriate reward system. Most TTO administrators are salaried employees without the benefit of financial incentives related to production. While they may be measured on the number of patents obtained or revenue received from patenting there is little compensation to go along with success and I have never heard of any TTO administrator that received

any equity or other compensation of a spin-off. In other words there is no reward for success of a spin-off and little for the number of spin-offs that occur.

6.7 Conclusions

Universities R&D has grown but there remain a number of gaps between current university systems for capitalizing on in-house technological development and the fundamental shifts in the new entrepreneurial economy. This analysis has illustrated that university TTOs are primarily focused on licensing patents to large corporations as their only form of commercializing and as such are ill equipped to contribute to the entrepreneurial economy. This gap in firm formation from universities is highlighted by the fact that many faculty take an alternate route to entrepreneurial firm establishment, one which from the beginning does not include the university's TTO . While the economy has changed to one of individuals managing their own careers universities have a culture and system that encourage professors not to take risks with spin-offs. Universities whose policies permit or encourage spin-off activity have seen some successes. Finally the infrastructure of the TTO is hierarchal model that is not conducive to spin-off activity.

Table 6.1. Conclusions and Recommendations.

H1: the university TTO is focused on small firm formation	FALSE
RECOMMENDATION 1:	
1. Policies, programs, infrastructure, culture shift to support firm formation	
2. Federal grants track, review and include firm formation as grant funding requirement	
H2: The university TTO policies support individual career management	TRUE but minimal
RECOMMENDATION 2: More flexible policies that support individual career management and firm formation	
H3: The university TTO is a networked organization	FALSE
RECOMMENDATION 3: Free agent model	

With this new insight new policy recommendation are outlined. Three specific recommendations from these findings that could help universities improve their commercialization's success.

First, the findings show that firm formation is important for commercialization but that universities are weak in this area. To improve this both an internally and external approach is recommended. In order for real change to happen it must start from the funding source or external source. Since the government is the source of the growth in R&D the changes need to be mandated from the agencies, which are investing the R&D to universities of taxpayers' money. Most importantly there needs to be commercialization criteria that impacts R&D grants. All universities will be encouraged to commercialize innovations and allow American to enjoy the benefits of medical and scientific advancements. In addition universities need to review their internal policies and ensure they are firm formation friendly. This would include no upfront fees or other difficult hurdles for new firms. The process should also be transparent and quick to execute.

Second it would found that universities polices have limit capabilities for professors to work outside the university and become involved with a start-up. In the case studies we investigate there was the ability of 1 day per week and a sabbatical after a number of year of service. In both of those examples it is likely with out those policies that the firms would not have been established. However, it is clear with even more flexibility in the policies even more employees would start-up firms. Sticking a balance is important and non-trivial. This paper recommends policies that would allow for individuals to work with a start-up for up to at least 2 years regardless of year of service without loosing their job. This should be only for the purpose of commercializing a university technology and other policies such as maternity or research sabbaticals should be review independently and not the subject of this paper.

Finally, the most important area of change needed is the infrastructure of the university. Most universities today have developed a hierarchal structure with the TTO office as the funnel, which at times has become clogged. Research shows a networked organization is more effective in the entrepreneurial economy yet none of the research shows any university that has developed such a structure. The recommendation is to allow the inventor to be a free agent and work with internal or external resources for patenting, marketing and developing their invention. Clearly this is a complex issue and a number of details would need to be addressed in order to make the "free agent" model successful. Standard and transparent legal documents would need to be developed and expenditure policies would need to be established. Coordination, training and information sharing may

also need to take place internally on the campus. External participants need to be rewarded for their efforts if top-class professionals (such as attorneys, accountants, CTO, CEO, CMO, etc) are going to get involved. This could take the form of consulting fees, warrants, options or other compensation such as reduced tuition. While all the details have not been flushed out in this paper the principal remains clear, a free agent model would allow a network organization in universities and allow more firm formation to flourish.

6.8 Future Research

While this research gives an overview and understanding of the problems with TTO it was a limited in the data collected and analyzed. It is proposed to do a more in depth quantitative research based on interviews with a statistically significant number of professors, students and administrations involved in commercialization their inventions through a survey and outcomes.

In addition, more research into the details a free agent model should be explored with a roundtable of university stakeholders including individuals from presidents' office, technology transfer office, and professor and student from different departments.

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7. Simulating the Impact of Policy on Entrepreneurship

Ryan Sutter

7.1 Introduction

The structure of the American Economy has undergone tremendous changes over the last half century to be sure. Baumol et al. (2006) has described these changes as resulting from the transition from a managerial economy to what the authors denote an entrepreneurial economy. These changes are most notable when thinking about the Information Technology revolution occurring over that last decade or two and its unprecedented stream of innovative activity stemming from start-up companies. An emerging consensus on the reality of this transition has led to a re-emergence of interest in the process of entrepreneurship as a driver of economic growth (Acs and Audretsch, 2004; Shane, 2003; Acs and Armington, 2006; Baumol et al., 2006; as a few examples).

In light of this emerging consensus, academics and government officials have begun to reconsider the relationship between public policy and entrepreneurship in a post-industrial knowledge-intensive entrepreneurial economy (Hart, 2003; Holtz-Eakin and Rosen, 2004; Lundstrom and Stevenson, (2005); as some examples). The basic questions being asked involve: What affects can policy have on entrepreneurship? What role does public policy play in an entrepreneurial economy and what should a policy seeking to enhance entrepreneurship look like? However, public officials have not waited for theory to reach consensus on the subject; they have been implementing policies such as those in support of enterprise development at an accelerating rate.

Other policies still in the formulation stage take a more comprehensive approach to promoting entrepreneurship. This type of approach takes the viewpoint that entrepreneurship policy is much more involved than simply promoting enterprise development. Entrepreneurship, in these types of

proposals, is taken to be a system intrinsically emerging from society. Therefore, it is the whole of the social system that ought to be examined.

One such policy formulation, “A Roadmap for an Entrepreneurial Economy”, is ongoing at the Kauffman Foundation. In this proposal, entrepreneurship policy has been described as a wide-ranging suite of public policies influencing entrepreneurial activities. The policies contained in this document range from policies affecting taxation and education to immigration and intellectual property rights.

The picture of entrepreneurship policy painted by the Kauffman proposal looks more like a smorgasbord of policies influencing individuals in such a way as to enhance entrepreneurial activities rather than a single or target specific policy. As a result, the proposal is very broad and presents the notion that entrepreneurship policy should really be thought of as public policy for an entrepreneurial economy rather than a directed stand-alone policy for entrepreneurship. The overall goal of the proposal is to increase U.S. productivity using the enhancement of entrepreneurship as the specific vehicle to achieving this end.

Going back to the three questions posed above, it seems both necessary and interesting to ask what impact would the implementation of the policies proposed in the Kauffman Foundations’ “A Roadmap for and Entrepreneurial Economy” have on entrepreneurial activities, supposing that the specific policy instruments act in accordance with the expectations contained in the proposal? Answering this question would provide considerable insights into the policies that influence the entrepreneurial system at a very basic and general level.

The fundamental goal of the current research is to generalize the policy proposals contained in the Kauffman “Roadmap” to their most basic dimension of effect¹ and assess the relative importance of each of the specific dimensions to entrepreneurship using simulation. The assessment will be made by, first classifying the broad spectrum of policies contained in the Kauffman “Roadmap” along four different dimensions:

1. Policies affecting the stream of new business routines or innovations.
2. Policies affecting the tendency for individuals to engage in entrepreneurial activities.
3. Policies affecting the quality of available human capital.
4. Policies affecting the availability of financial capital for start-ups.

¹ Dimension of effect is a term used to describe the notion that almost all of the policies contained in the “Roadmap” influence one of four things. Most influence either: the tendency for entrepreneurial action, the quality of human capital, the availability of financial capital, or the stream of new business routines/nnovations. This topic will be discussed in detail in section 2.

After the policies have been adequately classified, simulation modeling will be utilized in an effort to investigate the relative importance of each of the four policy dimensions on entrepreneurial activities². This analysis will help shed light on which sets of policies are likely to enhance U.S. productivity, through entrepreneurship.

The layout of this paper is as follows. Section 2 will discuss the details regarding the classification of the specific policies contained in the Kauffman foundation's entrepreneurship policy draft proposal (the "Roadmap") according to the four dimensions introduced above. Section 3 will discuss the Schumpeterian concept of the entrepreneur in an effort to establish the framework forming the basis of the simulation modeling that will be utilized. Section 4 will then present the specific structure of the simulation model that will be used for analysis. Section 5 will present the simulation results and Section 6 will provide some discussion and draw some conclusions regarding which dimensions of policy are likely to enhance the system of entrepreneurship. The goal is to be as general as possible so that the resulting conclusions pertain not only to the Kauffman Foundation and its work on entrepreneurship policy, but rather, are relevant to the broader policy community at large.

7.2 Generalizing Entrepreneurship Policy along Its Dimension of Effect

Nearly all of the specific policies contained in the Kauffman Foundation's "Roadmap" can be classified according to their specific dimension of effect. More clearly, nearly every proposed policy affects either the tendency for entrepreneurial action (TEA), the quality of human capital (QHC), the availability of financial capital (AFC), or the stream of new business routines/innovations (NRI). For instance, starting with the first of the federal-level policies, the fiscal challenge policy issue, the "Roadmap" recommends that the federal government broaden the tax base in much the same manner as was done during the Reagan administration of the 1980's. The rationale for this recommendation³ is that in the coming years the

² Those policies that do not fall into any of above categories will be left out of the analysis.

³ The rationale stated here only applies to its inclusion as a policy area, leaving out the reasons as to why this policy was chosen over the alternatives to addressing the budget deficit, such as a consumption tax. Readers interested in this issue should refer to the Kauffman Foundation document.

projected budget deficits are growing in terms of the ratio of the federal deficit to GDP and so must be addressed in some form. The growing budget deficit to GDP ratio, coupled with, uncertainties associated with how the federal government should deal with this problem have the affect of increasing uncertainty to potential entrepreneurs. Increased uncertainty decreases the tendency for entrepreneurial action (TEA) as entrepreneurs are responsible for bearing the full weight of true uncertainty (Knight, 1921). Therefore, the fiscal challenge policy issue area can be categorized as a policy issue affecting a dimension of entrepreneurship involving the tendency for entrepreneurial action (TEA).

Five policy proposals dealing with the education policy issue are contained in the “Roadmap”. These proposals can be summarized as follows:

1. Allow or create incentives that will stimulate educators to be entrepreneurial (i.e. allow them to experiment with alternative educational techniques).
2. Allow families to choose the school they send their children to.
3. Increase the financial incentives for teachers of math and science.
4. Increase openness to the use of alternative techniques and technologies used in teaching math and science.
5. Increase teaching about entrepreneurship as an employment option.

Examining the five policy proposals under the education policy issue area reveals that of the five proposals, four of them seem to influence the quality of human capital (QHC), those being proposals 1-4. Proposal five would seem to influence the tendency for entrepreneurial action (TEA), as educating individuals about the potential of entrepreneurship as a career path would increase the odds that an individual considers this choice in their lifetime. However, for the most part, the education policy issues influence the quality of human capital (QHC) and so this policy issue is classified according to the quality of human capital (QHC) dimension.

Two policies are proposed in the Litigation/Regulation policy issue area. Those proposals being: 1. to remain committed to the use of cost/benefit analysis to gauge the impact of proposed regulations, along with making appropriate allowances for streamlined procedures for new businesses that are at a cost disadvantage in complying with the regulations and 2. federalize product liability law. Both of these proposals influence the tendency for entrepreneurial action (TEA) as the former seeks to keep the cost of starting a business low and the latter seeks to decrease the level of uncertainty to potential entrepreneurs.

The last policy issue classified under the federal-level policy issue area in the Kauffman Foundation’s “Roadmap” is Science and Technology policy. One policy proposal pertains to this issue. This proposal is

associated with technology transfer offices used for commercializing and licensing university-based discoveries. The proposal is to encourage experimentation in the arrangements of the technology transfer offices of universities, possibly using federal funding as leverage for doing so. This policy seeks to increase the stream of new business routines/innovations (NRI) coming out of the American university system in an effort to increase the level of entrepreneurship.

There are four main issue areas classified as international-level policies in the Kauffman proposal. These issue areas are: Trade issues, Immigration issues, Access to Foreign Technology issues and Entrepreneurship Foreign Policy issues. Of these four issues, only two can be sorted into the dimensions of effect used in this paper. These two issue areas are Immigration issues and Access to Foreign Technology issues. Trade issues and Entrepreneurship Foreign Policy issues do not directly influence any of the four dimensions used in this paper and, therefore, they were excluded from the analysis.

Two specific policy proposals were contained in the Immigration issue area while one proposal was contained in the Access to Foreign Technology issue area. The two Immigration related policy proposals are to put more emphasis on the educational background of immigrants when granting admission into the U.S. and to grant automatic citizenship or permanent residency to foreign students that earn a degree in a technology related field. Both of these policy proposals seek to influence the quality of human capital (QHC). The thought here is that the more high quality individuals admitted into the United States, the higher the quality of human capital in the United States. The policy proposal classified under the Access to Foreign Technology issue area is to establish a body to translate foreign technical journals into English. This policy proposal seeks to influence the stream of new business routines/innovations (NRI) by easing American entrepreneurs' access to foreign technical advances.

Regional level issues present a considerable challenge to the simulation modeling utilized in this research. The incorporation of regional issues would require the construction of a simulation model that incorporates spatial dimensions into the analysis. However, the simulation model used here is aggregate, in nature, preventing the analysis of regional-level policies. Therefore, the policy proposals classified in the "Roadmap" as regional issues were excluded from the current analysis.

The final classification of issues utilized in the Kauffman "Roadmap" is at the individual-level or those issues that affect the entrepreneurial decision. There are six issue areas classified in this level: Easing Business Formation, Ensuring and Enhancing Labor Market Mobility, Health

Insurance, Legal Impediments, Ensuring Access to Financial Capital, and Appropriate Protection of Intellectual Property.

The first issue area addressed in the “Roadmap” is Easing Business Formation. Two policy proposals are directed at achieving this end. The first is to make it easier for new and existing firms to obtain and fill out the business and tax registration forms on the Internet. The second policy proposal is to re-examine the bankruptcy reforms passed by Congress in 2005 in an effort to determine how they might be modified to reduce the negative impacts that those reforms have had on entrepreneurial activities. Both of these policy proposals seem, then, to influence the tendency for entrepreneurial action (TEA). This first proposal seeks to reduce the costs of starting a business while the second seeks to reduce the costs associated with a business failure. While the policies affect the tendency for entrepreneurial action (TEA) from different perspectives, both seek to reduce the cost associated with entrepreneurial start-ups. As a result, policies aimed at easing business formation are classified along the tendency for entrepreneurial action (TEA) dimension.

One main policy proposal, contained in the “Roadmap”, is assigned to the Enhancing Labor Market Mobility issue area. This policy proposal is to supplement the unemployment insurance system with incentives for individuals to take another job quickly. The goal here is to enhance labor market mobility. Labor market mobility is considered important for entrepreneurship because many entrepreneurs have worked for multiple companies before starting an entrepreneurial venture (Kauffman, 2006). Therefore, this policy proposal is classified along the quality of human capital (QHC) dimension. This is due to the notion that individuals gain a diverse set of skills by working in different jobs for different companies. These different skill sets come together to positively influence the quality of the human capital of the individual. The third issue area addressed under the individual-level policy classification is the Health Insurance issue area. Two policy proposals are offered in this issue area. The first is to extend tax-free health savings accounts to individuals. This proposal seeks to increase entrepreneurial activities on the basis that individuals that are thinking of starting a company but are reluctant to do so, due to the loss of their health coverage, would be able to obtain lower cost health insurance on their own. The second proposal in this issue area is to allow small businesses to pool together to purchase health insurance. This would reduce the variability of health costs imposed on small businesses, facilitating the ability of entrepreneurs to attract a higher quality work force. Both of these proposals seem to influence the tendency for entrepreneurial action (TEA). If entrepreneurs could obtain and provide (to their future employees) low cost health insurance, they would be more likely to quit their current job

and start their own company. Therefore, the Health Insurance issue influences the tendency for entrepreneurial action (TEA) and, hence, it is categorized accordingly.

The fourth issue area is Legal Impediments. One policy proposal is contained in this issue area. This proposal is to err on the side of choosing shorter rather than longer periods for enforcing any non-compete clause at the state level. Shorter periods of non-compete clauses seem to influence the tendency for entrepreneurial action (TEA) as shorter periods enable a shorter time period between leaving a company and exploiting an innovation obtained there.

The fifth issue area addressed in this classification is Ensuring Access to Financial Capital. In this issue there are several policy proposals, however, it seems to be quite obvious that these policy proposals all seek to influence the availability of financial capital (AFC) and so no individual discussion of the specific policies is necessary here.

The final issue area addressed in “Roadmap” is the Appropriate Protection of Intellectual Property Rights. The “Roadmap” highlights the delicate trade-off between granting protection that is too long and protection that is too short. If the protection is granted to long, then legal barriers exist that prevent competition through entrepreneurial start-up companies. If the protection is granted for a period that is too short, then the incentives for innovating would be diminished.

The Kauffman “Roadmap” offers four proposals to help establish a better functioning Intellectual Property Rights regime. These proposals are: to increase funding or levy a patent application fee, loosening standards for legal challenges after patents are awarded, changing the current system of awarding patents to the first to file an application and to use the court system to establish what is an obvious innovation on a case by case basis in an effort to establish a more consistent system.

The policy proposals contained in the Intellectual property rights issue all seem to influence the tendency for entrepreneurial action (TEA). Therefore, this issue is classified in the TEA dimension.

Table 7.1. Summary of the “Roadmap” Issues and Category Assignments.

Policy Issue Area	Category Assignment
Federal-Level	
The Fiscal Challenge	TEA
Education	QHC
Litigation/Regulation	TEA
Science & Technology	NRI
International-Level	
Trade	Excluded
Immigration	QHC
Access to Foreign Technology	NRI
Shaping Entrepreneurship Foreign Policy	Excluded
Regional-level	Excluded
Individual-Level	
Easing Business Formation	TEA
Ensuring Labor Market Mobility	QHC
Health Insurance	TEA
Legal Impediments	TEA
Ensuring Access to Finance	AFC
Appropriate Protection of Intellectual Property	

Table 7.1 contains a summary of the information contained in Section 2. It lists all of the issue areas contained in the Kauffman “Roadmap” and identifies what dimension the issue area was assigned to (if it was assigned to a category).

7.3 The Entrepreneur and the Simulation Framework

Analyzing the impact of the policies contained in the “Roadmap” on entrepreneurship utilizing a simulation-based approach obviously requires the specification and construction of a simulation model. However, to motivate the structure of the specific simulation model, a brief discussion of the role of the entrepreneur and the framework within which it operates in the model is useful.

7.3.1 The Role of the Entrepreneur

The role of the entrepreneur as the agent of technical change has been discussed for centuries. The idea that technical change is brought about through the innovative action of individuals goes well back into the history of modern economic thought. The first person credited with discussing the entrepreneur's importance in economics seems to have been Cantillon, who wrote about the actions of the entrepreneur and her importance in the economic process. To Cantillon, entrepreneurs were responsible for the exploitation of price discrepancies, put simply, they engaged in game of arbitrage. Entrepreneurs paid a certain price for a product in order to resell it at an uncertain price. According to Cantillon then, entrepreneurs were actors that made decisions about resource allocation, subsequently bearing the risks associated with these decisions (Cantillon, 1755). Work by Turgot, Say, Marx, Badeau, Hayek, Knight as well as many others, have commented on the entrepreneur as an actor in the economic process, building on, or altering the role of the entrepreneur in it. For instance, to Jean Baptiste Say, entrepreneurs were people whom had exceptional insight into the needs of society and whom possessed the skills needed to create a new enterprise to fill those needs (Say, 1803). However, the contributions made by Joseph Schumpeter in the first half of the 20th century have been described as being the pivotal point in the research regarding the role of the entrepreneur in economics. It is with Schumpeter that a split seems to have occurred between orthodox economics and Schumpeter's more evolutionary view of economic change. It is with Schumpeter's study of the entrepreneur that equilibrium theory seems to have been most successfully abandoned and an alternative approach to the study of economic change applied (Nelson and Winter, 1982).

According to Schumpeter, the entrepreneur is the prime agent in brining about economic change. Entrepreneurship, according to Schumpeter, is a process of "creative destruction" whereby new products, inputs or processes replace old products, inputs or processes. The function of the entrepreneur is to innovate by creating new combinations of existing resources. It is important, however, to point out, as does Schumpeter, that entrepreneurship does not necessarily involve the invention of a new process or a new combination of resources (although Schumpeter acknowledges that she may invent), but rather, it involves bringing a new combination to the market (Schumpeter, 1947). In fact, Schumpeter made an explicit effort to distinguish between an inventor and an entrepreneur. The inventor is important in the sense that he produces a new idea, process, or scientific principle, however, as Schumpeter points out, "an idea or a scientific principle is not, by itself, of any importance for economic practice"

(Schumpeter, 1947; 152). The inventor is important for producing the idea, but it is the entrepreneur who “gets things done” (Schumpeter, 1947; 152). What the entrepreneur “gets done” is to bring an innovation to the market. Written in another way, the entrepreneur commercializes an innovation and brings it into the economic system. If an innovation remains outside the economic system, it remains useless to society at large, “The fact that Greek science had probably produced all that is necessary in order to construct a steam engine did not help the Greeks or Romans to build a steam engine” (Schumpeter, 1947; 152).

According to the Schumpeterian argument, the entrepreneur is the actor that alters the economic system. The entrepreneur introduces an innovation into the market and disrupts the state of the current system. The introduction of an innovation by an entrepreneur, then, is disequilibrating in the sense that it disrupts the status quo. However, it is disruptions that cause the economic system to evolve. What follows then is that, without entrepreneurs, nothing changes. The system is static in the absence of the entrepreneur.

7.3.2. An Evolutionary Approach to the Entrepreneur

An evolutionary approach to modeling the entrepreneurial process is to be understood as a process that determines and explains the complex process of economic change brought about by entrepreneurs. The evolutionary path of economic change is guided by sets of decision rules employed by actors (entrepreneurs) and, thus, firms (Nelson and Winter, 1982). Under this framework, the notion of maximizing behavior and its concomitant global objective function, well defined choice set, and maximizing choice rationalization of firms and their actions is rejected (Nelson and Winter, 1982).

In an evolutionary context, the decision rules on which firms base their actions can be described as ‘routines’ (Nelson and Winter, 1982). These routines play a role similar to the role genes play in the biological evolutionary process. The routines on which firms base their actions are described as persistent behavior based on the history of the firm and where it came from (Nelson and Winter, 1982). These routines are self-selecting in the sense that those firms brought about by entrepreneurs utilizing superior routines have a better chance of ‘survival’ and thus have a better chance at passing their routines on in the form of imitative future firms.

However, a stochastic element also exists within this evolutionary process. These stochastic elements spontaneously create new branches of routines facilitating radical shifts in the routines used by firms. As Nelson

and Winter (1982; 15) point out, “The fact that not all business behavior follows regular and predictable patterns is accommodated in evolutionary theory by recognizing that there are stochastic elements both in the determination of decisions and of decision outcomes”. The stochastic processes of which Nelson and Winter were discussing are quite analogous to ‘random mutations’ in biology.

The departure from orthodoxy tends to be centered on the notion that the decision rules regarding the behavior of firms are assumed to be a consequence of the time at which a decision takes place, as well as on the history of the given firm (Nelson and Winter, 1982). It seems logical to extend this line of logic to the entrepreneur, assuming that the entrepreneur initially creating the firm establishes the initial decision rules. It is through the processes of ‘natural selection’ that profitable firms (based on a set of given routines) will survive and less profitable firms will die. This means that the characteristics of more profitable firms will ‘live on’ and that the overall quality of firms will increase over time. Therefore, firm survival is dependent on ‘natural selection’ as well as on stochastic elements, analogous to spontaneous mutations in biology (note that these stochastic mutations can be both positive and negative). The core of evolutionary theory lies in the dynamic process that governs firm behavior over time. Bounded rationality of both the individual entrepreneurs and the firms they found is the assumption. Maximizing behavior over the entire range of information and possible actions is viewed as impossible and unrealistic (Nelson and Winter, 1982).

To analyze the impact of the policies proposed in the Kauffman Foundation’s “A Roadmap for an Entrepreneurial Economy” on entrepreneurship, a simulation model incorporating entrepreneurship and based on an evolutionary framework was constructed. This modeling framework was utilized because it enables the investigation of the impact of the policy proposals, through their specific dimension of effect, on entrepreneurship while utilizing a theoretical framework that well suits the incorporation of entrepreneurs.

7.4 The Structure of the Simulation Model

For the purposes of this research, a simulation model based on work by Grebel, Pyka and Hanusch (2001 and 2003) was constructed and utilized. Discussion of the structure of the simulation model will, therefore, draw heavily on their work, while at the same time incorporating slight adjustments to their models. The basic structure of the model relies on: the

generation of a set of actors, an actor matching process, an evolving entry threshold, a survival and exit criterion, as well as the impact of time dependent evolution.

To begin, a set of actors of size n is created. Each of the, n , actors are assigned a set of three randomly generated characteristics. These characteristics are based on three of the four dimensions defined in Section 2. These characteristics are: tendency for entrepreneurial action (TEA_i), quality of human capital (QHC_i) and available financial capital (AFC_i). This assignment is represented in relation 1

$$a_i = \{(TEA_i), (QHC_i), (AFC_i)\} \quad i = 1..n \quad (1)$$

Since an actor must have access to new knowledge (in the form of a new business routine, technology or innovation) in order to innovate, a set of new routines is generated based on a Poisson distribution described by relation 2.

$$(NRI_i) \sim P(n, \lambda) \quad (2)$$

The set of routines are defined to capture new innovations or technologies in the form of new inputs, processes or products. These routines drawn from a Poisson distribution with two parameters, n and λ , where n is set equal to the number of actors and λ is the mean (and variance) of the distribution. A Poisson distribution is utilized here to introduce a differentiated set of routines ranging from 0 to ∞ . The extent of the number of 0's, 1's, 2's, ect is determined by λ . Larger values of λ produce a distribution with a large mean and variance and hence produce and more varying set of routines. The incorporation of (NRI_i) is utilized to represent and analyze the fourth dimension policies defined in Section 2. Each value, NRI_i , is randomly assigned to an individual, completing the initialization of the set of actors, shown in relation 3, where i is the number of individuals and t is the time period.

$$A^t = \{(NRI_i^t), a_i^t\} \quad i = 1..n \text{ and } t = 1..T \quad (3)$$

At each iteration, t , k actors not already involved in a firm are permuted and brought together to form a potential firm pf_z^t , with an endowment shown in relation 4,

$$pf_z^t = \left(\sum_{i=1}^k NRI_i^t, \sum_{i=1}^k TEA_i^t, \sum_{i=1}^k QHC_i^t, \sum_{i=1}^k AFC_i^t \right) \quad z = 1..m \text{ and } t = 1..T \quad (4)$$

where z references the specific potential firm and m is the number of firms brought together in each time period. At each iteration, t , a firm's comprehensive endowment, ce_z^t is calculated according to relation 5.

$$ce_z^t = \left(\sum_{i=1}^k TEA^t + \sum_{i=1}^k QHC^t + \sum_{i=1}^k AFC^t \right) \quad (5)$$

If the firm's comprehensive endowment exceeds the entry threshold (ψ^t), shown in relation 6, and if the firm has access to a new routine (NRI_z is ≥ 1), then the potential firm becomes an existing firm F_{new}^t . If the firm's comprehensive endowment is $< \psi^t$ or if the potential firm does not have access to a new routine ($NRI_z < 1$), then the firm is not formed and the actors rejoin the total set of actors, A^t , and are then available for future potential firms, formed in subsequent time periods.

$$\psi^t = \psi^{t-1} - (t^\alpha Gr^{en} + t^\beta Gr^{ex}) \quad (6)$$

In relation 6, Gr^{en} is the growth rate of entry and Gr^{ex} is the growth rate of exit and α and β are time dependent weighting parameters.

Relation 6 shows that the entry threshold depends on: Gr^{en} , Gr^{ex} , t and the weighting parameters. This means that at each time period the entry threshold is subject to change, thereby influencing the decisions of potential firms to enter the market in the next time period. This means that a potential firm's decision regarding whether or not to enter a market depends, not only on their comprehensive endowment, but also on economic signals coming from past time periods.

Survival and exit is dependent on the firm's absorptive capacity of their aggregate human capital relative to their access to financial capital. If a firm has a favorable QHC_z^t to AFC_z^t ratio, then it is not threatened by exit as its level of human capital is high relative to its financial capital. In this situation, it is assumed that the firm is able to earn a sufficient return on its investment and it survives. However, if that ratio is unfavorable, then the firm is threatened by exit in the current or future time periods. In this situation, a firm is unable to fully absorb its financial capital by earning a sufficient return on its investment; as a result, its investment begins to dry up. A firm exits when its AFC_z^t is reduced to 0 according to relations 7 and 7.

$$\left(\begin{array}{l} w_z^t = 0 \xrightarrow{\text{if}} \frac{QHC_z^t}{AFC_z^t} \leq 1 \\ w_z^t = \frac{QHC_z^t}{AFC_z^t} \xrightarrow{\text{if}} \frac{QHC_z^t}{AFC_z^t} < 1 \end{array} \right) \quad (7)$$

$$AFC_z^t = AFC_z^{t-1} - \sigma * w_z^t \quad (8)$$

Firm quality is a function of a firm's human capital and the quality of its new business routine. Firms with higher levels of human capital endowments and better business routines will be associated with higher firm quality. Overall firm quality (OFQ) is the sum of firm quality, over all existing firms (M), calculated at each time period. Specifically, OFQ is calculated according to relation 9 and mean firm quality (MFQ) is calculated according to relation 10.

$$OFQ = \sum_{i=1}^M FQ = \left(\sum_{i=1}^M NRI * \sum_{i=1}^M QHC \right) \quad (9)$$

$$MFQ = \sum_{i=1}^M FQ / M = \left(\sum_{i=1}^M NRI * \sum_{i=1}^M QHC \right) / M \quad (10)$$

At the end of each time period, the entry threshold, the total number of firms, the total number of exits, and overall and mean firm quality is saved and updated accordingly. This procedure is done both to carry on the simulation as well as to present summary results following the end of the simulation run.

7.5 Simulation Results

Five sets of simulation results are presented both graphically and numerically. All of the results were obtained using the following parameter settings: $n = 100,000$, $m = 35$, $T = 100$, α and $\beta = 0.25$, $\lambda = 0.2$, $\sigma = 0.5$. The first set of results corresponds to the baseline case. This set of results will be used to compare to the subsequent sets of results in an effort to assess the impact of increasing each of the four category dimensions (TEA, QHC, AFC and NRI) by a factor of 1.5, *ceteris paribus*. If increasing a given dimension by 1.5 has an influential impact when compared to the baseline results, then evidence stemming from the simulation suggests that the given category dimension has an influential impact on entrepreneurial behavior. Note that the purpose of the current research is not to assess the impact of any specific policy, rather, the purpose is to assess the relative impacts of each of the four policy dimensions, defined in Section 2, on entrepreneurial outcomes.

The graphical results of simulation one are contained in Figure 7.1. The results demonstrate that, initially, few firms enter the market and that the

entry threshold is relatively high. However, as firms begin to enter the market, the entry threshold falls and more and more firms enter. This continues until competitive pressure sets in and the “less fit” firms, those firms that are unable to fully absorb their financial capital, begin to exit. Once firms begin to exit, the threshold begins to rise, signaling to future potential firms the market is not so favorable to entry. This is reflected by a decreasing number of entrants into the market. After a while, entry drops off to a trickle as does exit, eventually converging toward zero. The bottom graph in Figure 1 shows that average firm quality increases over time, as the “less fit” firms exit leaving only the “more fit”, firms, of a higher quality.

Overall, the baseline simulation output is quite consistent with a classic industry life cycle process. Initially there are few entrants and few exits. However, as time moves forward, the number of entrants surges as economic signals (represented by the entry threshold) indicates favorable market conditions for new entrants. Many of these new entrants are of lower quality than the initial entrants and as a result many of these entrants are unable to survive. As these firms begin to exit, economic signals begin to suggest less favorable market conditions for new entrants and entry drops off considerably. Lastly, as the number of exits tends toward zero, the entry threshold begins to stabilize and entry and exit begin to converge on zero.

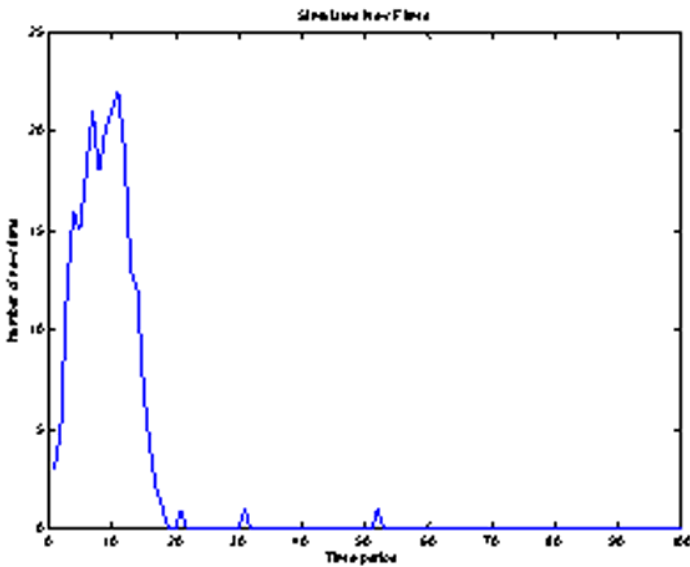


Fig. 7.1.A. Graphical Output from Baseline Simulation (new firms).

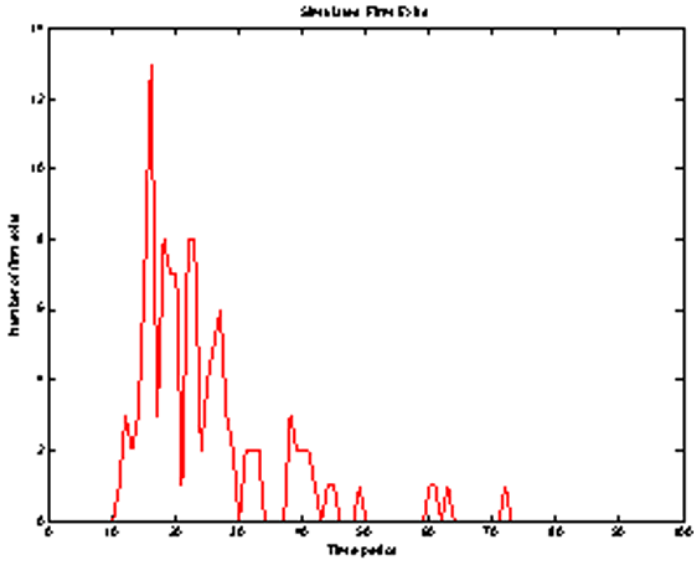


Fig. 7.1.B. Graphical Output from Baseline Simulation (firm exits).

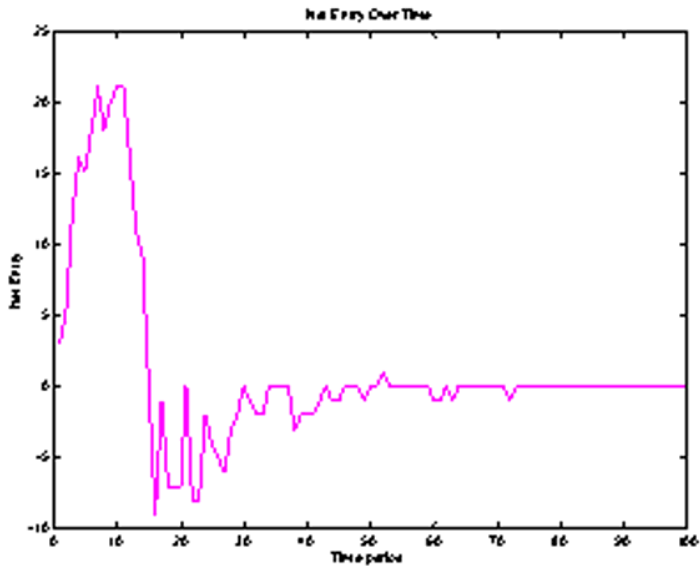


Fig. 7.1.C. Graphical Output from Baseline Simulation (new entry).

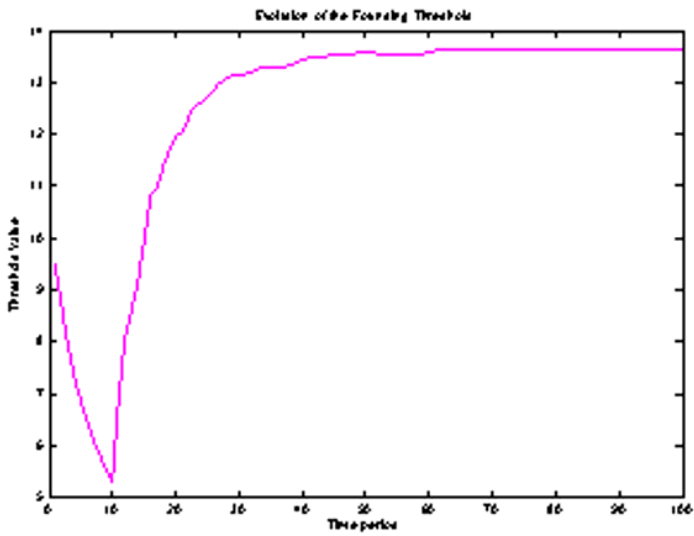


Fig. 7.1.D. Graphical Output Baseline Simulation (threshold value).

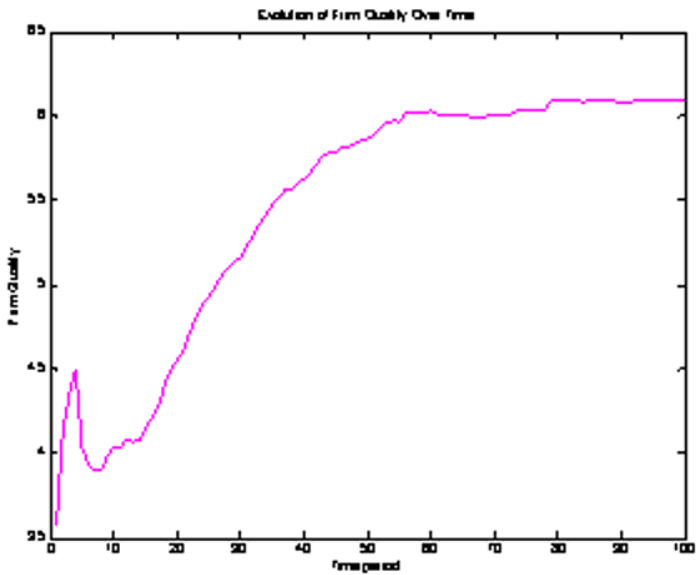


Fig. 7.1.E. Graphical Output Baseline Simulation (firm quality).

Table 7.2 contains the numerical results provided by the baseline simulation. Row 1 of Table 7.2 contains the total, mean and standard deviation of total firm entry. Row 2 contains the total, mean and standard deviation of total firm exits. Rows 3 and 4 contain the totals, means and standard deviations associated with total firm survival and overall firm quality. These results will be used as a comparison base for the subsequent sets of results so that an assessment of the impact of each policy dimension on entrepreneurial outcomes can be made.

Table 7.2. Baseline Simulation Results.

output	totals	mean	std
firm entry	227	2.27	6.0767
firm exit	119	1.19	2.3855
firm survival	108	1.08	3.6912
firm quality	492.2476	4.9225	0.5006

Figure 7.2 contains the graphical output associated with augmenting the tendency for entrepreneurial action (TEA) by a factor of 1.5 or 150%. The graphical results demonstrate that this simulation run behaved similarly to the baseline run, however, with slightly larger numbers of entrants and exits occurring at each of the iterations. The behavior of the evolution of the entry threshold as well as the behavior of overall firm quality follows the same pattern as in Figure 1.

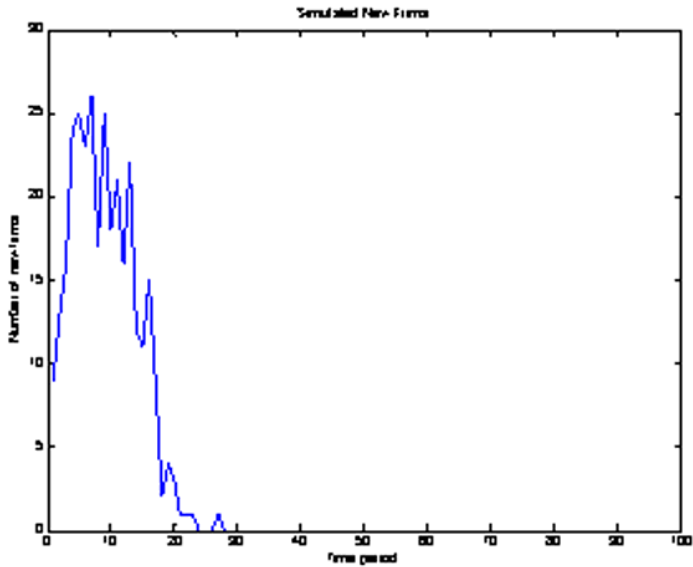


Fig. 7.2.A. Graphical Output from 150% TEA Augmentation (new firms).

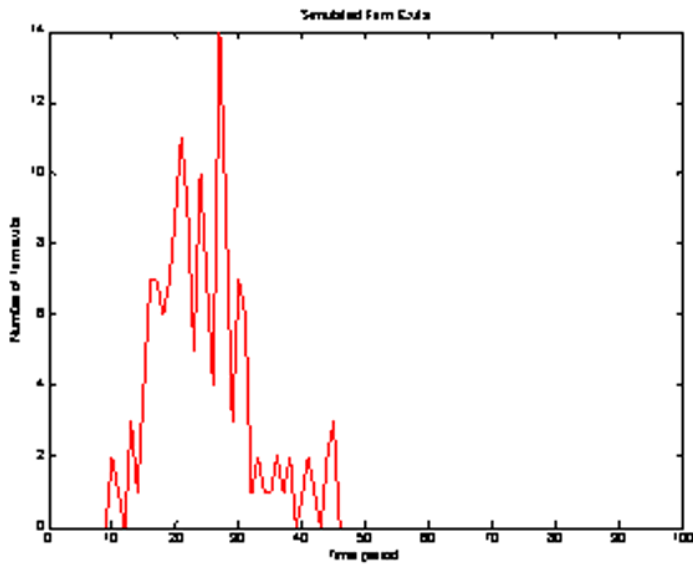


Fig. 7.2.B. Graphical Output from 150% TEA Augmentation (firm exits).

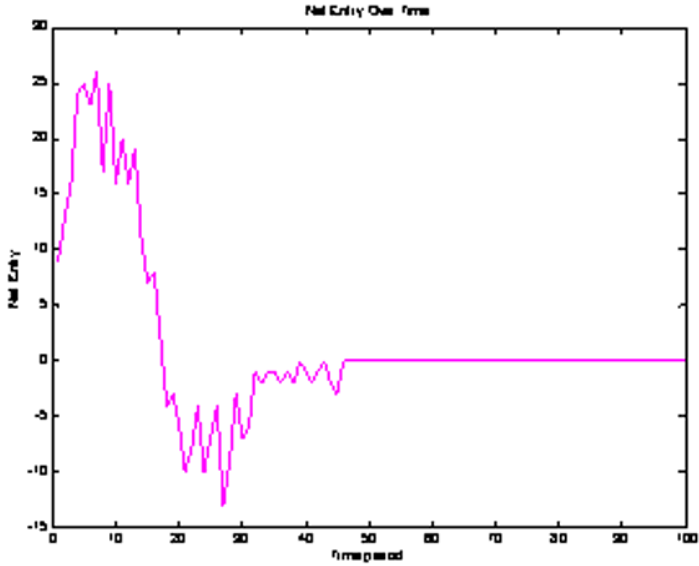


Fig. 7.2.C. Graphical Output from 150% TEA Augmentation (new entry).

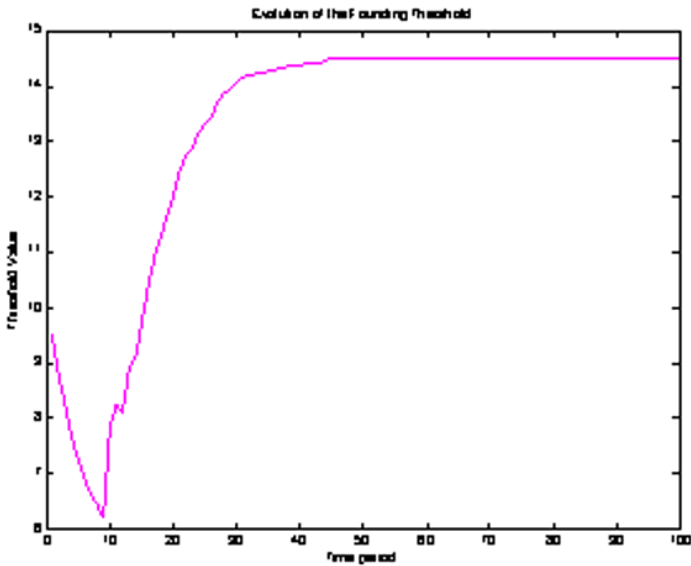


Fig. 7.2.D. Graphical Output 150% TEA Augmentation (threshold value).

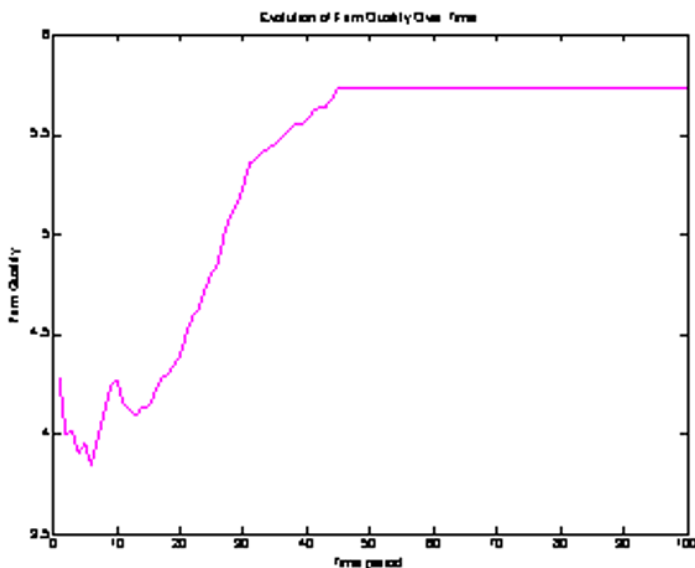


Fig. 7.2.E. Graphical Output 150% TEA Augmentation (quality).

Table 7.3 contains the numerical results associated with the augmented TEA simulation run as well as the baseline simulation results. These results show that total firm entry increased from 227 firms to 315 firms. Mean entry at each time step increased slightly as did the standard deviation. The total number of firm exits increased from 108 in the baseline case to 151 in the TEA augmented case. Total firm survival followed a similar pattern. Overall firm quality increased very slightly from 492.25 to 529.82. Mean firm quality also increased very slightly from 4.92 to 5.30. The standard deviation associated with firm quality was slightly larger in the TEA Augmentation case, suggesting slightly larger variability in overall firm quality.

Table 7.3 Baseline/150% TEA Augmentation.

Baseline Results				150% TEA Augmentation Results			
output	totals	mean	std	totals	mean	std	
firm entry	227	2.27	6.0767	315	3.15	7.0659	
firm exit	119	1.19	2.3855	151	1.51	2.9559	
firm survival	108	1.08	3.6912	164	1.64	4.11	
firm quality	492.2476	4.9225	0.5006	529.8243	5.2982	0.6459	

Figure 7.3 contains the graphical results associated with a 150% quality of human capital (QHC) augmented simulation run. Here again, one can see that this simulation followed the same general pattern of behavior as was evident in the other simulations. However, it is noteworthy to point out that the number of firm entrants per iteration was slightly larger than in the baseline simulation while the number of firm exits was slightly smaller per iteration. The evolution of the founding threshold followed the same pattern of dropping and then rising while the pattern associated with overall firm quality was slightly different. In this case, overall firm quality initially drops off and then rises and eventually levels off as net entry stabilizes around zero.

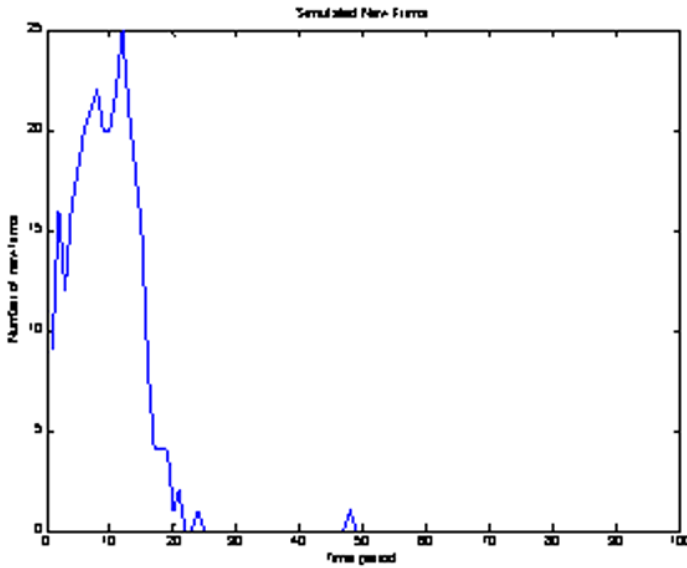


Fig. 7.3.A. Graphical Output 150% QHC Augmentation (new firms).

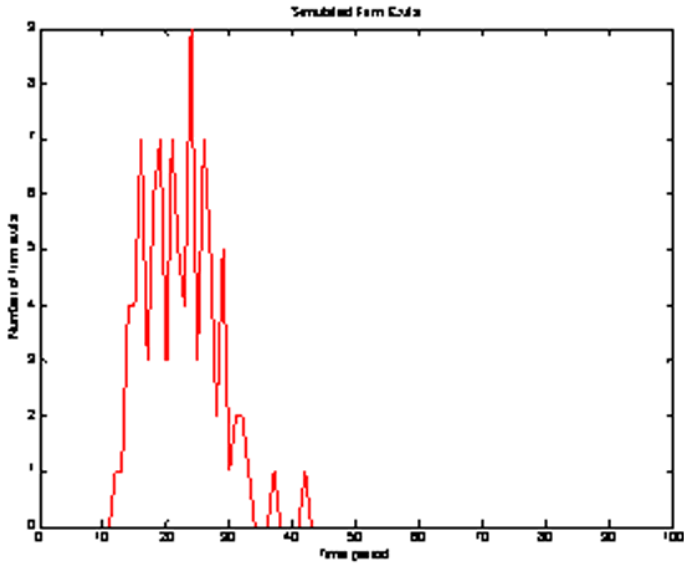


Fig. 7.3.B. Graphical Output 150% QHC Augmentation (firm exits).

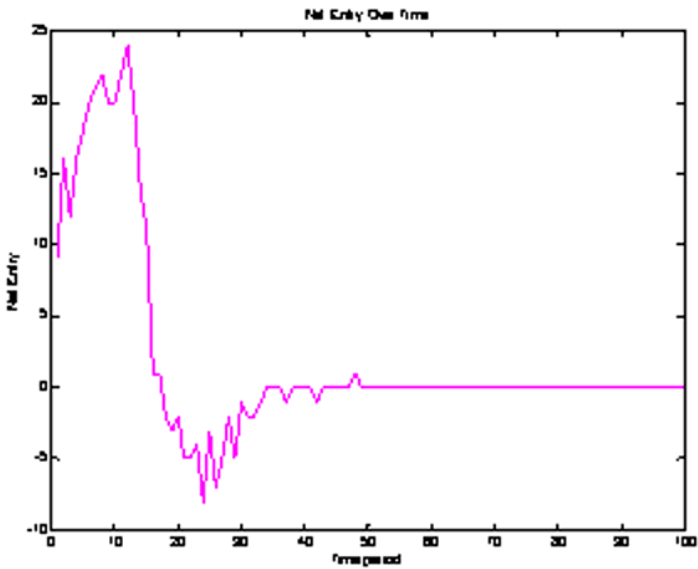


Fig. 7.3.C. Graphical Output 150% QHC Augmentation (new entry).

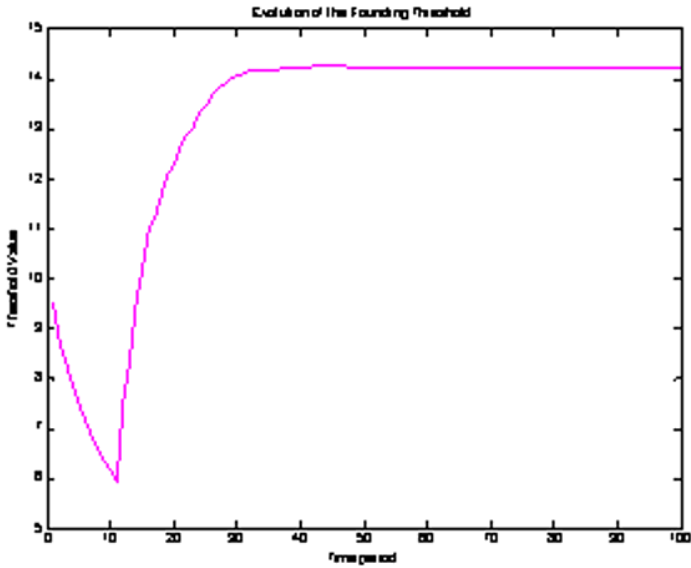


Fig. 7.3.D. Graphical Output 150% QHC Augmentation (threshold value).

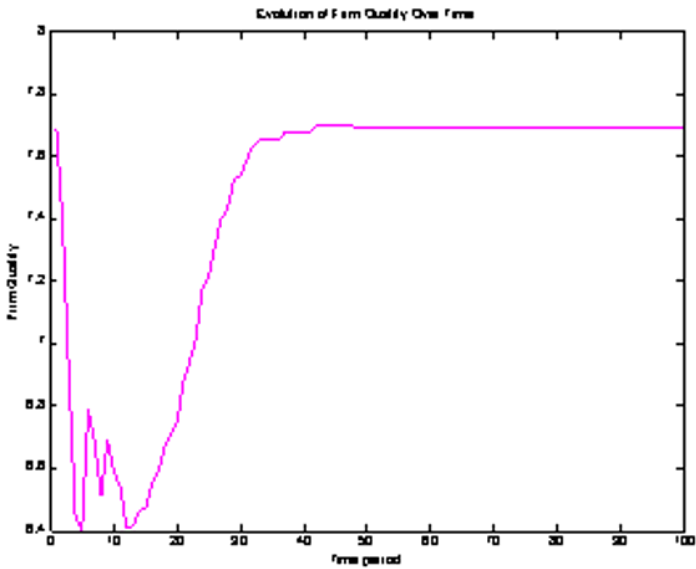


Fig. 7.3.E. Graphical Output 150% QHC Augmentation (quality).

Table 7.4 contains a numerical comparison of the baseline results to the 150% QHC augmented simulation run. The results contained in Table 7.4 show that the total number of firms in the QHC augmented run is slightly larger than in the baseline case, however, the total number of firm exits is slightly smaller. The means and standard deviations are quite similar. The total number of firm survivals is nearly double the baseline case in both the total number and mean number of survivals. The standard deviation associated with firm survival is, again, larger in the augmented case than in the baseline case. Overall and mean firm quality is substantially larger in the augmented case than in the baseline case.

Table 7.4. Baseline/150% QHC Augmentation.

Baseline Results				150% QHC Augmentation Results		
output	totals	mean	std	totals	mean	std
firm entry	227	2.27	6.0767	300	3	6.745
firm exit	119	1.19	2.3855	91	0.91	2.0055
firm survival	108	1.08	3.6912	209	2.09	4.7395
firm quality	492.2476	4.9225	0.5006	744.3092	7.4431	0.4359

Figure 7.4 contains the graphical output associated with a 150% augmentation in the availability of financial capital (AFC). Again, the general pattern of the behavior of the simulation is similar to that of the baseline simulation. However, one slight difference does exist. Exits in this set of simulation results continue to occur throughout the course of the simulation run. As a result, net firm entry fails to converge toward zero as rapidly as in the baseline case, yielding a pattern of evolution of overall firm quality that continues to rise as the 'less fit' firms continue to exit.

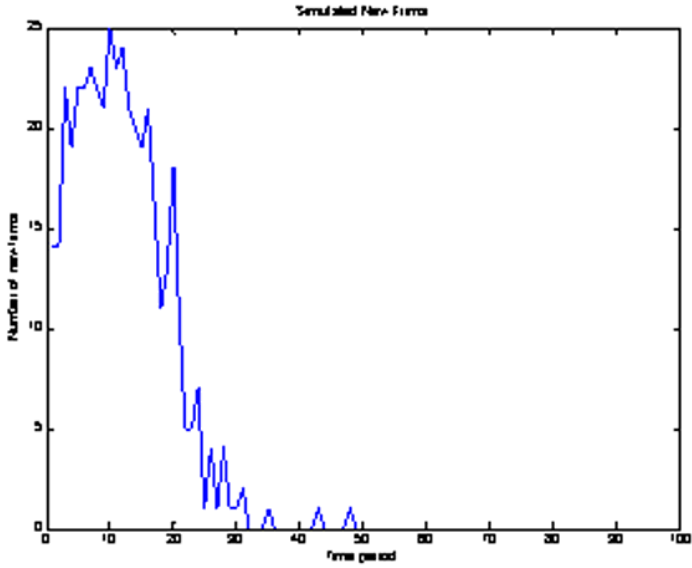


Fig. 7.4.A. Graphical Output from 150% AFC Augmentation (new firms).

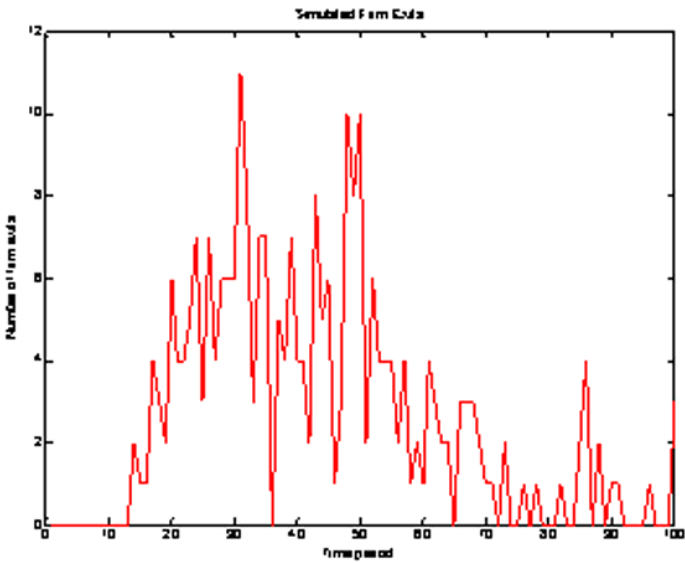


Fig. 7.4.B. Graphical Output from 150% AFC Augmentation (firm exits).

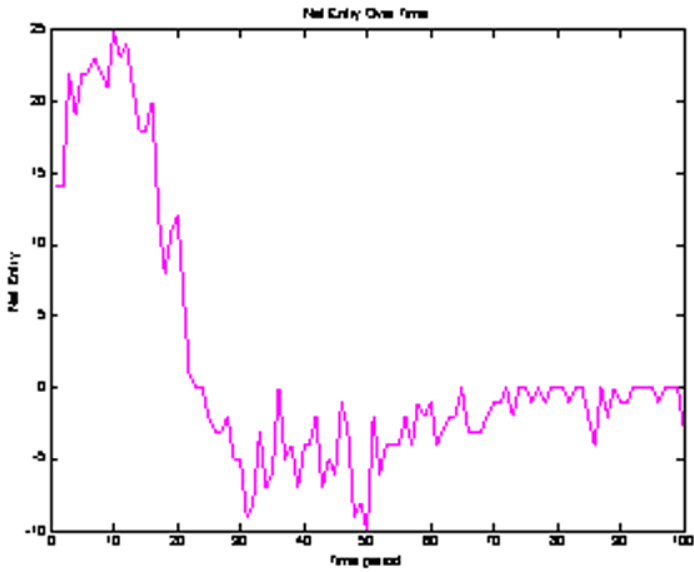


Fig. 7.4.C. Graphical Output from 150% AFC Augmentation (new entry).

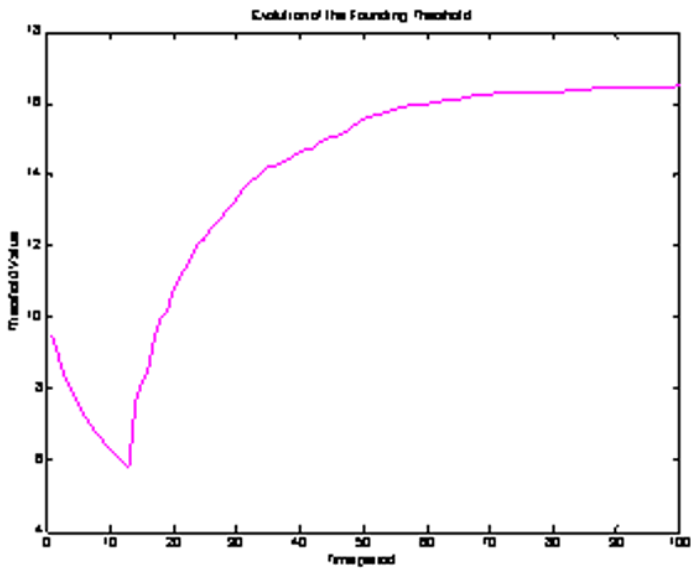


Fig. 7.4.D. Graphical Output from 150% AFC Augmentation (threshold value).

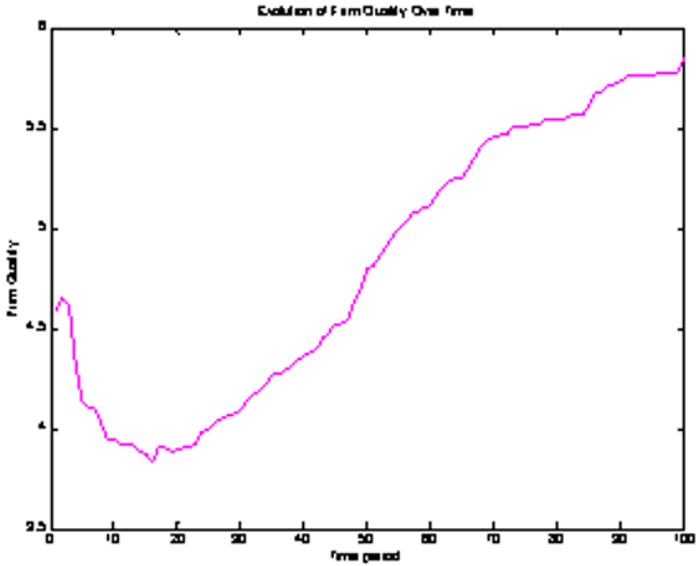


Fig. 7.4.E. Graphical Output from 150% AFC Augmentation (quality).

Table 7.5 contains a numerical comparison of the baseline simulation results and the 150% augmented AFC simulation results. The results contained in Table 7.5 show that the AFC augmentation yielded simulation results that showed a substantial increase in total and mean firm entry between the baseline and AFC augmented results. Total and mean firm exits and survivals were also substantially larger in the AFC augmented case than in the baseline case. Total and mean firm quality, however, was slightly larger in the baseline case than in the AFC augmented case.

Table 7.5. Baseline/150% AFC Augmentation.

Baseline Results				150% AFC Augmentation Results		
output	totals	mean	std	totals	mean	std
firm entry	227	2.27	6.0767	435	4.35	7.96
firm exit	119	1.19	2.3855	257	2.57	2.7312
firm survival	108	1.08	3.6912	178	1.78	5.2287
firm quality	492.2476	4.9225	0.5006	481.4701	4.8147	0.6894

Figure 7.5 contains the graphical output associated with the final simulation run. Once again, the general pattern of behavior is similar to that of the baseline case. However, one can see that firm entry was slightly

larger per iteration in this simulation than it was in the baseline simulation. The number of firm exits follows the pattern of the baseline case as does net entry and the evolution of the entry threshold. The evolution of firm quality follows a pattern similar to that demonstrated by the augmented QHC simulation run where firm quality initial drops off substantially as new firms enter, recovering only when many of these firms begin to exit.

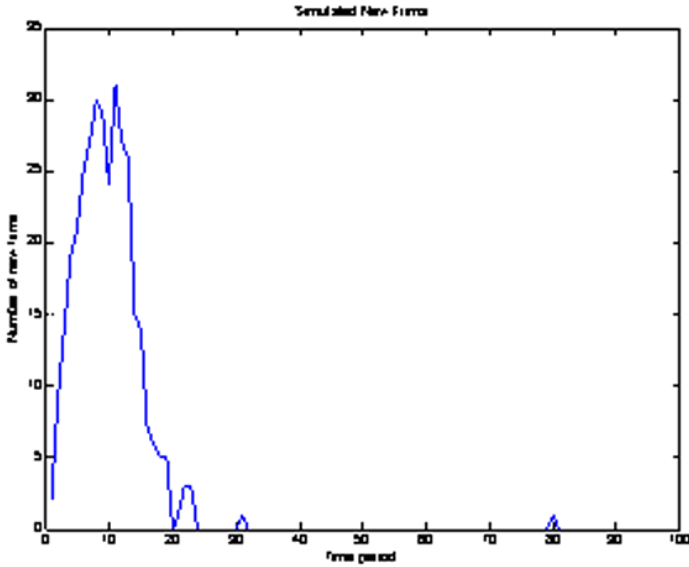


Fig. 7.5.A. Graphical Output from 150% NRI Augmentation (new firms).

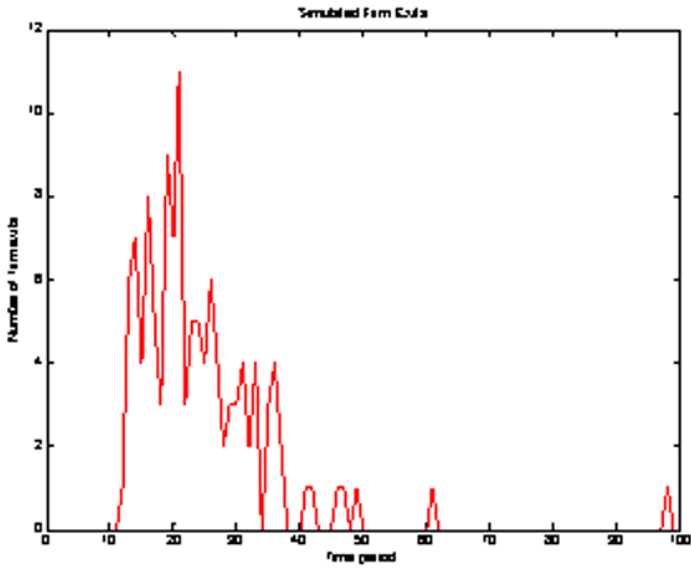


Fig. 7.5.B. Graphical Output from 150% NRI Augmentation (firm exits).

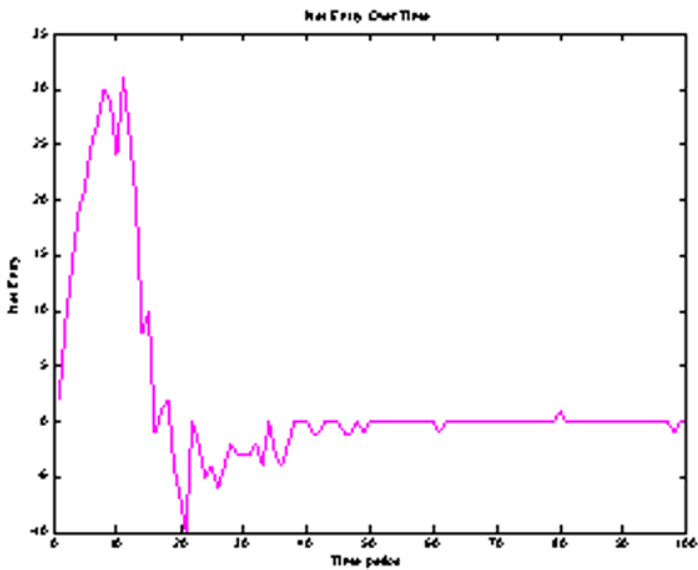


Fig. 7.5.C. Graphical Output from 150% NRI Augmentation (new entry).

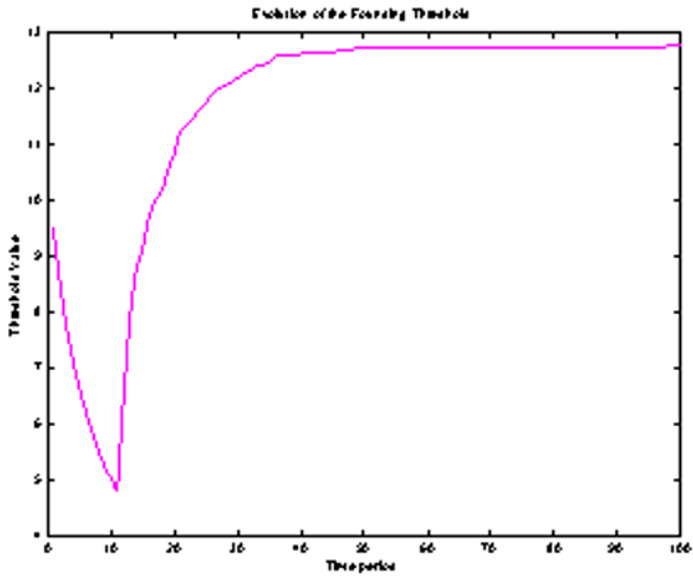


Fig. 7.5.D. Graphical Output from 150% NRI Augmentation (threshold value).

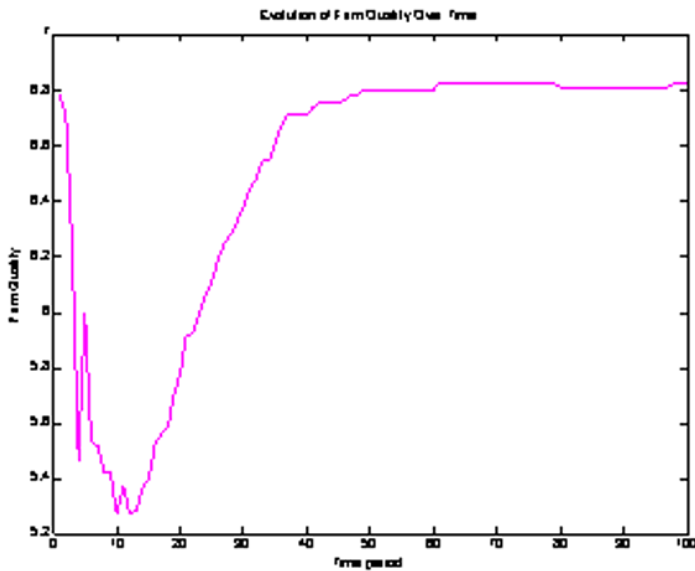


Fig. 7.5.E. Graphical Output from 150% NRI Augmentation (quality).

Table 7.6 contains the associated numerical comparison information. In this simulation run the value of λ in relation 2 was augmented by 150% over the baseline case. This augmentation had the effect of increasing the mean and variance of the Poisson distribution on which new business routines/innovations (NRI) were drawn by 150%. This created a situation where there was a higher probability of randomly drawing more and higher quality values of NRI to match to the firms in the model. Therefore, this set of simulation results provides evidence gauging the impact of the policy proposals in the “Roadmap” that affect the availability of new business routines/innovations.

Table 7.6. Baseline/150% NRI Augmentation.

Baseline Results		150% NRI Augmentation Results				
output	totals	mean	std	totals	mean	std
firm entry	227	2.27	6.0767	345	3.45	8.1071
firm exit	119	1.19	2.3855	122	1.22	2.2988
firm survival	108	1.08	3.6912	223	2.23	5.8083
firm quality	492.2476	4.9225	0.5006	649.2389	6.4924	0.5052

The results contained in Table 7.6 suggest that firm entry is substantially larger, in terms of totals, means, and standard deviations, in the NRI augmented case than in the baseline case. Firm exits are approximately equal in all three measures while firm survival is significantly larger in the NRI augmented case. Firm quality is considerably larger in both totals and means in the NRI augmented case than in the baseline case. The standard deviation associated with firm quality is approximately equal.

Overall, the total number of firm entries is larger in every augmented case when compared to the baseline case. Firm exits are larger than the baseline case in the TEA and AFC augmented simulations. Firm exits are smaller than the baseline case in the QHC augmented case and approximately equal in the NRI augmented case. The number of firm survivals is larger than the baseline case in every augmented simulation case; however, the total number of entries is also larger in the augmented cases. The most important indicators, the firm quality indicators, are larger in all of the augmented simulation runs except for the AFC simulation run. Firm quality is substantially larger in the QHC and NRI cases while it is only slightly larger in the TEA case.

Table 7.7 contains a t-statistic associated with a t-test comparing the differences in mean firm quality for each of the four augmented simulation runs to the baseline case. The results contained in Table 7.7 suggest that

only the QHC and NRI mean firm qualities are statistically significantly different from each other ($t\text{-stat} > +$ or $- 1.96$). Therefore, only in these two cases, can a difference in mean firm quality be confidently made.

Table 7.7. Statistical Test of Firm Quality Difference.

Simulation	Mean Firm Quality	Difference	t-statistic
Baseline	4.9225	0	0
TEA	5.2982	-0.3757	-0.65539
QHC	7.4431	-2.5206	-5.38302
AFC	4.8147	0.1078	0.181176
NRI	6.4924	-1.5699	-3.12169

7.6 Conclusions

To draw conclusions regarding the impact of the policy proposals contained in “A Roadmap for an Entrepreneurial Economy”, each specific categorizable policy proposal contained in the document was classified along one of four dimensions of effect. These four dimensions were then built into a simulation model that was used to analyze the relative impact of each dimension on entrepreneurial activities.

Each of the four categories led to an increase in the total and mean number of firm entries when compared to a baseline simulation results. However, the number of firm entries was only significantly larger in two of the four augmented cases, those being the QHC and NRI cases. The total and mean number of firm exits was larger in each of the four simulation runs when compared to the baseline case; however, this result is ambiguous because the total number of firm entries was also larger. The total and mean number of firm survivals was larger than the baseline simulation in every simulation run, suggesting that increases in all four dimensions of effect led to an increase in the total and mean number of firms.

If the goal of the policy proposals contained in the “Roadmap” was to increase the total number of firms in a given society, then each of the dimensions of effect would be influential in achieving this end. However, the stated goal contained in the “Roadmap” was to increase entrepreneurial activities in an effort to increase radical innovative activity and thus U.S. productivity. Therefore, the main measure of the simulation results to focus on should be total and average firm quality as productivity increases are reflected in this model by the quality of the firms. Higher firm quality renders higher productivity. Based on the simulation results, two of the

dimensions of effect, defined in this research, can confidently be associated with an increase in firm quality. These two categories are QHC and NRI. Therefore, the most important conclusion drawn from the results of this analysis are that those policies influencing the QHC and NRI dimensions would have the best chance of achieving the end stated in the “Roadmap”.

An interesting corollary of this conclusion is its similarity to the conclusions drawn by Paul Romer (1986 and 1990) and Robert Lucas (1988) regarding their work on New Growth Theory. While it is not the purpose of this paper to discuss New Growth Theory, it is worthy to note that New Growth Theory suggests that economic or productivity growth is brought about by increases in the creation of new knowledge. Both of the dimensions significantly affecting total and mean firm quality (QHC and NRI) are related to the components in the creation of new knowledge in the models of economic growth, based on New Growth Theory. Consequently, the results drawn from this simulation modeling effort seem to support the conclusions drawn from the models of economic growth based on New Growth Theory, where growth is a function of increases in the stock of new knowledge that results from the skill of the workforce or the quality of a societies’ human capital.

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8. Putting the Entrepreneur Back into Development and Foreign Policy

Nicola A. V. Virgill

8.1 Introduction

Reducing global poverty and underdevelopment has become increasingly more important for American development assistance and foreign policy for reasons that go beyond humanitarian grounds. A more vibrant global economy, inclusive of the world's most economically depressed regions, is important for the continued expansion of international trade, stemming the flow of illegal immigration and the fight against terrorism.¹ Therefore, policies which promote growth and development in developing countries are also important for America's entrepreneurial economy.

The search for policies to bring about both growth and development has been the focus of economic discovery since the very beginning of the science. While economic growth relates to the expansion of an economy based on its current structure, economic development implies "a process of structural transformations" leading to an overall higher growth trajectory². Over the last 60 years, developing countries have generally used two strategies in their pursuits of development. The first was import substitution – a process of industrialization by producing previously imported goods for the domestic market. By the 1980's, in the face of financial crisis, many developing countries then turned to the second strategy – export promotion. However, with the exception of some countries in East Asia, neither strategy has resulted in meaningful

¹ Jeffrey Sachs, *The End of Poverty : Economic Possibilities for Our Time* (New York: Penguin Press, 2005) p.215.

² Richard Brinkman, "Economic Growth Versus Economic Development: Towards a Conceptual Clarification," *Journal of Economic Issues* 29, no. 4 (1995): p.1183.

economic development. Both development approaches relied on strong state intervention and persistent market distortions to sustain their viability – thus often crowding out or thwarting altogether the traditional role of the entrepreneur.

This paper contends that the absence of the entrepreneur from development theory and strategy has led to the misguided and often failed development attempts by countries. The entrepreneur is at the core of development. Schumpeter (2002), for example, recognized that the entrepreneur was the “driving force” of creative change and innovation in an economy³ Baumol, Litan and Schramm (2006) argues that “Even in poor countries, facilitating entrepreneurship is a sound strategy—and arguably the best strategy—for accelerating economic growth.”⁴ While much of the more recent work on entrepreneurship focuses on developed countries and their transformation to entrepreneurial economies⁵, this paper recognizes that the entrepreneur and policies which encourage his existence in an economy are also important in the developing world.

Entrepreneurs exist in every society— even in “hostile” environments,⁶ albeit in differing concentrations and for various purposes⁷. However, developing countries face important challenges to entrepreneurship. This paper hypothesizes that countries which provide an unfavorable “institutional context for entrepreneurship to take place and to be socially

³ Joseph A Schumpeter, “The Economy as a Whole: Seventh Chapter of the Theory of Economic Development,” *Industry and Innovation* 9, no. 1/2 (2002): p.97, Joseph A. Schumpeter, “The Creative Response in Economic History,” *The Journal of Economic History* 7, no. 2 (1947): p.150.

⁴ William J. Baumol, Robert Litan, and Carl Schramm, “Unleashing Entrepreneurship in Less Developed Economies,” in *Good Capitalism Bad Capitalism* (New Haven: Yale University Press (mimeo), 2006), p.21.

⁵ David Audretsch and Roy Thurik, “A Model of the Entrepreneurial Economy,” *Discussion Papers on Entrepreneurship, Growth and Public Policy* (2004).

⁶ Bridget Butkevich and Virgil Storr, *How Entrepreneurs Respond in Hostile Climates* (2001 [cited September 15 2006]); available from <http://www.ihika.org/ki/docs/characters.doc>.

⁷ Zoltan Acs et al., “Global Entrepreneurship Monitor: 2004 Executive Report,” (2005). R Sternberg and S Wennekers, “Determinants and Effects of New Business Creation Using Global Entrepreneurship Monitor Data,” *Small Business Economics* 24, no. 3 (2005).

beneficial”⁸ will experience poorer economic performance measured by gross national income per capita. Indeed, there are important costs to erecting barriers to entrepreneurship. A key objective of US foreign policy, therefore, should be the promotion of effective business environments in which entrepreneurs can flourish and where economic growth and development can occur.

This paper proceeds as follows: In Section 2, two strands of literature are explored. First, the entrepreneur’s absence from much of the development literature, the main entrepreneurial archetypes, his opportunity discovery processes and the role of institutions will be explored and the *knowledge-opportunity matching process* developed. Second, the literature on import substitution and export promotion are examined. This paper argues that the policies which accompanied these development strategies created dense *barriers to entrepreneurial activity* and contributed to their failure in many countries. The paper’s research questions, hypotheses, data and methodology are described in Sections 8.3 and 8.4. Then in Section 8.5, using data from the World Bank’s 2005 Doing Business Index and Freedom House’s index on Civil Liberties, this paper explores how the institutional arrangements that constitute the *entrepreneurial barrier*⁹ affects economic growth. Finally, in Section 8.6, this paper offers recommendations for an entrepreneurial-based foreign policy for the United States. It is suggested that US development assistance to developing countries focus on reducing the entrepreneurial barriers and expanding the knowledge opportunity matching process.

⁸ Frederic Sautet, “The Role of Institutions in Entrepreneurship: Implications for Development Policy,” *Mercatus Policy Series Policy Primer 1* (2005): p.1.

⁹ Acs et al (2003) had previously coined the term “knowledge filter” to describe the conditions which prevent new knowledge in innovative industries from being turned into commercialized economic knowledge (new products) by an alert entrepreneur. This paper now introduces the concept of the “entrepreneurial barrier” – an extension of the “knowledge filter” model – to a developing country context. The entrepreneurial barrier consists of two elements: those institutions which affect the quality and supply of entrepreneurs in an economy and those institutions which impede his activity.

8.2 Literature Review

8.2.1 The Role of the Entrepreneur in Development

That the entrepreneur had been ignored in economic theory for decades is well known. Cole (1946) offers that despite Jean-Baptiste Say's analysis of the entrepreneur in the early 1800's, economists often overlooked the entrepreneur as a source of economic change¹⁰ and paid little attention to the essential characteristics of their economic period – the “disruptive, innovating energy” – which resulted from the activities of the entrepreneur.¹¹ Schumpeter (1947), also lamented that the entrepreneur was a “sadly neglected” actor in economic development theory despite his central role in market processes.¹² Soltow (1968) offers that although economic historians often told the tales of “businessmen and firms”, they failed to “define explicitly the role of the entrepreneur in economic change, although they appear to have implicitly assumed that he was an important agent.”¹³ Kirzner (1997) argues that neoclassical economics' focus on perfect information¹⁴, perfect competition¹⁵ and general equilibrium theories, which “[sought] to explain market phenomenon as if they were, at each and every instant, strictly equilibrium phenomena”, failed to explain “what happens in market economies.”¹⁶ For Kirzner (1997), “entrepreneurial activity [had] no place at all in neoclassical microeconomics”.¹⁷ Hayek (1945) also posited that perfect information

¹⁰ Arthur H. Cole, “An Approach to the Study of Entrepreneurship: A Tribute to Edwin F. Gay,” *The Journal of Economic History* 6, Supplemental (1946): p.3.

¹¹ *Ibid.*: pp.2-3.

¹² Schumpeter, “The Creative Response in Economic History,” p.149.

¹³ James H. Soltow, “The Entrepreneur in Economic History,” *The American Economic Review* 58, no. 2 (1968): p.84.

¹⁴ Israel M. Kirzner, “Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach,” *Journal of Economic Literature* 35, no. 1 (1997): p.62.

¹⁵ *Ibid.*: p.64.

¹⁶ *Ibid.*: p.61.

¹⁷ *Ibid.*: p.67.

was a fallacy¹⁸ and therefore meaningful economic theory needed to explain the “process by which knowledge is constantly communicated and acquired.”¹⁹ While Hayek (1945) does not specifically refer to the entrepreneur, his focus on the actions of individuals in the market is consistent with entrepreneurship theory.

Recognizing these deficiencies in neoclassical economics, Austrian economics offered alternative views on the functioning of the market and the role of the entrepreneur in economic growth²⁰. Kirzner (1997) states that,

From Mises the modern Austrians learned to see the market as an entrepreneurially driven process. From Hayek they learned to appreciate the role of knowledge and its enhancement through market interaction, for the equilibrative process.²¹

One of the earliest descriptions of the entrepreneur is by Jean-Baptiste Say. Koolman (1971), writing on the Say’s contribution to entrepreneurship theory, finds that Say’s entrepreneur performed a specific role in the economy by coordinating other factors of production (i.e. labor, capital etc) with his knowledge in order to “meet the demands of the final consumers”²². Say’s entrepreneur assumed risks²³ and employed judgment in his entrepreneurial activities²⁴. Finally, Koolman (1971) points to Say’s contribution to the concept of entrepreneurial profits which were comprised of wages for the entrepreneur’s labor, interest for the capital used and pure profit²⁵.

While Say’s entrepreneur emerged earlier, Schumpeter’s entrepreneur is perhaps better known. The Schumpeterian entrepreneur is characterized by

¹⁸ F. A. Hayek, “The Use of Knowledge in Society,” *The American Economic Review* 35, no. 4 (1945): p.527.

¹⁹ Ibid.: p.530.

²⁰ Kirzner, “Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach,” p.70.

²¹ Ibid.: p.67.

²² G. Koolman, “Say’s Conception of the Role of the Entrepreneur,” *Economica* 38, no. 151 (1971): p.272.

²³ Ibid.: p.273.

²⁴ Ibid.: p.275.

²⁵ Ibid.: p.278.

his creative and disruptive response to external shocks²⁶. Innovation, for Schumpeter, was central to entrepreneurial activity and included the discovery of new products, new processes and the discovery of new markets²⁷ in response to exogenous shocks of new information²⁸. However, as the potential gains of these discoveries, “[could not] be proved at the moment at which the action has to be taken”²⁹, the entrepreneur assumed the risks of his actions and received the “surplus gains”³⁰ or profits if he was correct. Schumpeter (2002) also recognized that development was a process of “disturbance” and change instigated by the entrepreneur.³¹

Juxtaposed against the disruptive nature of the Schumpeterian entrepreneur, was the Kirznerian entrepreneur³². A central feature of Kirzner’s (1997) entrepreneur was the he restored a market to equilibrium³³. Kirzner found that markets were often in disequilibrium due to previous errors made by entrepreneurs³⁴ and that this disequilibrium generated new “profit opportunities”³⁵. However, “alert, imaginative entrepreneurs”, imbued with superior knowledge, were able exploit these “profit opportunities” by recognizing or “discovering” these errors and by taking action to correct the market.³⁶ The market would also

²⁶ Schumpeter, “The Creative Response in Economic History,” p.150.

²⁷ Ibid.: p.153.

²⁸ S. Shane and J. Eckhardt, “The Individual-Opportunity Nexus,” in *Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction*, ed. Zoltan Acs and David Audretsch (Springer, 2005), p.171.

²⁹ Schumpeter, “The Creative Response in Economic History,” p.157.

³⁰ Ibid.: p.155.

³¹ Schumpeter, “The Economy as a Whole: Seventh Chapter of the Theory of Economic Development,” p.97.

³² For a synthesis of Kirznerian and Schumpeterian entrepreneurs see Israel M. Kirzner, “Creativity and/or Alertness: A Reconsideration of the Schumpeterian Entrepreneur,” *The Review of Austrian Economics* V11, no. 1 (1999).

³³ Kirzner, “Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach,” p.68.

³⁴ Ibid.: p.71.

³⁵ Ibid.

³⁶ Ibid.

be brought into equilibrium by new entrants who would drive down entrepreneurial profits³⁷.

How does the entrepreneur become alert to and discover profit opportunities? First, Hayek (1945) recognized that knowledge was “dispersed” throughout society³⁸, while also understanding the importance of the uniqueness of each individual’s stock of information³⁹. Hayek (1945) also found that the market, through its frequent *adjustments* in response to the “separate actions of different people”⁴⁰ and “the conditions of supply of various factors of production”, communicated new information through prices⁴¹. While Hayek suggests that this new information would be communicated to everyone⁴², and used correctly⁴³, the Kirznerian and Schumpeterian models demonstrate that mistakes and misallocations do occur and provide new opportunities for the entrepreneur. Therefore, it is only the alert entrepreneur, drawing on his unique knowledge set, who is able to use this new information in innovative ways. Hayek’s theory, therefore, emphasised a *knowledge-opportunity matching process* of entrepreneurial discovery. Knowledge accumulation, in a sense, expands the realm of ‘surprises’ that an alert entrepreneur is able to spot and act upon. Knowledge accumulation is thus an important limiting factor for entrepreneurship.

8.2.2 Entrepreneurship and Institutions

Economists have, for a while, acknowledged the importance of institutions for economic growth.⁴⁴ However, an economy’s institutions also affect the supply and actions of entrepreneurs and potential entrepreneurs. Leibenstein (1968) finds that the supply of “gap-filling” entrepreneurs is determined by the availability of individuals with the required skill-sets

³⁷ Ibid.: p.72.

³⁸ Hayek, “The Use of Knowledge in Society,” p.520.

³⁹ Ibid.: p.521.

⁴⁰ Ibid.: p.526.

⁴¹ Ibid.: p.526-30.

⁴² Ibid.: p.526.

⁴³ Ibid.: p.527.

⁴⁴ Douglass Cecil North, *Institutions, Institutional Change, and Economic Performance, The Political Economy of Institutions and Decisions* (Cambridge ; New York: Cambridge University Press, 1990).

and risk tolerance levels together with a country's socio-political institutions which affect an individual's freedom of action.⁴⁵ For Leibenstein (1968) then, entrepreneurial activity emerges from human capital investments in the presence of *entrepreneur-friendly institutional arrangements*. Baumol (1968), referring to the entrepreneur, offers that it is important to examine "what can be done to encourage his activity" and "the determinants of the payoff to his activity"⁴⁶. Again, this suggests that it is important to examine the institutional factors which affect the likelihood of the emergence of the entrepreneur. Cole (1946) emphasized the "favoring environment" for entrepreneurship which consisted of incentives and opportunities for profit.⁴⁷ For Cole, an appropriate environment provided adequate training for entrepreneurs to ensure the "growth in skill of making wise decisions relative to innovation, management, and the adjustment to external forces".⁴⁸

Some studies have made an explicit link between entrepreneurial activities and institutions. Like Baumol (1990), for example, Sautet (2005) and Coyne and Leeson (2004) find that institutions can encourage either "productive" or "unproductive" entrepreneurial activities⁴⁹. Additionally, Sautet (2005) concludes that institutions which direct economic actors to "socially productive activities" and encourage the discovery of profit opportunities will have a positive effect on a country's economic performance.⁵⁰ Boettke and Coyne (2003) go further and link entrepreneurial promoting institutions with economic growth. They find that it is "the adoption of certain institutions, which in turn channel and encourage the entrepreneurial aspect of human action in a direction that in

⁴⁵ Harvey Leibenstein, "Entrepreneurship and Development," *The American Economic Review* 58, no. 2 (1968): pp.78-79.

⁴⁶ William J. Baumol, "Entrepreneurship in Economic Theory," *The American Economic Review* 58, no. 2 (1968): p.70.

⁴⁷ Cole, "An Approach to the Study of Entrepreneurship: A Tribute to Edwin F. Gay," pp.10-11.

⁴⁸ Ibid.

⁴⁹ W.J. Baumol, "Entrepreneurship: Productive, Unproductive, and Destructive," *Journal of Political Economy* 98, no. 5 (1990), Sautet, "The Role of Institutions in Entrepreneurship: Implications for Development Policy," p.8. and Christopher J. Coyne and Peter T. Leeson, "The Plight of Underdeveloped Countries," *Cato Journal* 24, no. 3 (2004).

⁵⁰ Sautet, "The Role of Institutions in Entrepreneurship: Implications for Development Policy," p.9.

turn spurs economic growth.”⁵¹ Institutions, therefore, play a role in guiding entrepreneurial activities.

Factors which affect the quality of entrepreneurs in developing countries are also important. Wennekers et al (2005) in their study of the effects of business startups and the stages of economic development find that investments in management skills, institutional development and policies which assist “the growth of young businesses” should be emphasized as a part of an overall entrepreneurship policy for developing countries.⁵² Schultz (1980), writing on entrepreneurship in the agricultural sector, finds that there is substantial value to devoting resources to improving “entrepreneurial ability” through both formal education and other informal learning experiences.⁵³ Kilby (1961, 1962 and 2003) offers that there is a scarcity of entrepreneurial and managerial skill in many developing countries led to low levels of business start-ups and poor business performance.⁵⁴ Stel et al (2005) explain that ‘low human capital’ and a lack of training opportunities may explain their surprising finding that entrepreneurial activity is negatively related to economic performance in developing and poor countries.⁵⁵ Therefore, in addition to creating the right institutional context, potential entrepreneurs must also be supported by the right skills and training.

⁵¹ Peter J. Boettke and Christopher J. Coyne, “Entrepreneurship and Development: Cause of Consequence?,” *Mercatus Center Global Prosperity Initiative* (2003): p.3.

⁵² Sander Wennekers et al., “Nascent Entrepreneurship and the Level of Economic Development,” *Small Business Economics* 24 (2005): p.306. See also Sternberg and Wennekers, “Determinants and Effects of New Business Creation Using Global Entrepreneurship Monitor Data,” p.199.

⁵³ Theodore W. Schultz, “Investment in Entrepreneurial Ability,” *The Scandinavian Journal of Economics* 82, no. 4 (1980): pp.444-48.

⁵⁴ P Kilby, “African Labour Productivity Reconsidered,” *The Economic Journal* 71, no. 282 (1961), P Kilby, “Organization and Productivity in Backward Economies,” *The Quarterly Journal of Economics* 76, no. 2 (1962), Peter Kilby, “The Heffalump Revisited,” *Journal of International Entrepreneurship* 1 (2003).

⁵⁵ A Stel, M Carree, and R Thurik, “The Effect of Entrepreneurial Activity on National Economic Growth,” *Small Business Economics* 24, no. 3 (2005): p.319.

8.2.3 Import Substitution and Export Promotion: Creating the Entrepreneurial Barrier

Every first year student of economics learns that the “invisible hand”⁵⁶ of the market decides what, how and for whom to produce. This paper’s discussion of entrepreneurship reveals that the market also provides a space for entrepreneurs to carry out their activities. While no country operates with perfectly free markets, some types of economic spaces appear to be more conducive to encouraging socially productive entrepreneurship than others⁵⁷ and others have created barriers to this activity. Tybout (2000), for example, finds that,

Because of institutional entry barriers, labor market regulations, poorly functioning financial markets and limited domestic demand, the industrial sectors of developing countries are often described as insulated, inefficient oligopolies.⁵⁸

Boettke and Coyne (2003) point to property rights, economic freedom and policy and political stability as important factors which can affect entrepreneurship.⁵⁹ Klapper, Laeven and Rajan (2004) show that a country’s level of financial development, its labor market regulations and its level of taxes may also serve as barriers to entrepreneurial activities.⁶⁰ A review of the data in the World Bank’s 2000 World Business Environment Survey (WBES)⁶¹, a survey of 10,032 entrepreneurs and managers in 80 countries on the business environments in which they operated, also sheds some light on

⁵⁶ Adam Smith, *The Wealth of Nations* (1776).

⁵⁷ See Boettke and Coyne, “Entrepreneurship and Development: Cause of Consequence?.” See also Coyne and Leeson, “The Plight of Underdeveloped Countries.”

⁵⁸ J.R. Tybout, “Manufacturing Firms in Developing Countries: How Well Do They Do, and Why?,” *Journal of Economic Literature* 38, no. 1 (2000): p.30.

⁵⁹ Boettke and Coyne, “Entrepreneurship and Development: Cause of Consequence?,” p.22.

⁶⁰ L Klapper, L Laeven, and R Rajan, “Barriers to Entrepreneurship,” *NBER Working Paper No 10380* (2004): pp.27-33.

⁶¹ World Bank, *World Business Environment Survey* (2000 [cited 2 October 2006]); available from <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/0,,menuPK:476823~pagePK:64165236~piPK:64165141~theSitePK:469372,00.html>.

the types of barriers faced by entrepreneurs in developing regions compared to those in the OECD. Respondents were asked to rate a number of variables related to general obstacles to doing business in their countries (i.e. business regulations, corruption levels, customs regulations, environmental regulations, the exchange rate, financial availability, foreign exchange regulations, high taxes, inflation, infrastructure, labor regulations and tax and Regulations). These variables were measured on a scale of 1 to 4, with a low score representing no obstacle to business activities and a high score indicating that the variable was a major obstacle. An analysis of the WBES results reveals that the obstacles related to corruption, customs regulations, exchange rate regulations, access to financing, foreign exchange regulations, inflation and having adequate infrastructure were higher in developing regions when compared to firms operating in the developed OECD region (See Figure 8.1). Interestingly, many of these variables identified by entrepreneurs in developing countries could affect their ability to engage in international trade – an important factor for a country’s development⁶². Indeed, these obstacles would impact import and export activities.

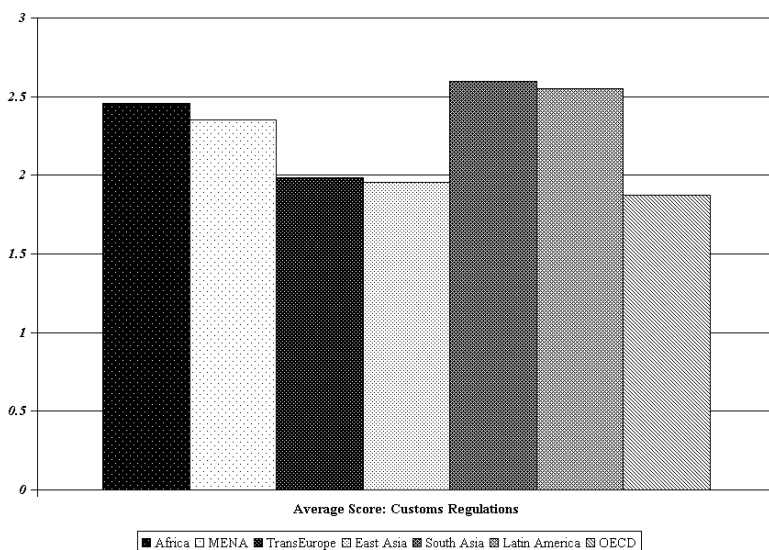


Fig. 8.1.a. Average Scores on the Obstacles to Doing Business Index which were Higher in Developing Regions⁶³ when Compared to the OECD Region: Customs Regulations.

⁶² See Anne O. Krueger, “Trade Policy as an Input to Development,” *The American Economic Review* 70, no. 2 (1980).

⁶³ Developing Regions included Africa, the Middle East and North Africa (MENA), Transitioning Europe, East Asia, South Asia and Latin America.

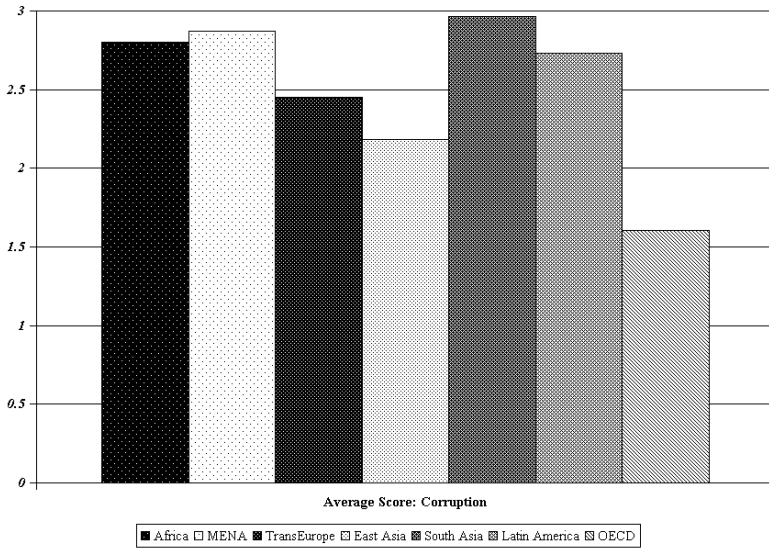


Fig. 8.1.b. Average Scores on the Obstacles to Doing Business Index which were Higher in Developing Regions when Compared to the OECD Region: Corruption.

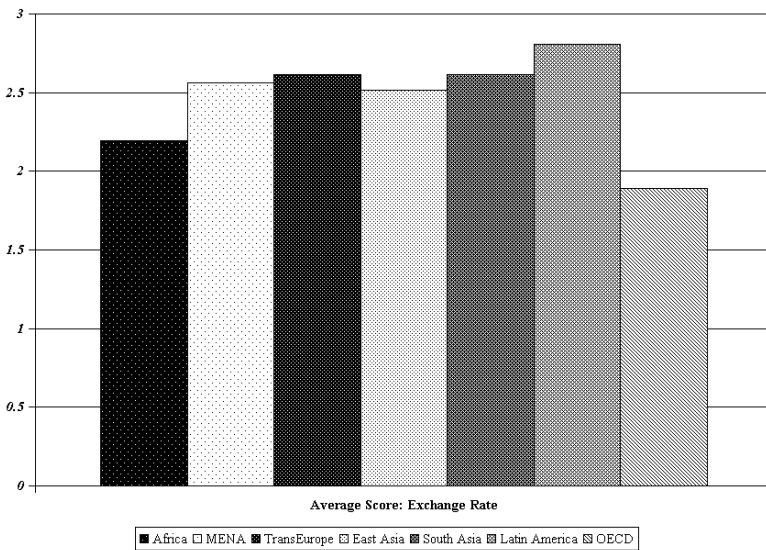


Fig. 8.1.c. Average Scores on the Obstacles to Doing Business Index which were Higher in Developing Regions when Compared to the OECD Region: Exchange Rates.

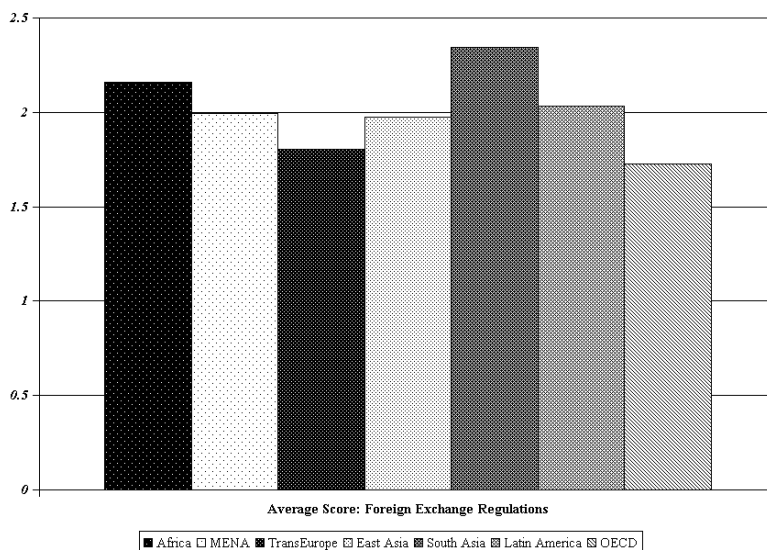


Fig. 8.1.d. Average Scores on the Obstacles to Doing Business Index which were Higher in Developing Regions when Compared to the OECD Region: Foreign Exchange Regulations.

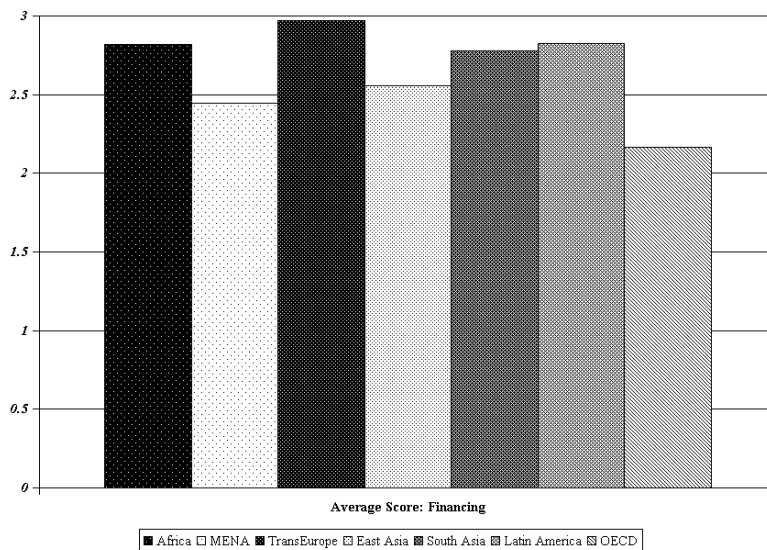


Fig. 8.1.e. Average Scores on the Obstacles to Doing Business Index which were Higher in Developing Regions when Compared to the OECD Region: Financing.

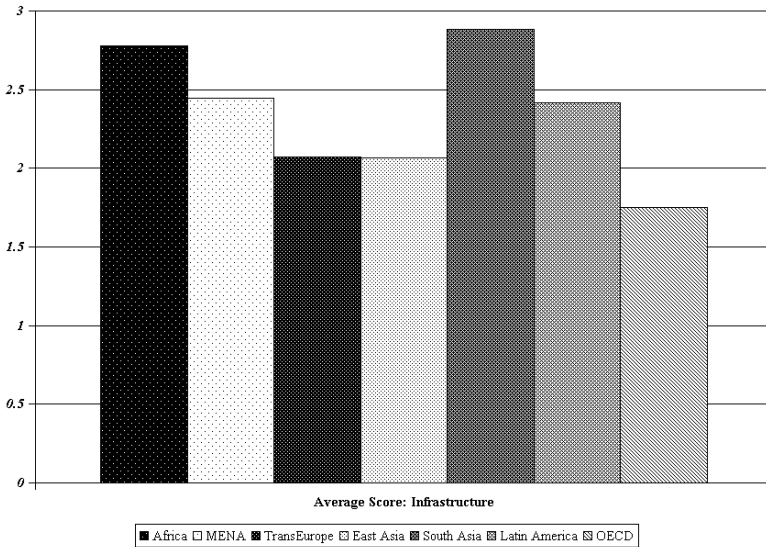


Fig. 8.1.f. Average Scores on the Obstacles to Doing Business Index which were Higher in Developing Regions when Compared to the OECD Region: Infrastructure.

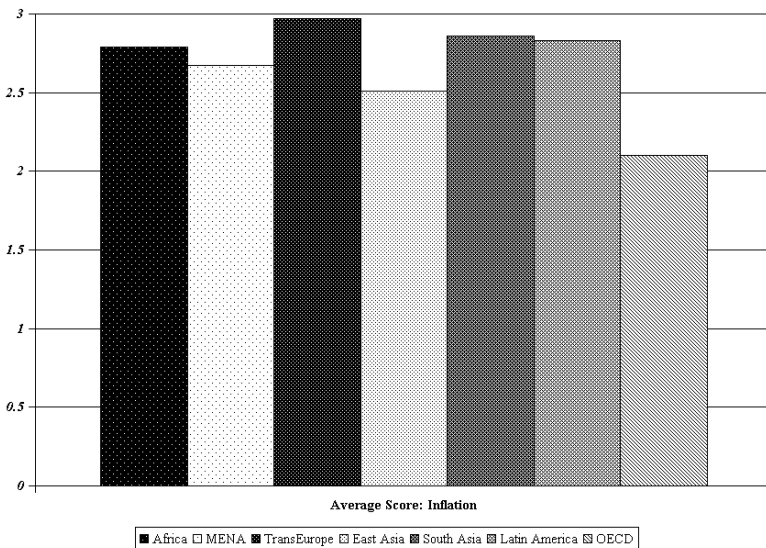


Fig. 8.1.g. Average Scores on the Obstacles to Doing Business Index which were Higher in Developing Regions when Compared to the OECD Region: Inflation.

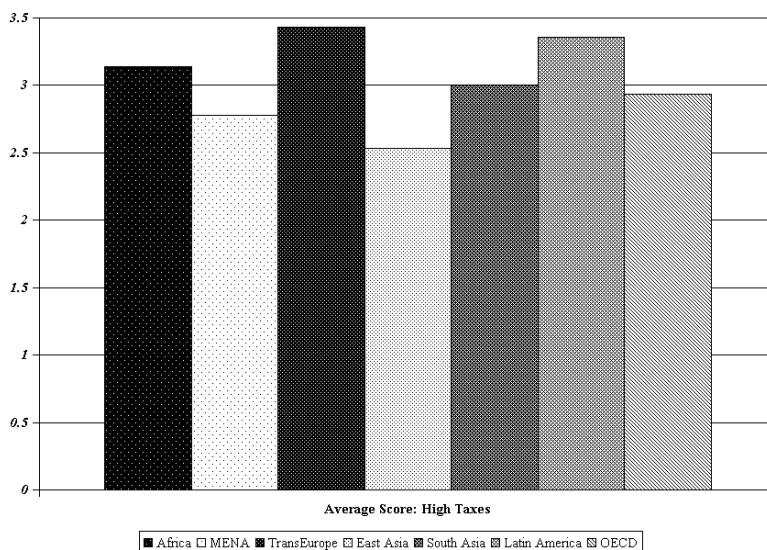


Fig. 8.1.h. Average Scores on the Obstacles to Doing Business Index which were Higher in Developing Regions when Compared to the OECD Region: High Taxes.

Surprisingly, the level of perceived obstacles faced by entrepreneurs from business, labor and tax regulations were lower for many developing regions when compared to OECD countries (see Figure 8.2). This result can be explained by Klapper, Laeven and Rajan's (2003) finding that,

Entry barriers are effective in retarding entry only in the least corrupt countries...this suggests that bureaucratic entry barriers in corrupt countries may be ineffective roadblocks, meant solely for extracting bribes.⁶⁴

Nevertheless, the barriers related to business, labor and tax regulations are still important as they may reinforce corruption as entrepreneurs circumvent them by engaging in additional corrupt practices with government officials. Finally, with the exception of South Asia, environmental regulations posed lower obstacles for developing country firms compared to firms in OECD countries. This finding perhaps reflects less well developed environmental regulations in developing countries.

⁶⁴ Klapper, Laeven, and Rajan, "Barriers to Entrepreneurship," p.5.

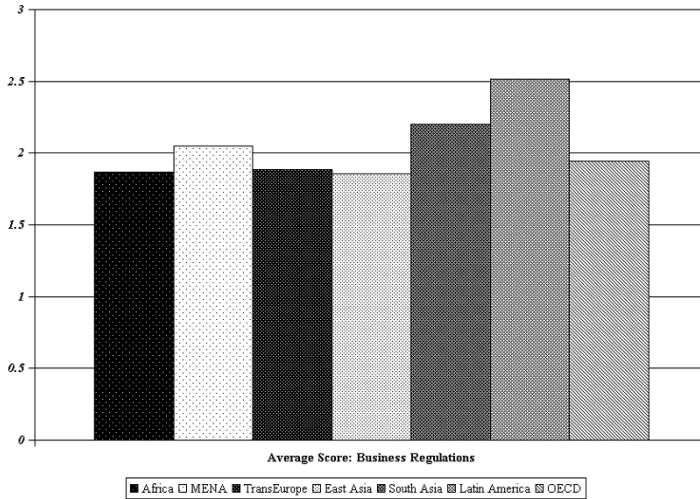


Fig. 8.2.a. Average Scores on the Obstacles to Doing Business Index which were generally lower in Developing Regions⁶⁵ when compared to the OECD Region: Business Regulations.

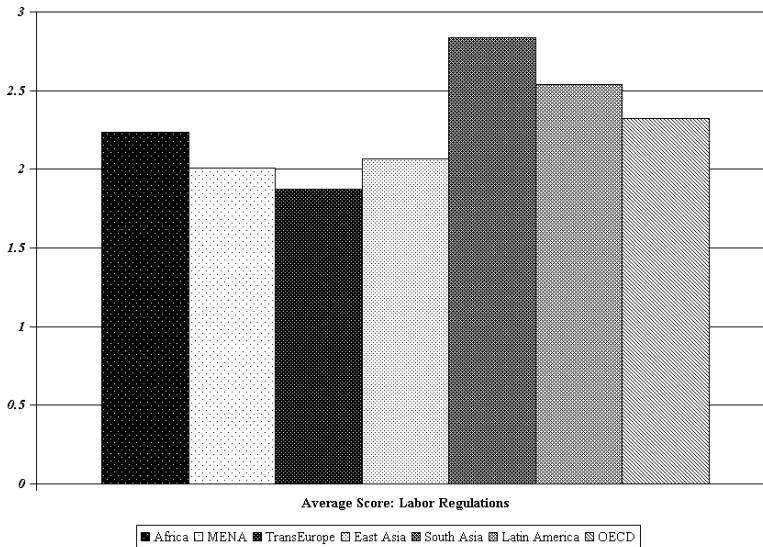


Fig. 8.2.b. Average Scores on the Obstacles to Doing Business Index which were generally lower in Developing Regions when compared to the OECD Region: Labor Regulations.

⁶⁵ Developing Regions included Africa, the Middle East and North Africa (MENA), Transitioning Europe, East Asia, South Asia and Latin America.

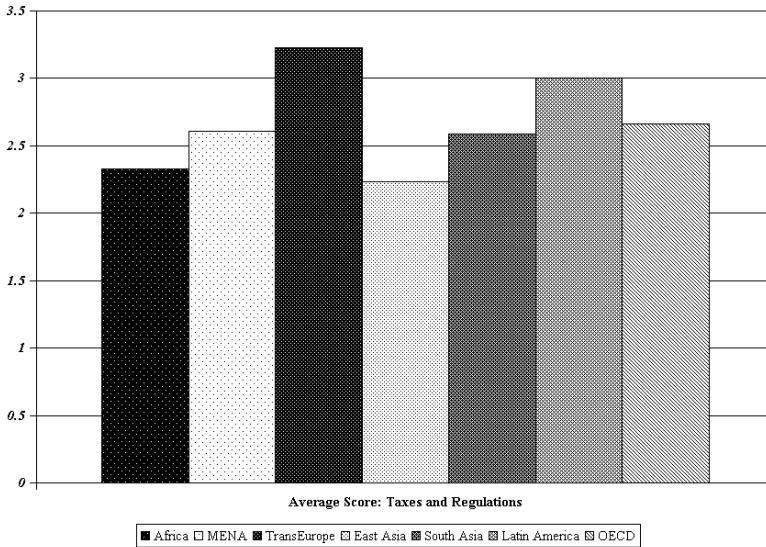


Fig. 8.2.c. Average Scores on the Obstacles to Doing Business Index which where generally lower in Developing Regions when compared to the OECD Region: Taxes and Regulations.

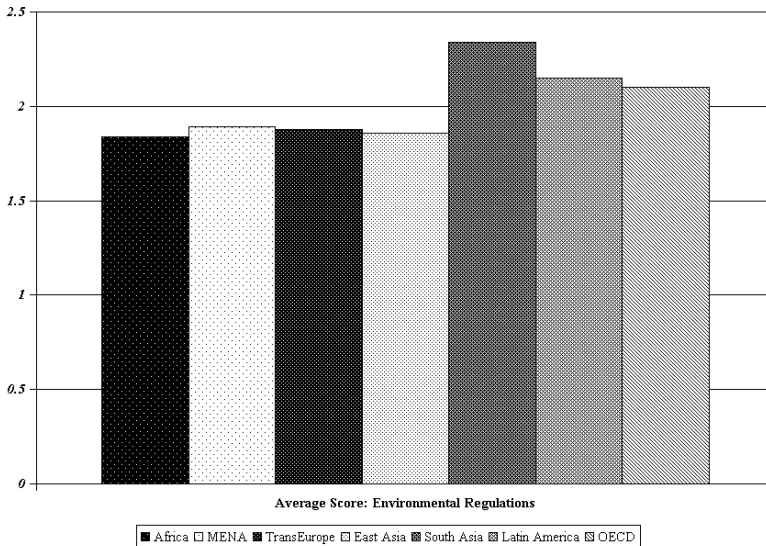


Fig. 8.2.d. Average Scores on the Obstacles to Doing Business Index which where generally lower in Developing Regions when compared to the OECD Region: Environmental Regulations.

Having identified some of the important barriers to entrepreneurship, it is important to discover how these came about. A review of the economic

spaces created in Africa, Asia, Latin America and developing Europe⁶⁶ reveals surprisingly similar trends which could explain the existence or absence of entrepreneurship and an entrepreneurship barrier. Many of the countries in these regions employed either import substitution or enclave forms of export promotion in their attempts to industrialize and achieve economic growth and development over the past 60 years. This section, then, examines the suitability of the economic spaces created by these development strategies for entrepreneurs and how this may have ultimately impacted economic performance.

A country's development policy does not emerge in a vacuum. Krugman (1995) pointed out that the 'conventional wisdom on economic development' changed considerably over the years⁶⁷. Early development policy focused on attracting foreign investment and was characterized by an emphasis on free and open markets and "stable currencies" backed by gold⁶⁸. Then, in response to the tumultuous and disruptive economic conditions of the Great Depression and the two World Wars, countries began to place more restrictions on their economies⁶⁹. As countries attempted to industrialize in order to absorb the surplus labor from their agriculture sectors⁷⁰, they found that the "import restrictions, imposed at first largely for balance of payments reasons, soon became valued as a way to promote industrialization"⁷¹. Bruton (1998) sums up nicely the motivation for import substitution. He states that,

To industrialize, given the existence of already industrialized and highly productive economies (the North), the countries of the South must protect their economies from imports from the North and concentrate

⁶⁶ Developing Europe includes Central and Eastern Europe. See Ivan T. Berend, "The Failure of Economic Nationalism: Central and Eastern Europe before World War I.I.," *Revue Economique* 51, no. 2 (2000).

⁶⁷ Paul Krugman, "Cycles of Conventional Wisdom on Economic Development," *International Affairs* 71, no. 4 (1995).

⁶⁸ *Ibid.*: pp.725-26.

⁶⁹ *Ibid.*: p.726.

⁷⁰ Raul Prebisch, "Commercial Policy in the Underdeveloped Countries," *The American Economic Review* 49, no. 2 (1959): p.252.

⁷¹ Krugman, "Cycles of Conventional Wisdom on Economic Development," p.726.

on putting in place new activities that will produce an array of manufactured products currently imported.⁷²

Additionally, the prevailing development theories supported import substitution. For example, Prebisch (1959) provided a model which justified the use of import substitution as an industrialization strategy in order to meet domestic demand for industrial goods⁷³. While countries could have chosen to increase exports to produce the foreign currency to import these industrial goods, Singer (1999) offers that industrializing developing countries “would find it initially easier to produce for an existing and known domestic market than for an unknown global market.”⁷⁴ Krugman (1995) explained that, “almost all serious people endorsed the idea of development through import-substituting industrialization, so of course it had to be right.”⁷⁵

An analysis of the experiences of countries which pursued import substitution strategies reveals the absence of a space for the entrepreneur. First, this paper examines how the questions of *what to produce and for whom* were answered. In market economies, these decisions are left largely to enterprises and entrepreneurs who are guided by prices and profits. However, for countries pursuing import substitution, there was strong government intervention and direction. When Zambia, for example, pursued import substitution in the 1960's, the new import-substituting domestic manufacturing sector produced mainly luxury goods, reflecting the previous import demand mix of the country's elites rather than the products required by the majority of citizens⁷⁶. Seidman (1974) provides the example of an ill-fated joint venture between the Zambian Government and the automaker Fiat, where the contracted annual production of automobiles was almost as great as the total number of vehicles in Zambia

⁷² Henry J. Bruton, “A Reconsideration of Import Substitution,” *Journal of Economic Literature* 36, no. 2 (1998): p.904.

⁷³ Prebisch, “Commercial Policy in the Underdeveloped Countries,” p.253. Singer (1999), however, clarifies that the original Prebisch-Singer thesis, which advocated the transition from agriculture to industry did not stipulate whether production should be focused on import substitutes or exports.

⁷⁴ Hans Singer, “Beyond Terms of Trade-Convergence and Divergence,” *Journal of International Development* 11, no. 6 (1999): p.911.

⁷⁵ Krugman, “Cycles of Conventional Wisdom on Economic Development,” p.729.

⁷⁶ Ann Seidman, “The Distorted Growth of Import-Substitution Industry: The Zambian Case,” *The Journal of Modern African Studies* 12, no. 4 (1974): p.606.

at the time.⁷⁷ In Latin America also, Baer (1972) finds that production was skewed by the “demand profile” of the wealthy and that the product mix was generally “too wide a spectrum, given limited capital and human resources and very narrow markets.”⁷⁸ As Baumol, Litan and Schramm (2006) points out,

Governments that guide their economies and attempt to pick “winners” (firms or industries) in the process often get it wrong...the firms in the industries chosen by governments practicing state guidance may prove unable to turn their state-advantage into commercial success because their activities are constrained by bureaucrats with little market experience.⁷⁹

Second, the *guiding forces* for production were quite different. While distortions are a by-product of errors in market economies and provide opportunities for correction by entrepreneurs, import substitution required long-lasting distortions. Prebisch (1959), for example, argued that tariffs and other types of government interventions were needed to redirect production into import competing industries and to protect domestic manufacturing.⁸⁰ Returning to the Zambian Fiat example, high tariff protections were necessary to sustain the venture’s profitability.⁸¹ However, Steel (1972), referring to Ghana, found that protective policies were ineffective, as the tariff structure distorted price signals and actually provided incentives for firms to produce the high-priced consumption goods, rather than desired capital goods.⁸² Steel (1972) adds that,

Distortions introduced or maintained by the structure of protection and other policies...make prices poor indicators

⁷⁷ Ibid.: p.607.

⁷⁸ Werner Baer, “Import Substitution and Industrialization in Latin America: Experiences and Interpretations,” *Latin American Research Review* 7, no. 1 (1972): p.108.

⁷⁹ Baumol, Litan, and Schramm, “Unleashing Entrepreneurship in Less Developed Economies,” p.24.

⁸⁰ Prebisch, “Commercial Policy in the Underdeveloped Countries,” p.256.

⁸¹ Seidman, “The Distorted Growth of Import-Substitution Industry: The Zambian Case,” p.608.

⁸² William F. Steel, “Import Substitution and Excess Capacity in Ghana,” *Oxford Economic Papers* 24, no. 2 (1972): pp.220-21.

of opportunity costs, and high effective protection creates profit opportunities in final-stage industries regardless of their social productivity.⁸³

Import substituting countries also maintained “overvalued exchange rates” to ensure the affordability of their industries’ imported capital inputs.⁸⁴ Prebisch (1959), referring to Latin America, found that as countries switched to the importation of capital goods, import demand actually became more inelastic as the importation of capital goods was not a choice, but a necessity.⁸⁵ Krueger (1980) adds that import substitution policies also negatively affected the country’s exports, “especially when they include[d] overvalued exchange rates and quantitative restrictions on imports” – further reducing foreign exchange earnings.⁸⁶ This paper offers that given these severe market distortions, it would have been difficult for the entrepreneur to discover or act on socially optimal opportunities.

Finally, the enormous bureaucracy which had to be constructed to support import substitution lent itself to the perpetuation of *permanent inefficiencies* in industry and corruption in government – both important barriers to productive entrepreneurship. Baer (1972) found that government policies which actively encouraged new entry often led to markets with many small and inefficient firms⁸⁷ On the other hand, many firms were operating with excess capacity, high labor costs relative to productivity and foreign exchange shortages which impacted their ability to obtain necessary inputs – resulting in further slack.⁸⁸ Bruton (1998) finds that the import licensing processes also created crippling mismatches between the time that capital investments were actually required and the times that import licences were obtained – again resulting in underutilization.⁸⁹ In the case of Ghana, the shortages of foreign exchange also led to an adverse selection process for suppliers as “the policy of seeking supplier finance for investment projects weakened the ability of

⁸³ Ibid.

⁸⁴ Bruton, “A Reconsideration of Import Substitution,” p.908.

⁸⁵ Prebisch, “Commercial Policy in the Underdeveloped Countries,” p.268.

⁸⁶ Krueger, “Trade Policy as an Input to Development,” p.289.

⁸⁷ Baer, “Import Substitution and Industrialization in Latin America: Experiences and Interpretations,” p.103.

⁸⁸ Bruton, “A Reconsideration of Import Substitution.”

⁸⁹ Ibid.: p.914.

the Government to determine the type and pattern of investments.”⁹⁰ Additionally, Steel (1972) points out that because of the Ghanaian government’s outright or joint ownership of many of these firms and the high unemployment rates, factories continued to operate even when they were inefficient.⁹¹ Krueger (1998) points out that import substitution,

Result[ed] in a dilemma: either the number of firms producing a given good must be very small, or the size of individual plants may well be below minimum efficient size. If the number of firms is very small, the absence of competition results in low-quality high-cost production....⁹²

The complex bureaucracy also supported corruption. For example, the import licensing process facilitated dishonest business dealings as “licence allocation decisions came to be dominated more by corruption and personal favour than by evaluation of economic viability.”⁹³ Krueger (1993) offers that complex bureaucratic systems which were created encouraged, ““expeditors” whose incomes were derived from facilitating the process of approvals and paperwork.”⁹⁴ Additionally, the supplier credit approval process, opened new avenues for corruption.⁹⁵ Haggard et al (1991), referring to a 1962 US Government Accounting Office report on South Korea, found that the import licensing system used during the country’s import-substitution program, “led to collusion between supplier and importer, shipment of defective merchandise, kickbacks, and overpricing.”⁹⁶ This paper, therefore, offers that given the inefficiency of the import substitution strategy and the complexity of the bureaucracy created by import substitution, entrepreneurs would be more likely to

⁹⁰ Steel, “Import Substitution and Excess Capacity in Ghana,” p.218.

⁹¹ Ibid.: p.228.

⁹² Anne O. Krueger, “Why Trade Liberalization Is Good for Growth,” *The Economic Journal* 108, no. 450 (1998): p.1515.

⁹³ Steel, “Import Substitution and Excess Capacity in Ghana,” p.222.

⁹⁴ Anne O. Krueger, “Virtuous and Vicious Circles in Economic Development,” *The American Economic Review* 83, no. 2 (1993): p.353.

⁹⁵ Steel, “Import Substitution and Excess Capacity in Ghana,” p.218.

⁹⁶ Stephan Haggard, Byung-kook Kim, and Chun-in Moon, “The Transition to Export-Led Growth in South Korea: 1954-1966,” *The Journal of Asian Studies* 50, no. 4 (1991): p.854.

engage in rent-seeking, evasive and “unproductive” entrepreneurial activities rather than in socially “productive”⁹⁷ entrepreneurship.

By the 1980’s, with the development failures of import-substituting countries evident, and with the apparent success of the outward-oriented, fast growing Asian countries, economic development’s ‘conventional wisdom’ changed⁹⁸. Countries were now advised to pursue export promotion strategies in order to achieve rapid growth and development.⁹⁹ As Krueger (1980) points out, export promotion strategies were supposed to create less distortionary markets as,

An international market [was] in the background: it functions as a constraint upon economic behaviour, both of entrepreneurs and of government officials, and simultaneously provides feedback to them as to the success of politics in terms of their objectives.¹⁰⁰

Like import substitution, the discovery of the export promotion strategy appeared to have occurred accidentally. Haggard, Kim and Moon (1991) point to the effects of the “poor harvests” combined with “the expectations of devaluation and rumors of a U.S. cutoff” which led to food and foreign exchange shortages as the genesis of South Korea’s export promotion strategy in the early 1960’s.¹⁰¹ By 1965, the export promotion strategy was formalized within South Korea’s Ministry of Commerce and Industry’s Export Promotion Subcommittee¹⁰². South Korean export promotion policies included the establishment of subsidies and access to cheap credit for exporters¹⁰³ which were tied to export targets for firms in each sector¹⁰⁴. The South Korean government also concentrated on maintaining the quality of exports and on marketing efforts to US

⁹⁷ William J. Baumol, “Entrepreneurship: Productive, Unproductive, and Destructive,” *The Journal of Political Economy* 98, no. 5 (1980).

⁹⁸ Krugman, “Cycles of Conventional Wisdom on Economic Development,” p.730.

⁹⁹ *Ibid.*: p.731.

¹⁰⁰ Krueger, “Trade Policy as an Input to Development,” p.291.

¹⁰¹ Haggard, Kim, and Moon, “The Transition to Export-Led Growth in South Korea: 1954-1966,” p.863.

¹⁰² *Ibid.*: p.865.

¹⁰³ *Ibid.*: pp.867-68.

¹⁰⁴ *Ibid.*: p.866.

companies.¹⁰⁵ Amsden (1991), comparing the successful Asian economies with flagging Asian export promoters such as the Philippines, found that in the successful East Asian economies, subsidies were linked to “concrete performance standards with respect to output, exports, and eventually, R&D.”¹⁰⁶ Glick and Moreno (1997), in their review of government policies used by the Asian miracle countries, also found that,

Government support was by and large given to firms according to their success in the market place, particularly world markets. Somehow East Asian policymakers avoided the temptation to direct most resources to subsidize loss-making firms or to benefit well-connected rent-seekers.¹⁰⁷

While export promotion strategies in South Korea, Singapore, Hong Kong and Taiwan emphasized productivity and created pseudo market conditions, the strategies employed in Latin America, the Caribbean and Africa appear somewhat different. For these regions, export promotion consisted of, almost entirely, the creation of export processing zones – special liberal carve-outs from the domestic economy where foreign exporting firms could operate¹⁰⁸. By the beginning of the 1980’s, Wong and Chu (1984) found that 60 export processing or free trade zones had been established throughout the world.¹⁰⁹ By 2004, there were over 4000 EPZs throughout the world.¹¹⁰ In their discussion of Asia EPZs, Wong

¹⁰⁵ Ibid.

¹⁰⁶ Alice H. Amsden, “Diffusion of Development: The Late-Industrializing Model and Greater East Asia,” *The American Economic Review* 81, no. 2 (1991): p.284.

¹⁰⁷ Reuven Glick and Ramon Moreno, “The East Asian Miracle: Growth Because of Government Intervention and Protectionism of in Spite of It?,” *Business Economics* 32, no. 2 (1997): p.23.

¹⁰⁸ Dorsati Madani, “A Review of the Role and Impact of Export Processing Zones,” *World Bank Policy Research Working Paper* 2238 (1991).

¹⁰⁹ Kwan-Yiu Wong and David K. Y. Chu, “Export Processing Zones and Special Economic Zones as Generators of Economic Development: The Asian Experience,” *Geografiska Annaler* 66, no. 1 (1984): p.1.

¹¹⁰ International Labour Organization, *Export Processing Zones: Epz Employment Statistics* (4 February 2004 2004 [cited October 31 2006]); available from <http://www.ilo.org/public/english/dialogue/sector/themes/epz/stats.htm>.

and Chu (1984) find that despite the large incentives¹¹¹ provided to attract foreign investment to these zones, many had not performed well in terms of stability of employment, technology transfer, the creation of forward and backward linkages with the local economy nor in the promotion of regional development compared to East Asia's miracle countries domestic export promotion markets.¹¹²

Alarcon and McKinley (1992) discuss the export promotion experiences of Mexico and Brazil in the 1980's and also find that there was little impact on development¹¹³, linkages to the domestic economy¹¹⁴ and productivity growth (measured by "value added")¹¹⁵. In the Caribbean, after failed attempts at import substitution and declining terms of trade for agriculture and primary product exports, governments began to embrace export promotion policies aimed at attracting foreign direct investment for the production of non-traditional manufactured products by offering attractive incentives. Pantin's (1990) and Goss and Conway's (1992) discussion of export promotion through foreign direct investment reveal that these strategies had little impact on economic development for many Caribbean countries.¹¹⁶ Griffith (1990) finds that, notwithstanding the Caribbean region's proximity to the United States and its relatively low labor costs, the impact of the Caribbean Basin Initiative (the CBI) and the resulting export processing zones were likely to be limited because of the "quality of investment occurring under the CBI".¹¹⁷ In Nigeria, export processing zones, first created in 1991, were subject to government regulation with respect to the types of business which could to operate

¹¹¹ Wong and Chu, "Export Processing Zones and Special Economic Zones as Generators of Economic Development: The Asian Experience," p.4.

¹¹² Ibid.: pp.6-14.

¹¹³ Diana Alarcon and Terry McKinley, "Beyond Import Substitution: The Reconstruction Projects of Brazil and Mexico," *Latin American Perspectives* 19, no. 2 (1992): p.86.

¹¹⁴ Ibid.: p.84.

¹¹⁵ Ibid.

¹¹⁶ Dennis A. Pantin, "Prospects for the Fdi Export Model in Jamaica and the Caribbean," *Latin American Perspectives* 17, no. 1 (1990). And Benjamin Goss and Dennis Conway, "Sustainable Development and Foreign Direct Investment in the Eastern Caribbean: A Strategy for the 1990's and Beyond?," *Bulletin of Latin American Research* 11, no. 3 (1992).

¹¹⁷ Winston H. Griffith, "Caricom Countries and the Caribbean Basin Initiative," *Latin American Perspectives* 17, no. 1 (1990): p.42.

within them.¹¹⁸ However, Ikeyi (1998), in an analysis of the 1996 Nigerian EPZ promotion law, correctly points out that,

[The law] does not seek to ensure that all the objectives for establishing the zones are realized. There are no clear incentives for skills acquisition and technology transfer through manpower development programmes and research and development (R&D) activities...no incentives for linkages with other enterprises outside the EPZs.¹¹⁹

The export promotion strategies pursued by the successful Asian industrializers and the free zone-FDI oriented approaches of other developing countries resulted in significant differences for entrepreneurship. The more recent export promoters became trapped in low-skill production based on comparative advantages in abundant low-skill labor, geographic location and attractive incentives rather than utilizing a dynamic process of increasingly sophisticated production based on human capital comparative advantages. Indeed, for many countries engaged in export promotion, Grossman and Helpman's (1990) predicted knowledge spillovers did not occur¹²⁰ as "the technology flows [were] anything but automatic."¹²¹

On the other hand, the successful countries appeared to have created a better environment for entrepreneurs. Describing the East Asian Miracle, Lucas (1993) points out that with at each stage along its export promotion strategy, the quality of education and human capital together with physical capital improved¹²². This dynamic process enabled both local and foreign entrepreneurs operating in successful East Asian economies to produce, on a large scale, an updated and new mix of goods with higher potential "learning spillover technolog[ies]".¹²³ Lucas' (1993) model also

¹¹⁸ Nduka Ikeyi, "The Export Processing Zones and Foreign Investment Promotion in Nigeria: A Note on Recent Legislation," *Journal of African Law* 42, no. 2 (1998): p.224.

¹¹⁹ *Ibid.*: p.228.

¹²⁰ Gene M. Grossman and Elhanan Helpman, "Trade, Innovation, and Growth," *The American Economic Review* 80, no. 2 (1990): p.86.

¹²¹ *Ibid.*: p.91.

¹²² Robert E. Lucas, "Making a Miracle," *Econometrica* 61, no. 2 (1993): p.258.

¹²³ *Ibid.*: p.259 and pp.66-67.

demonstrated why countries which pursued import substitution did not experience an industrialization *miracle*. He notes that, import substitution resulted in, “a one-time stimulus to productivity, and thereafter the mix of goods produced in this closed system can change only slowly, as the consumption mix changes.”¹²⁴

This paper also argues that both import substitution and the EPZ-type of export promotion pursued by many developing countries encouraged *unproductive entrepreneurship and rent seeking* rather than socially productive entrepreneurship¹²⁵. More importantly, however, that these economies needed special zones with tax holidays, liberal foreign exchange, customs and labor regulations and special infrastructure indicated that there were fundamental domestic institutional deficiencies which would have negatively impacted entrepreneurs that tried to operate in the local economy. While import substitution eventually formally came to an end in many countries, the export processing zone model continues to create poor environments for ‘productive’ entrepreneurship and economic development, particularly where the domestic economy remains closed and linkages with the rest of the economy remain scarce¹²⁶. As Baumol, Litan and Schramm (2006) point out, that it is only through backward and forward linkages with the domestic economy, “as has happened in Taiwan, will local governments then also rapidly spur the development of local entrepreneurs.”¹²⁷

8.3 Research Question and Hypothesis

This paper examines an important question related to entrepreneurship in developing countries. Do the barriers to entrepreneurship impede economic growth? Thus far, this paper has asserted that institutions matter for entrepreneurship and economic growth. The earlier discussion of import substitution and export promotion revealed that these development strategies created poor business environments. As shown by Laumas (1962), in some instances, government policy can *crowd out*

¹²⁴ Ibid.: p.270.

¹²⁵ Baumol, “Entrepreneurship: Productive, Unproductive, and Destructive.”

¹²⁶ See Nicola Virgill, “Export Processing Zones: Pathways to Development or Globalization on the Cheap?” (George Mason University, 2006).

¹²⁷ Baumol, Litan, and Schramm, “Unleashing Entrepreneurship in Less Developed Economies,” p.20.

entrepreneurship.¹²⁸ Import substitution was associated with persistent price distortions, overvalued exchange rates, production inefficiencies and corruption. Enclave type export promoting strategies which focused, almost exclusively, on encouraging FDI often neglected the development of key institutions in the domestic economy.

This paper therefore tests the hypotheses that countries which provide more entrepreneurial friendly environments will experience better economic performance measured by gross national income per capita. A key assumption is that entrepreneurship flourishes in a more business friendly environment where rules for establishing a business are clear and straightforward, property rights are protected, labor market are flexible, and market information is available.

8.4 Data and Methodology

This paper examines the effects of institutional factors related to a country's business environment (i.e. the average number of business formation procedures, the number of contracting procedures, the number of documents required for importing and exporting activities, a measure of labor market difficulty, average tax rates, closing costs, credit bureau coverage, and civil liberties) on economic performance using data from the World Bank's "2005 Doing Business Index"¹²⁹ and Freedom House's index on civil liberties. The average procedures variable (AVGPROCEDS) consists of the average number of procedures required to start a business, obtain a licence and register property. The contracting procedures variable (CNTRCTPRO) measures the number of procedures involved with enforcing a contract. The labor difficulty index variable (LABDIFFINDEX) is the sum of a country's hiring and firing difficulty indexes. A measure is included of a country's credit bureau coverage (CREDBURCOV) which is the sum of coverage of public and private credit bureaus in a country. Variables to measure the average tax rate (TAXRT), the cost of closing a business as a percentage of the value of the property (CLOSECOST) and the total number of documents required for importing and exporting (TOTEXIMDOCS) are included. A variable

¹²⁸ P.S. Laumas, "Schumpeter's Theory of Economic Development and Underdeveloped Countries," *The Quarterly Journal of Economics* 76, no. 4 (1962): pp.653-56.

¹²⁹ World Bank, *Doing Business: Benchmarking Business Regulations* (2005 [cited 12 October 2006]); available from <http://www.doingbusiness.org/>.

which measures the informal economy (PERINFORMAL) was also included as an indication of the general level of development within a country. An index of civil liberties (CIVLIB) has also been included as a measure of freedom within a country. A score of 1 indicates a high degree of civil liberties and a score of 7 represents low levels of civil liberties.¹³⁰ Descriptive statistics of these variables are provided in Table 8.1.

OLS regression analysis is used to test the hypothesis that economic performance is negatively affected by the entrepreneurial barrier. This regression tested how GNI per capita could be affected by the number of procedures to start a business, a country's labor market rigidity, the difficulty of enforcing contracts, its tax rates, closing costs, credit bureau coverage, the complexity of its importing and exporting procedures, the level of its informal economy and the degree of civil liberty. Higher average number of procedures, contracting procedures and labor difficulty index scores are assumed to indicate business environments with greater obstacles for entrepreneurs and should be negatively related to GNI per capita. Greater credit bureau coverage is considered to be positively related to the level of financial development and would positively affect the efficient allocation of credit. Therefore, it would be expected that this variable would be positively associated with GNI per capita. Countries with higher tax rates, closing costs and those which require large numbers of documents to import and export are presumed to be less business friendly and should be negatively related to GNI per capita. More developed economies are expected to have a smaller informal economy. Additionally, a country's informal economy is also likely to be an indicator of the level of *necessity entrepreneurs*¹³¹.

¹³⁰ Source: Freedom House.

¹³¹ Zoltan J. Acs and Attila Varga, "Entrepreneurship, Agglomeration and Technical Change," *Small Business Economics* 24 (2005).

Table 8.1. Descriptive Statistics by Region.

	Africa	Middle East and North Africa	Transit- ioning Europe	East Asia	South Asia	Latin America	OECD	All Regions
Economic Performance Variable								
Average GNI per capita	906.83	4,439.44	3,933.20	10,271.25	1,328.75	2,612.00	28,402.69	8,816.45
Std. Err.	191.89	1,315.84	688.16	3,948.57	291.93	365.15	2,418.52	1,224.89
Business Environment Variables								
Average Number of Procedures to Start a Business	13.20	12.61	12.27	10.73	11.04	11.48	8.72	11.42
Std. Err.	0.72	0.73	0.48	1.80	0.76	0.62	0.61	0.30
Average Score on the Labor Difficulty Index	81.45	68.17	77.68	65.20	82.00	74.31	57.39	72.23
Std. Err.	10.30	14.28	6.32	27.17	15.87	8.14	7.97	3.93
Average Number of Procedures to Enforce a Contract	29.70	39.33	29.55	26.00	31.78	34.06	19.78	29.27
Std. Err.	2.43	4.05	1.80	0.95	2.90	2.08	0.99	1.02
Average Tax Rate	47.92	40.37	51.46	33.42	39.77	60.44	46.53	48.01
Std. Err.	1.79	9.63	4.18	5.55	4.64	7.34	2.29	1.98
Average Closing Costs	17.30	14.83	13.68	8.80	17.67	16.38	8.39	13.86

	Africa	Middle East and North Africa	Transit- ioning Europe	East Asia	South Asia	Latin America	OECD	All Regions
(% value property value)								
Std. Err.	1.45	2.35	2.23	3.60	3.97	2.66	1.23	0.89
Average Percent Credit Bureau Coverage	7.57	3.43	7.20	20.18	6.94	42.49	60.00	24.06
Std. Err.	3.78	1.35	2.60	11.70	3.85	7.85	7.47	3.11
Average Number of Documents required for Importing and Exporting	21.45	18.83	18.41	16.40	19.56	17.50	12.43	17.61
Std. Err.	1.14	1.83	0.87	1.60	1.27	0.88	1.10	0.53
Average Percent of Informal Economy	41.58	29.26	37.68	20.52	33.58	42.45	17.79	32.76
Std. Err.	2.03	2.53	2.63	4.66	4.14	3.45	1.30	1.35
Average Civil Liberties Score	3.45	5.17	2.77	3.60	3.67	2.56	1.22	2.91
Std. Err.	0.33	0.27	0.38	0.93	0.29	0.22	0.11	0.16

8.5 Analysis of Results

8.5.1 The Entrepreneurial Barrier and Economic Performance

This paper's model examined the impact of barriers to entrepreneurship on economic performance. The model explained 66.8 percent of the variance in per capita gross national income. All of the variables were statistically significant at the 0.1 level and all but average procedures and tax rates were significant at the 0.05 level (see Table 8.2). In particular, lower levels of civil liberties (Civlib), more cumbersome procedures for starting businesses (avgproceeds) and complex importing and exporting (toteximdocs) were associated with considerably lower levels of per capita GNI. Rigid labor processes (Labdiffindex), complex contract enforcement procedures (Cntctpro), high tax rates (taxrt) and closing costs (closecost) were also associated with lower levels of per capita GNI. Higher percentages of the informal economy were also associated with lower levels of GNI per capita. Finally, greater credit bureau coverage (Credburcov) was associated with higher levels of per capita GNI.

Given the results presented below, the hypothesis presented in this paper – that countries which provide more business friendly institutions have better economic performance – cannot be rejected. While causation cannot be determined, it is reasonable to suggest that countries which seek to improve their economic performance should improve their business environments. For example, improvements in business start-up, contracting processes, closing costs and importing and exporting procedures are important. This paper's earlier discussion of import substitution and enclave-type export promotion revealed that countries which used these strategies constructed complex bureaucracies to manage their economies. These countries also distorted exchange rates to encourage exports and to discourage imports in certain sectors. It was also found that entrepreneurs in developing countries generally acknowledged that customs and foreign exchange regulations and the exchange rate regime were important obstacles to doing business (See Figure 8.1).

Table 8.2. The Effects of Business Institutions on Economic Performance.

Dependent Variable GNI per capita					
Independent Variables	Coef.	Std. Err.	t	P> t	Beta
AVGPROCEDS	-517.23	273.58	-1.89	0.06	-0.13
LABDIFFINDEX	-40.54	19.23	-2.11	0.04	-0.13
CNTRCTPRO	-156.20	76.67	-2.04	0.04	-0.13
TAXRT	-70.15	36.89	-1.9	0.06	-0.11
CLOSECOST	-165.10	83.38	-1.98	0.05	-0.12
CREDBURCOV	63.55	30.66	2.07	0.04	0.16
TOTEXIMDOCS	-465.19	162.91	-2.86	0.01	-0.20
PERINFORMAL	-228.78	64.94	-3.52	0.00	-0.25
CIVLIB	-1428.00	572.72	-2.49	0.01	-0.19
_cons	46202.19	4673.43	9.89	0.00	.

R-Squared = 0.668

N = 107

Increasing civil liberties is also associated with better economic performance. While this model has no specific variable to measure corruption, Pritchett and Kauffman (1998), referring to the performance of World Bank projects, point out that “civil liberties are likely to have an effect precisely by affecting intermediate measures of government performance like credibility and corruption”.¹³² This paper’s discussion also revealed that entrepreneurs in developing countries found corruption to be a major obstacle to doing business and that import substitution, in particular, created opportunities for corruption. Therefore, improvements in governance and anti-corruption measures which would be reflected in improved civil liberties scores will also positively affect economic performance.

Finally, Hermes and Lensink (2003) find that “the development of the financial system of the recipient countries is an important precondition for FDI to have a positive impact on economic growth.”¹³³ This is consistent with this paper’s finding that improving the financial system by extending a country’s credit bureau coverage can also have a positive impact on economic performance. One explanation for this finding could be that

¹³² L Pritchett and D Kaufmann, “Civil Liberties, Democracy, and the Performance of Government Projects,” *Finance and Development* 35, no. 1 (1998): p.27.

¹³³ N Hermes and R Lensink, “Foreign Direct Investment, Financial Development and Economic Growth,” *The Journal of Development Studies* 40, no. 1 (2003): p.158.

financial sector development was ignored because manufacturing plants were typically funded by foreign capital – bypassing the local financial system. This explanation seems plausible given the purpose of EPZs – to attract FDI for export production.

8.6 Recommendations for an Entrepreneurial US Foreign Policy

Given this paper’s findings – that developing countries face greater institutional barriers to entrepreneurial activity and that these institutional barriers negatively impact economic performance – **it is recommended that the promotion of entrepreneurship and entrepreneurial institutions through targeted development assistance aimed at business environment restructuring become a key foreign policy objective for the United States.** This paper offers that entrepreneurship and business promotion may be both technically feasible and readily accepted throughout the world while also meeting a core US foreign policy objective of democracy promotion.

First, all societies have experience with traders, shopkeepers, market vendors and businesspeople. Second, the improvement of a country’s business environment is not ideologically based. Today, most countries allow market interactions, albeit in varying degrees. Third, the elements of a better business environment such as effective institutions, protection of property rights, flexible labor markets and the provision of market information are all important building blocks for democracy.

Leibenstein (1968), discussing an appropriate focus for economists’ work on entrepreneurship, offers insight for a comprehensive framework for a US foreign policy program for entrepreneurship promotion. He states that,

Development economists [should] focus their attention when concerned with specific countries on studying the gaps, obstructions, and impediments in the market network of the economy in question and on the gap-filling and input-completing capacity and responsiveness to different motivational states of the potential entrepreneurs in the population.¹³⁴

Leibenstein’s (1968) recommendation contains two areas for policy action – institutional factors which affect entrepreneurial opportunity and

¹³⁴ Leibenstein, “Entrepreneurship and Development,” p.83.

capacity factors which affect entrepreneurial quality. A two-fold program is therefore recommended. First, US foreign policy should focus on the institutional barriers to entrepreneurship and economic development in developing countries.

As this paper's discussion of import substitution and EPZ-type export promotion strategies and its analysis of regional business obstacles reveals, many developing countries' business environments are rife with inefficiencies, complex bureaucracies for managing trade and business start-ups and foster corruption. This paper, therefore, recommends that development assistance be targeted at improving countries' business environments by providing technical assistance for the streamlining of business start-up procedures and importing, exporting and customs processes and the development of modern financial markets. Additionally, existing programs which focus on good governance, anti-corruption measures and macroeconomic stability should be continued and enhanced. These areas were all shown to be particularly problematic for entrepreneurs from developing countries (See Figure 1).

Second, US foreign policy should focus on the development of potential and existing entrepreneurs – the supply and quality of entrepreneurs. This paper recommends that assistance be directed to entrepreneurship and general managerial skills development in developing countries. Like Baumol, Litan and Schramm (2006), this paper recommends the creation of programs to provide entrepreneurial and general business experience to potential entrepreneurs from developing countries.¹³⁵

8.7 Conclusion

Kirzner (1985) cautions that entrepreneurship and the entrepreneur should not be taken for granted in an economy.¹³⁶ This paper offers that this is exactly what has occurred in development policy over the last 60 years, as third world countries opted to use more state-guided policies for economic development. In the process barriers were constructed which, in some cases, limited the role of and opportunity for the entrepreneur and in other cases directed entrepreneurship to socially unproductive purposes. However, as policy makers begin to embrace the role of entrepreneurship

¹³⁵ Baumol, Litan, and Schramm, "Unleashing Entrepreneurship in Less Developed Economies," p.54.

¹³⁶ Israel M. Kirzner, *Discovery and the Capitalist Process* (Chicago: University of Chicago Press, 1985) p.91.

in economic development, this paper offers a number of ways that US foreign policy can also assist in this process by (a) targeting development assistance to the creation of business environments which support entrepreneurial activities and (b) creating new programs which develop entrepreneurial skills – thus rolling back the *entrepreneurial barrier* while expanding the *knowledge-opportunity matching process*.

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9. Innovation in Manufacturing

Juan Julio Gutierrez

9.1 Introduction

According to Malecki (1994) there are several levels of meaning for the term entrepreneurship. First, entrepreneurship refers to small firms; and in many settings in the developing world, a large proportion of them are survival enterprises outside the legal status of other economic activities (De Soto, 1989). Second, entrepreneurship refers to firm formation or the addition of new enterprises to the economy. Finally, entrepreneurship entails innovation (rather than imitation). This view is compatible with Schumpeter's typology (1934) of entrepreneurial opportunities included in: a) new products, b) new production processes, c) new markets, d) new sources of raw materials and e) new forms of organization.

Moreover, Baumol, et al (2006) also uses the term entrepreneur within the third level of meaning: "as an entity, new or existing that provides a new product or service, or that develops and uses methods to produce or deliver existing goods and services at lower costs". In this way entrepreneurs increase the wealth of a nation or region. The Kaufmann Foundation policy paper (2006) mentions the existence of two types of entrepreneurs, innovative and replicative, but it stresses that radical innovation, associated with innovative entrepreneurs, has driven productivity growth. In this paper we equate the term entrepreneur to Baumol's definition within which Schumpeter's typology fits well. Since entrepreneurs are wealth creators, it is vital to devise public policies designed to foster the entrepreneurs' production of innovative outputs.

However, entrepreneurs usually encounter some obstacles to their attempts to generate new products and processes. As Storey (2003) points out, "in the context of public policy intervention the key assumptions most likely to be contravened are those of perfect information and the absence of externalities". The Kauffman Foundation policy paper (2006) states that

a way to level the playing field between entrepreneurs and larger established firms is to provide equal awareness to all of foreign technology. Therefore, it is argued that foreign technology could be a mechanism to transfer new technology and decrease the information “gap” for local innovative firms. Furthermore, other literature acknowledges that access to foreign technology could lead to positive productivity externalities to domestic firms (Smarzyka, 2003).

Developing countries are situations where access to foreign technology may occur. Thus, full or partial foreign ownership of local firms should enhance technology transfer, and it could take two forms: 1) a subsidiary of a multinational company, b) a domestic firm partly foreign owned. Other vehicles of technology transfer are subcontracting and licensing. However, the empirical literature finds mixed evidence on the existence of positive productivity externalities including technology transfer generated by the presence of foreign multinational companies in the host country (Alfaro et al, 2006).

Within a developing country context, this paper examines the drivers of innovative outputs. Access to foreign technology within the firm’s internal network (intra-firm cooperation) is one driver. However, foreign technology can also be accessed through external networking (inter firm networking) by subcontracting and licensing. Further, external inter firm networking also encompasses relationships with suppliers and clients, but also interactions with local as well as non-local institutions, such as universities and chambers of commerce and other trade associations (Zanfei, 2000). Finally, the last drivers are innovation inputs, considering efforts in technology adoption and adaptation, but also including non-R&D inputs to innovation such as acquisition of machinery and equipment and training (Kline and Rosenberg, 2000).

Finally, the paper explores significant differences in innovation by manufacturing sector and firm size. The paper is presented in 5 parts. Part 1 explores the role of public policy in encouraging foreign technology transfer, in particular foreign direct investment. Part 2 examines the literature on internal and external networks to the firm and innovation outputs with special emphasis on low technology industries, which are prevalent in most of the developing world and their interaction with high technology industries. Part 3 presents a model on the drivers of innovation output. Innovation outputs are defined as in the classic work of Schumpeter (1934), and the drivers are built on previous work on internal and external networks by Zanfei (2000) and innovation inputs (Kline and Rosenberg, 1986). Part 4 tests the model and presents the results using firm level data from the World Bank’s Investment Climate Survey of 4 Central American countries. The data comprises firm information at the factory

level in low technology sectors. Finally, Part 5 presents the results and offers some observations on the public policy implications of the results.

9.2 Part I- Public Policy and foreign technology transfer

As a starting point, public policies should not try to give preferential targeting to specific industries as it usually lowers national welfare because governments are less efficient than markets at allocating resources across alternative uses and because resources are likely to be wasted on lobbying efforts by industries seeking special treatment (RAND, 2004). However, Helpman and Krugman (1985) observe that governmental protection and promotion of a particular industry is suitable if the industry creates large spillover benefits for other economic activities.

It has been argued that access to foreign technology decreases the information “gap” faced by innovators (Kauffman Foundation, 2006) and also produces spillovers to the rest of local firms. Blomström and Kokko (1998) describe the scenarios by which these spillovers enhance economic growth, “spillovers may take place when local firms improve their efficiency by copying technologies of foreign affiliates operating in the local market either based on observation or by hiring workers trained by the affiliates. Another kind of spillover occurs if multinational entry leads to more severe competition in the host country market and forces local firms to use their existing resources more efficiently or to search for new technologies” (in Smarzycka pp 5 2003).

However, empirical analysis based on firm-level panel data, which examines whether the productivity of domestic firms is correlated with the extent of foreign presence in their sector or region cast doubt on the existence of spillovers from FDI in developing countries.¹ (Smarzycka, 2003; Alfaro & Rodriguez-Clare 2004). Although, the picture is more optimistic in the case of industrialized countries as a recent paper by Haskel, Pereira and Slaughter (2002) provides convincing evidence of positive FDI spillovers in the UK.

Rodriguez-Clare (1996) finds that linkage or spillover effects of foreign companies on host countries are more likely to be positive when the good or service produced by foreign companies uses intermediate inputs intensively, when there are large costs of communication between headquarters and the local plant and when host and home countries are not

¹ Haddad and Harrison (1993) on Morocco, Aitken and Harrison (1999) on Venezuela and Djankov and Hoekman (2000)

too different in terms of the variety of intermediate goods produced. Moreover, if these conditions are reversed then multinationals could have a negative effect on the developing economy through creation of enclaves with little connection to the domestic economy.

Therefore, the existence of FDI spillovers in the same sector seems dubious and to have spillovers across sectors there is a need of a defined set of conditions. Spillovers across sectors can be characterized by the links between foreign firms and their local suppliers (backward linkages). Such spillovers can operate through: (i) direct knowledge transfer from foreign customers to local suppliers; (ii) more demanding requirements regarding product quality and on-time delivery introduced by multinationals, that provide incentives to domestic suppliers to upgrade their production management or technology; (iii) indirect knowledge transfer through labor turnover; (iv) increased demand for intermediate products due to multinational entry, that allows local suppliers to reap the benefits of scale economies; (v) competition effects, by which multinationals acquiring domestic firms may choose to source intermediates abroad thus breaking existing supplier-customer relationships and increasing competition in the intermediate products market (Smarzyska, 2003).

Altenburg (2000) among other authors finds that linkages between foreign firms and local suppliers are stronger if foreign affiliates are domestic-market-oriented and thus tend to purchase more locally than export-oriented foreign firms. Second, it has also been argued that affiliates established through mergers and acquisitions or joint ventures are likely to source more locally than those that are built from the scratch (i.e. greenfield projects). While the latter have to take time and effort to develop local linkages, the former can take advantages of the supplier relationships established by the acquired firm or their local partner (UNCTC 2001).

9.3 Part II – Internal and external networks and inputs in low technology industries

So a question remains about what the role of host countries and local firms is (both foreign subsidiaries and locally owned). Is their role almost exclusively in the adoption and diffusion of a centrally created technology (i.e. by foreign companies)?

Foreign companies have recently transitioned towards a new organizational mode defined as a “double network” Zanfei (2000). On one

hand, the internal network functions or links between different units of the same firm, for instance vertical and unidirectional knowledge transfer from headquarters to local subsidiaries. However, the knowledge spillovers to other firms outside the foreign owned company are uncertain as described in the previous part of the paper. The potential for knowledge spillovers is related to the type of FDI and the level of human capital in the host country. FDI in high technology industries is more likely to generate knowledge-intensive spillovers (Acs et al, 2006). Therefore one obvious question this paper tries to answer is if knowledge spillovers, in terms of innovative outputs, occur also in low technology sectors.

On the other hand, subsidiaries develop external networks with other firms and institutions separate from the foreign owned firm to gain access to local sources of information and application abilities (Zanfei, 2000).

Locally owned firms also benefit from both inter firm and institutional external networks. In addition, locally owned firms have other channels to access foreign technology besides foreign ownership, technology transfer occurs through market transactions deliberately negotiated between parties (Barba Navaretti & Venables, 2004). Transfers may take the form of licensing agreements or be part of a package of upgrading efforts associated with the supply of inputs (i.e. subcontracting). However, according to Acs et al (2006) foreign firms may have concerns about piracy of intellectual property, reverse engineering of goods and also differing production qualities of branded goods.

The framework for analyzing the drivers of innovative output in terms of the channels for technology transfer that a firm either foreign or locally owned has been presented. Now the investigation turns to a question of what inputs are needed to generate the innovative outputs, focusing on those prevalent in low technology manufacturing firms.

In manufacturing sectors learning by doing is an integral component for gaining incremental innovation, therefore the separation of R&D facilities from the manufacturing plant are ineffective (Kelley et al, 2004). Specifically, in low technology industries many of the innovations and adoption of related activities operate in practical and pragmatic ways by doing and using (Von Tunzelmann and Acha, 2005). In poor developing countries firms are very likely to lack the budget to perform R&D or few firms categorize any expenditure as R&D (Recanatini et al, 2000), and thus adoption and adaptation by doing and using are major inputs to the generation of innovative outputs.

Yet, low technology manufacturing firms are a vehicle for spreading and implementing technologies embodied in equipment and capital goods and basic materials requiring only traditional R&D expenditures. Low

technology firms generate innovative outputs by using new machinery and equipment. Therefore, low technology sectors could serve as carrier industries for diffusing the gains of new technologies and for incorporating advancements in the production of the products they yield as well as providing feedback to tune up products and processes.

For example, wearing apparel and fur (ISIC – 18) production can benefit from the use of inputs generated by advanced technology industries such as computer and advanced instrumentation manufacturing which are used to design durable water repellent finishes in textiles or to test windproof fleece. In that sense, innovation in industries regarded as low technology could be fostered by increasing interaction with advanced technology inputs. There is a complementarity between low technology and high technology manufacturing, because most products from the latter are producer goods (i.e., inputs into traditional production), not consumer goods (Kelley et al, 2004).

Local firms both foreign and locally owned are more likely to use high technology inputs if the market for the final product is global. In this case, local suppliers may not be able to satisfy the demand of high technology inputs because of higher quality requirements or constraints imposed by the parent company, etc. (Smarzycka, 2003).

9.4 Part III- A Model on the drivers of innovative output

9.4.1 Data

The paper uses a cross country database at the factory level for four Central American countries², the World Bank Investment Climate Survey (ICS). The sample of 1771 observations was drawn from industrial registries in the four countries and encompasses establishments from seven low technology manufacturing sectors (see footnote 6 for the list). The survey requested a broad array of factory characteristics as well as firm traits on plant size, sector, innovation and technology change channels.

The ICS database is moderately disaggregated; the industries are defined at the 2 digit International Standard Industrial Classification (ISIC) system. The 4 countries studied are participant in a Free Trade Agreement

² The database contains a total of 1772 observations of manufacturing firms legally registered in 5 countries (El Salvador, 465 obs.; Guatemala, 431 obs.; Honduras, 439 obs.; Nicaragua, 436 obs.)

with the US (CAFTA) allowing them to enjoy tariff free exports for certain line items. However, the information is not panel data, which poses some weakness to the study: a) no research can be done on the effects of policy interventions and the process of industry evolution. B) Attrition bias may arise when firms disappear (exit) because of mergers, acquisition, consolidation, or bankruptcy, or when a firm is included in the sample only if it survives up to the point of interview. Without accounting for attrition, the sole reliance on surviving firms will inevitably bias (usually upward) performance measurements (i.e. production of innovation outputs).

9.4.2 Dependent Variable: Innovative Outputs (IO) (see annex 1 for variable operationalization)

Following the Schumpeterian typology, innovation outputs take the form of: a) new products, b) new production processes and an additional one in the form of c) improvements in existing products. The rationale behind this last innovation output is based on Kline and Rosenberg's (1986) insight that innovation implies not only the creation of completely new products or processes but incremental changes in product performance which may (over a long period) have major technological and economic implications. The ICS surveys obtain information for these three innovation outputs by asking if the establishment (plant) had initiated any of the three types of output innovations in the previous 2 years, therefore each is a dichotomous variable where 0 = "did not initiated the activity" and 1 = "initiated the activity". As we can see in Table 1, the results of the ICS suggest that a substantial proportion of low technology factories produce innovative outputs. About half of factories had produced new products or improved significantly existing ones. Moreover, 80% of surveyed factories report that they developed new production processes.

Table 9.1. Factories producing innovative outputs.

Type of Innovation	# Factories	%
1-new products	935	52.8
2- new production processes	1,423	80.4
3- improvements in existing products	862	48.7

Source- World Bank Investment Climate Survey- Author's calculations

9.4.3 Independent Variables

- A. **Internal networks** (Intra firm cooperation variables, IN): the factory is considered under foreign ownership if foreign capital is 10% or greater, which will be an indication of a joint venture. This is the same cut off used by Smarzyka (2003). A firm is also considered under foreign ownership if the establishment's (factory) main channel to acquire technology comes from the headquarters, which would be the case of a multinational subsidiary. Therefore the variable *forown* is binary and equal to 1 if it satisfies any of the two previous conditions, and equal to 0 otherwise.
- B. **External network** (Inter firm networking variables, EN): Barba Navaretti & Venables' (2004) suggest that market channels employed by domestic firms (both foreign and locally owned) to access foreign technology could take the form of subcontracting and licensing. This is measured as a dummy variable equal to 1 if the factory's main channel for acquiring new technology was purchasing a foreign license (*forlic*). Also, a dichotomous variable is created if factory's sales to multinational firms are greater than 10%, which would be an indication of subcontracting (*forsubcont*).
Yet, inter firm networking also encompasses relationships between the factory and: a) suppliers of equipment (*locsuppl*), b) clients (*locclient*) and c) licensing from other domestic firms (*loclic*). The dummy value is equal to 1 if the interaction implied a major channel for technology acquisition.
Finally, two measures of identification with a part of the institutional network (Zanfei, 2000) are created in the form of the relationships between the factory and institutions such as universities and public institutions (*locuniv*) and local chambers of commerce and other trade associations (*locchamb*).
- C. **Innovation input variables (II)**: for a sizable proportion of low technology firms in developing countries adoption and adaptation while using new technologies within the factory are primary channels for innovation rather than classical expenditures in R&D. If the factory developed and adapted technology (*D&A*) it is an input for generating innovative outputs and, therefore, the dummy has a value of 1, and 0 otherwise. Non R&D inputs to innovation are also considered (Kline and Rosenberg 1986), assuming that newer equipment represents a higher level of technology, and that technological know-how is embodied in technical personnel. If Machinery and equipment acquisition (*newequip*) and hiring of

human capital (*humanK*) are channels for new technology incorporation, the dummies take the value of 1, and 0 if not.

Table 9.2. Channels to introduce technological innovations.

A- Internal networks			
Intra firm cooperation variables			
1-foreign ownership	forown	# factories	204
		%	12%
B- External network			
Inter firm variables			
2-subcontracting	forsubcont	# factories	170
		%	10%
3-foreign license	forlic		46
			3%
4-suppliers of equipment	locsuppl	# factories	200
		%	11%
5-local license	loclie	# factories	18
		%	1%
6-clients	locclien		128
			7%
Institutional networking variables			
7-universities and public institutions	locuniv	# factories	45
		%	3%
8-chambers of commerce	locchamb	# factories	67
		%	4%
C- Innovation input variables			
9- Machinery and equipment acquisition	newequip	# factories	942
		%	53%
10-Human capital hiring	humanK	# factories	654
		%	37%
11-development and adaptation	D&A	# factories	523
		%	30%

Source- World Bank Investment Climate Survey- Author's calculations

The factories surveyed in the ICS had made relatively more use of innovation inputs as channels of technological change, with machinery and equipment acquisition being the more frequent (Table 9.3). On the other hand, a smaller proportion of factories had used both internal intra firm network and external networks (inter firm and institutional).

9.4.4 Control Variables

- Firm size³: Micro/small: 1-25 permanent workers, Medium: 26-75 permanent workers, Large: more than 75 workers
- Industry Sector⁴.

The distribution of factories by size are consistent with what has been observed in developing countries, the so-called “missing middle” phenomenon, where there are some large firms and many small firms, but very few middle-sized firms, which are common in industrialized countries (Recanatini et al, 2000). Some believe an explanation of this phenomenon lays in a the presence of a small market, which have also been suggested as a barrier to technological change.

9.4.5 Model specifications

$$IOi^5 = b1 \text{ Factory Size } i + b2 \text{ Sector} + E \quad (1)$$

$$IOi = b1 \text{ Factory Size } i + b2 \text{ Sector } j + b3 \text{ Internal network (intra-firm) variables (IN)} + b4 \text{ External Network (Inter firm + Institutional) variables (EN)} + b5 \text{ Innovation inputs (II)} + E^6 \quad (2)$$

The ICS has a set of questions to define innovative vs non innovative factories, so the innovation function specification has a binary variable accounting for the propensity to innovate. A logistic regression technique is appropriate to accommodate the dichotomous characteristic of the dependent variable and its results are easier to interpret than other dichotomous regression techniques (e.g. probit).

³ Firm sizes: micro/small, medium. Contrast dummy: large firm

⁴ Sectors: Beverage and food, Textiles, Garment manufacturing, Furniture and wood Paper and printing, Chemicals, rubber and plastics, Non-metallic products, Shoe manufacturing and leather. Contrast dummy: Metallic products

⁵ Innovation output a) a) new products, b) new production processes, c) improvements in existing products.

⁶ Number of independent variables: a rule of thumb is that there should be no more than 1 independent for each 10 cases in the sample. In applying this rule of thumb, keep in mind that if there are categorical independents, such as dichotomies, the number of cases should be considered to be the lesser of the groups (ex., in a dichotomy with 480 0's and 20 1's, effective size would be 20), and by the 1:10 rule of thumb, the number of independents should be the smaller group size divided by 10 (in the example, 20/10 = 2 independents maximum). <http://www2.chass.ncsu.edu/garson/PA765/logistic.htm#indep>

Table 9.3. Descriptive Statistics of Factory Sector and Size.

Sector/Factory Size	ISIC	Micro/small # factories	%	Medium # factories	%	Large # factories	%	Total # factories	%	% foreign owned
Textiles	17	33	47%	14	20%	23	33%	70	4%	23%
Wearing apparel and fur	18	170	48%	50	14%	136	38%	356	20%	23%
Chemicals and chemical products	24	96	45%	59	28%	56	27%	211	12%	13%
Food products and beverages	15	222	54%	90	22%	96	24%	408	23%	10%
Wood & products of wood & cork, exc. Furniture	20	200	74%	48	18%	21	8%	269	15%	6%
Leather and articles; footwear	19	55	80%	8	12%	6	9%	69	4%	4%
Other non-metallic mineral prod.	26	162	80%	26	13%	15	7%	203	11%	2%
Rubber and plastic products	25									
Metal products	28	125	68%	46	25%	14	8%	185	10%	9%
Total		1063	60%	341	19%	367	21%	1771		

Source- World Bank Investment Climate Survey- Author's calculations

9.5 Part IV – Results of the model test

9.5.1 Model 1

The first model tests the influence of factory size and firm sector on the three innovation outputs. The model shows that micro and small establishments (*microsmall*) (1-25 permanent employees) have about half the odds of generating two types of innovative outputs: a) new products and b) improvements in existing products, when compared to large firms. However, the capacity to generate any type of innovative outputs of medium sized factories, which employ 26 to 75 employees, is not statistically different from large firms (See Table 9.4). These results are compatible with Von Tunzelmann and Acha's (2005) view; they state that smaller firms in low technology industries are widely seen as dragging down overall performance. However, smaller firms in advanced technology sectors are seen as innovators.

When testing for sector influence on innovative outputs, the most consistent results are for non metallic products factories (*nonmetal*) which fabricate glass and ceramic products among others. The logistic model finds that odds of generating any of the three innovative outputs are about half of the metal products establishments. In addition, the testing shows only two other significant results: 1) the generation of new products in the wearing apparel and fur (*confecc*) factories have .7 lower odds than metal products establishments. This result is particularly noticeable since almost a quarter of factories in the wearing apparel and fur sector are foreign owned and a large fraction are large establishments (38%, Table 9.3). This result is similar to those of Smarzycka (2003) and Alfaro & Rodriguez-Clare (2004) who do not find evidence of spillovers from foreign ownership in local factories within the same sector. As a conclusion, innovation within the wearing apparel and fur sector at the local level is not fostered by a high presence of foreign owned factories, which is associated to larger factory size. 2) On the contrary, the creation of new production processes in the leather and articles-footwear (*leashoe*) factories have odds 3 times higher than of than factories in the metallic product sector. Foreign ownership in the *leashoe* sector only amounts to 4% of the factories and micro and small factories dominate the sector, totaling 80% of the establishment (table 9.3). The metallic sector excludes machinery and equipment and it manufactures relatively non- complex products such as parts, containers and structures, usually with a static,

immovable function. Also, there is a large presence of micro and small firms in this sector (68%) and only 9% of the factories are foreign owned (Table 9.3).

Table 9.4. Model 1 results.

Dependent / independent variables		a) new products	b) new production processes	c) improvements in existing products
FACTORY SIZE				
microsmall	Odds ratio	0.66	0.76	0.66
	Z-statistic	(3.17)**	-1.63	(3.29)**
Medium	Odds ratio	0.86	1.16	0.81
	Z-statistic	-0.93	-0.69	-1.32
FACTORY SECTOR				
Confec	Odds ratio	0.70	0.99	0.85
	Z-statistic	(1.92)*	-0.06	-0.86
Bebalim	Odds ratio	0.79	0.85	0.76
	Z-statistic	-1.30	-0.74	-1.53
Qcpl	Odds ratio	1.24	1.27	1.10
	Z-statistic	-1.04	-0.88	-0.48
Furnwood	Odds ratio	0.82	1.10	0.93
	Z-statistic	-1.01	-0.40	-0.40
Leashoe	Odds ratio	0.89	3.14	0.94
	Z-statistic	-0.42	(2.28)*	-0.21
Nonmetal	Odds ratio	0.54	0.54	0.53
	Z-statistic	(2.96)**	(2.52)**	(3.01)**
Textile	Odds ratio	0.68	0.89	1.56
	Z-statistic	-1.36	-0.33	-1.51
Constant	Odds ratio	1.84	5.01	1.48
	Z-statistic	(3.22)**	(6.70)**	(2.09)*
Observations		1771	1771	1771
* Significant at 5% level				
** Significant at 1% level				

9.5.2 Model 2

Establishment Size: In the complete model, the inclusion of the network and input variables, changes the significant relationships seen in Model 1. Now, odds ratio are found to be not significant, while the corresponding correlations are still significant. Therefore no certain global statements about significance can be made. Nevertheless, the odds ratio for

firm size in the new product and improvements in existing products are very close to one, which suggest that there is not a difference in production of innovation outputs for different factory sizes.

Sector: In general, results of sectoral influence are consistent to Model 1's. A) For the generation of the first type of innovative outputs, creation of new products, out of 7 manufacturing sectors, two had statistically significant results. Factories of garment and fur manufacturing and non metal product manufacturing show odds that are .7 and .6 of those factories devoted to metal product manufacturing. Both results are similar to Model 1, supporting the robustness of this finding. B) The second type of innovative outputs, new production processes is found to have greater odds in factories of leather and shoe manufacturing and lower in non metal product factories, as has been reported for Model 1. C) Finally, textile (*textile*) factories show odds 1.9 times higher than those of metal manufacturing establishments. The characteristics of the textile manufacturing are similar to those of the garment and fur manufacturing sector. The presence of foreign ownership is as high as in the garment manufacturing sector, 23% and the fraction of large firms is large too (33%, table 3). On the contrary, the odds of making improvements in existing products for Leather and articles-footwear (*leashoe*) factories is 4.4 times larger than those factories engaged in metal products manufacturing. Finally, factories in the non metallic production (*nonmetal*) sector show odds that are 6 of the odds of metal product manufacturing factories. In summary, innovation does not happen homogeneously across all manufacturing sectors, more importantly the relationship with foreign firms does not guarantee innovation outputs at the factory level.

Internal networks: the presence of foreign ownership (*forown*), the intra-firm channel for technological change is not a mechanism to foster innovation within the factory on any of the three innovation outputs considered. This finding is consistent with the literature review provided by Alfaro and Rodriguez-Clare (2004) who describe the lack of foreign direct investment spillovers within the same. If spillovers are to happen, they are more likely to be vertical rather than horizontal in nature. For example, foreign ownership may have positive spillovers in local suppliers through backward linkages (Smarzynska, 2003). The model tested accounts for the overall participation of foreign firms in all sectors and its influence in both within and across sector spillovers, and the results show no significance in fostering the production of innovation outputs.

Table 9.5. Model 2 Results.

		a) new products	b) new production processes	c) improvements in existing products
FACTORY SIZE				
Microsmall	Odds ratio	0.82	1.16	0.95
	Z-statistic	-1.29	-0.76	-0.35
Medium	Odds ratio	0.93	1.37	0.94
	Z-statistic	-0.45	-1.42	-0.36
FACTORY SECTOR				
Confecce	Odds ratio	0.70	1.03	0.92
	Z-statistic	(1.79)*	-0.10	-0.40
Bebalim	Odds ratio	0.77	0.83	0.78
	Z-statistic	-1.39	-0.80	-1.28
Qcpl	Odds ratio	1.18	1.14	1.03
	Z-statistic	-0.74	-0.48	-0.14
Furnwood	Odds ratio	0.79	1.08	0.92
	Z-statistic	-1.18	-0.30	-0.38
Leashoe	Odds ratio	1.16	4.41	1.47
	Z-statistic	-0.51	(2.91)**	-1.27
Nonmetal	Odds ratio	0.58	0.61	0.61
	Z-statistic	(2.51)**	(1.98)*	(2.20)*
Textile	Odds ratio	0.74	0.98	1.88
	Z-statistic	-1.03	-0.06	(2.01)*
A- INTERNAL NETWORKS - INTRA FIRM COOPERATION VARIABLES				
Forown	Odds ratio	0.77	1.20	0.96
	Z-statistic	-1.53	-0.78	-0.24
B- EXTERNAL NETWORK - INTER FIRM VARIABLES				
Forsubcont	Odds ratio	1.00	1.30	1.30
	Z-statistic	-0.01	-1.10	-1.50
Forlicen	Odds ratio	2.07	2.31	2.02
	Z-statistic	(2.14)*	-1.56	(2.09)*
Locsuppl	Odds ratio	0.97	0.94	1.48
	Z-statistic	-0.17	-0.32	(2.44)**
Loclic	Odds ratio	1.29	0.91	3.02
	Z-statistic	-0.49	-0.15	(1.90)*
Locclient	Odds ratio	1.81	1.43	1.53
	Z-statistic	(2.93)**	-1.26	(2.15)*
INSTITUTIONAL				
Locuniv	Odds ratio	2.42	2.17	3.72
	Z-statistic	(2.51)**	-1.44	(3.62)**
Locchamb	Odds ratio	1.19	2.69	0.86
	Z-statistic	-0.66	(2.09)*	-0.57
C- INNOVATION				
Newequip	Odds ratio	2.15	1.84	2.47
	Z-statistic	(7.13)**	(4.39)**	(8.24)**
humanK	Odds ratio	1.51	1.95	1.31
	Z-statistic	(3.80)**	(4.40)**	(2.41)**
D&A	Odds ratio	1.24	1.61	2.19
	Z-statistic	(1.84)*	(2.87)**	(6.69)**
Constant	Odds ratio	0.81	1.79	0.41
	Z-statistic	-0.93	(2.08)*	(3.76)**
Observations		1771	1771	1771

* Significant at 5% level

** Significant at 1% level

9.5.3 External network:

Inter firm network (Foreign): Factories with access to foreign technology through inter firm licensing (*forlicen*) have odds that are twice as high for the development of new products or for improvement of existing products as those that do not have access to this technology. Tough, only 3% of the surveyed firms purchased a foreign license, the impact on innovative outputs is quite significant. The other market channel to access to foreign technology was subcontracting, the results contradict the idea that foreign firms purchasing locally intermediate inputs and services would foster innovation through a package of upgrading efforts associated with the supply of inputs (Barba Navaretti and Venables, 2004 and Smarzycka, 2003).

Inter firm network (Local): the factories' relationships with other firms prove vital to develop improvements on existing products. Factories that acquired technology through cooperation with suppliers of machinery and equipment (*locsuppl*), collaboration with client firms (*locclient*) and local licensing (*loclic*) show odds 1.5 times higher of improving existing products than those factories that lacked those interactions. Additionally, the odds of creating new products are 1.8 times larger for factories that get hold of technology through interactions with clients.

Institutional networks: the model results suggest that factories with relationships with universities and public institutions (*locuniv*) have greater odds of creating new products and improvements of existing products than those factories without those interactions. Though the specific interaction activity has not been elucidated, it well may be that training provision and consulting are ways that universities and institutions foster innovation in local plants. Additionally, the third type of innovation output, a new production process is more likely if the factory has acquired its technology from interacting with local chambers of commerce (*locchamb*). The collaboration and learning from peers seems to be vital in the course of devising new production processes.

Innovation inputs: the most consistent and important drivers for all three innovation outputs are the inputs described by Kline and Rosenberg (1986). As Table 5 show, factories that engaged in development and adoption of technology (*D&A*), hiring new personnel (*humank*) and acquiring new machinery and equipment (*newequip*), show higher odds for the development of innovative outputs. The result stresses the importance of non-R&D inputs in the generation of innovation especially in low

technology industries. Moreover, in developing countries, adoption and adaptation of new technologies within the factory are primary channels for innovation rather than classical expenditures in R&D. The hiring of new personnel (*humank*), helps to absorb, use and adapt new technology and it is assumed that technological know-how is embodied in technical personnel (Griliches, 1969 and Nelson and Phelps, 1966). Finally, the acquisition of new machinery and equipment (*newequip*) embodies technological progress and represents a higher level of technology.

9.6 Part V- Conclusions and Public Policy Implications

First, the results suggest that policies designed to attract FDI in the four countries studied should take into account the innovation differences across sectors. As the analyses show, low technology manufacturing sectors with major relationships with foreign capital and with a big proportion of large factories are not necessarily more innovative. It well may be that the lack of innovation is related to enclave characteristics of foreign ownership, as it seems to be the case of the wearing apparel sector. On the contrary, the textile manufacturing sector has similar characteristics, but innovation seems to be more likely. In that sense policies designed to foster FDI should consider sectoral characteristics. Nevertheless, the classical optimal public policy approach, subsidies, place very stringent information requirements on policy, because the subsidy needs to be calibrated in a way that matches the value of the innovation outputs.

Second, despite the unclear role of foreign ownership in innovation, the results suggest that when local firms master foreign technology using licensing, innovation is more likely to occur. This is a market channel that proved to be essential in the catching up process of East Asian economies (Matthews, 2001)

Third, for low technology manufacturing sectors in the 4 countries studied, external networks are found to be important in the production of innovation outputs in inter-firm relationships as well as institutional relationships. Potential policies to help the creation of public private Institutional structures that foster coordination between the institutional network and firms (factories) as well as enhance adoption and accelerate diffusion of foreign technology that would increase innovation of local firms are desirable.

Finally, results on innovation inputs stress the importance not only of adaptation and development within the firm in generating innovative

outputs but the value of machinery and acquisition equipment and contracting new human capital. This is more relevant in the case of low technology manufacturing industries where learning by doing is an integral component for gaining incremental innovation.

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9.8 Annex I - Variable definitions

A- Firm Size		
Microsmall	1-25 permanent workers	
Medium	26-75 permanent workers	
B- Firm Sector		ISIC 3 (1)
Confecce	Wearing apparel and fur	18
Bebalim	Food products and beverages	15
Qcpl	Chemicals and chemical products	24
Furnwood	Wood & products of wood & cork, exc. Furniture	20
Leashoe	Leather and articles; footwear	19
Nonmetal	Other non-metallic mineral prod.	26
	Rubber and plastic products	25
Textile	Textiles	17
C- Internal (inter-firm) Networking		
Forown	10% or more of foreign capital main technology channel= technology from headquarters	
D- External Networking (intra-firm) Foreign		
Forlicen	main technology channel= foreign licenses	
Forsubcont	percentage of sales to MNCs>10%	
E- External Networking (intra-firm) Local		
Locsuppl	main technology channel= cooperation with local suppliers of machinery and equipment	
Locclient	main technology channel= cooperation with client firms	
Loclic	main technology channel= licensing from local firms	
F- External Networking - Institutional Local		
Locuniv	main technology channel= universities or public institutions	
Locchamb	main technology channel= from chamber of commerce	
G- Innovation Inputs		
D&A	main technology channel= developing/adapting technology within the firm	
Newequip	main technology channel= acquiring new machinery/equipment	
humanK	main technology channel= hiring new personnel or consultants	

Notes: (1) Industrial standard international classification

Source: <http://www.oecd.org/dataoecd/14/28/1936170.htm>

10. The Entrepreneurship - Development Nexus

Roger R. Stough

10.1 Introduction

This chapter offers some perspective on the entrepreneurship and development connection. Much of the literature has evolved around investigations taking place in and on developed economic systems¹ and particularly on ones with a market vs. a centrally planned orientation. As a consequence, the models and frameworks for studying entrepreneurship are for the most part patterned after what we know about venture formation and growth in developed contexts leaving of course the question of how appropriate these frames of reference are and what if any other models might be developed and perhaps be more or at least as appropriate. This chapter is an attempt to provide some guidance on these questions and issues.

Beyond these objectives, there is a broader question about why entrepreneurship has recently become relatively more important in relation to development that begs attention. In providing some answers insight can be provided into why entrepreneurship policy and programs have grown in popularity as one of the primary development tools used in both developed and developing economies. With this rising importance comes the basic question of how entrepreneurship can be applied as a tool to promote growth and development at the regional level especially in a development framework.

Further, the chapter recognizes that there has recently been a huge rise in the general importance of entrepreneurship in social, political and economic realms. This is supported by the fact that there has been considerable growth in the amount of scholarly and gray entrepreneurship

¹ Despite the effort to reduce the gap made by the papers and empirical analyses made in the chapters of this book.

literature. As impressive is the fact that there are 3 times as many university entrepreneurship programs in the U.S. today as in 1995, only some 12 years ago. This is both positive and problematic for inquiry into the entrepreneurship and development nexus. It is positive because it demonstrates that considerable effort is going into the task of learning more about the nature, causes and uses of entrepreneurship; it is a problem because the sheer volume of work has not been accompanied by a similar effort to build frameworks for integrating the findings and using the concept in a developmental context. Consequently, this Chapter attempts to address this issue and provide some framing concepts if not a full framework for organizing the literature, guiding research, advising policy and listing the major remaining research questions.

Finally, the Chapter presents two case studies, albeit brief, in an effort to illustrate how two emergent national economic systems are trying to use entrepreneurship in their development strategies and plans. One is China whose recent development history may be characterized as being of a more traditional stage type strategy (see Rostow, 1960) but, in anticipation of continued economic growth it has made development of advanced technical enterprises, growth companies and support for continuous competitive institutions a center piece of its strategy. The second is India whose development since decolonization seems to have been primarily stage oriented but recent history has focused on the IT sector. This has created an opportunity to adopt a new type of development strategy called the leapfrog model (see Thatchenkery and Stough, 2005). This means that innovative or productive type entrepreneurship has been largely but not exclusively focused in the IT sector. For the leap frog strategy to work, India will need to diffuse or spill entrepreneurship behavior over into other sectors as well as to continue to liberalize policies it adopted increasingly after 1989. Ironically, India faces unbalanced growth due to its sectoral bias in and around the IT industry; and, at the same time, China also faces an unbalanced situation due to a failure to diffuse or induce effective filtering down policies across a broad national geographical frame. Consequently, both economies face unbalanced growth where significant concern is being raised by their residents. Both are coping with increasing pressure to rapidly spread dynamic results to other parts of their economies in order to close broadly recognized development and equity gaps. Entrepreneurship is seen as a major vehicle for helping close the gap in both cases.

The Chapter is organized in several parts. The first provides a discussion on the nature of entrepreneurship and how it can or may vary across the developed – developing spectrum. The next explains why entrepreneurship has become increasingly popular in recent years and why it continues to

grow in stature as an important feature of local and regional economic development strategy in both developed and developing countries. Following this the third Part discusses the concept of an entrepreneurial economy which sets the stage for illustrating how developed and developing economies differ in terms of resources and other supporting attributes for promoting development of entrepreneurs and entrepreneurship. Part Four discusses and assesses some alternative frameworks for not only examining entrepreneurship in a developing country context but also for the setting of entrepreneurship strategies and policies. Illustrative case analyses of China and India are undertaken in Part five in an effort to illustrate some of the ways emergent and developing economies are trying to improve their ability to create productive or innovative entrepreneurship. The chapter ends with a summary and conclusions.

10.2 Defining Entrepreneurship in a Development Context

Entrepreneurship has been defined in quite some detail in earlier parts of the book so here it is examined only in a general way with one exception and that deals with a distinction between productive vs. unproductive entrepreneurship. This distinction is between entrepreneurial activity that is intended to promote venture growth development vs. that which results in the maintenance of a business activity. This distinction is important in considering the difference between entrepreneurship in developed vs. developing economies.

The definitions of entrepreneurship from the perspective of classical scholars (Schumpeter, 1947; and Kirzner, 1997) have been presented above in the Introduction and in several other chapters. What is important from that and subsequent research for this chapter is to observe that at the core of entrepreneurship is perception or discovery of a new opportunity and the ability to act on this information in forming and growing a company or business enterprise. These seem to be the core attributes of the concept other than issues dealing with how entrepreneurship fits into larger economic systems and thus contributes to destabilization of the economy (Schumpeter, 1947) or promotes its equilibration (Kirzner, 1997). Here, however, the focus is on the attributes of discovery, and the formation and growth of business enterprises.

Baumol (1990) and others (Sautet, 2005; and Coyne and Leeson, 2004) argue that entrepreneurship is of two types: productive and unproductive². Productive entrepreneurship aims to not only form a business venture but to also grow that venture and in the process create jobs and wealth. Unproductive entrepreneurship may lead to business (formal or informal) creation but is not dynamic and growth oriented.³ For example, the farmer who operates a vegetable stand or a lawn mower repair shop to supplement income from agricultural pursuits would, with this distinction, be viewed as pursuing unproductive entrepreneurship. Also, entrepreneurship in a traditional development context would most often be defined as unproductive entrepreneurship. The distinction that is made here is between growth and job/wealth creation vs. economic maintenance.

While this discussion has posited entrepreneurship as either productive or unproductive it is perhaps better to think of this classification as attempting to define the end points of a continuum with many degrees of productiveness and unproductiveness being possible. This idea is pursued below in more detail and in the case studies.

While the literature on entrepreneurship and development is limited, that which does exist argues that the institutional environment of a country or region influences the type of entrepreneurship that tends to exist and persist (see Sautet, 2005, Coyne and Leeson (2004); and, Boettke and Coyne, 2003). Where strong institutions such as protection of property rights, taxation regimes that favor the entrepreneur, defined legal institutions and the prevalence of the rule of law exist, and where business leaders and entrepreneurs are viewed positively the more likely productive entrepreneurship will occur and vice versa. Given that one of the problems developing countries face is transforming institutions that evolved out of traditional cultures and the early stages of development and thus are limited in their support of productive entrepreneurship, a major objective of development seems to require institutional change. Also, it is expected that developing countries will exhibit lower levels of productive entrepreneurship and higher levels of survival or unproductive

² Other terms that have been associated with this classification are opportunity and innovation entrepreneurship vs. survival, social, and necessity entrepreneurship.

³ In Baumol's earlier work productive entrepreneurship is positive wealth creating, including that created in non-pecuniary assets, externalities and convexities. Destructive entrepreneurship is that which actually destroys resources such as theft. In his 2007 book, the language is extended to activity which either creates new knowledge or wealth versus that which merely redistributes the wealth of society.

entrepreneurship (see Baumol, 1990). This is rather self evident given that significant institutional, financial (capitalization), knowledge and know how and technology barriers face the productive entrepreneur in poor and developing countries. This part of the paper of course begs for evidence that productive entrepreneurship is at base a catalytic driver of economic growth and development.

10.3 Entrepreneurship and Development in the Larger Context

The practice of economic development in developed countries favored business attraction (and retention) policies for much of the latter part of the 20th Century. This focused attention on providing incentives for businesses to move to or remain in a local region which usually reduced the cost of operations at that location below what they would have been at other locations. Incentives were the cornerstone of this policy and included provision of supporting infrastructure (e.g., road access to major highways, sewerage to business site development), tax holidays or rebates, and work force training. Two of the more celebrated examples in the U.S. were the decisions of Mercedes Benz to locate its first U.S. plant in Alabama and BMW to locate its first U.S. plant in Spartanburg, South Carolina. In both cases incentives worth hundreds of millions of dollars were granted to induce the businesses to locate where the largest incentive packages were offered. Despite research showing that on average some net benefits were produced from incentive policies (Bartik, 1991) business attraction and the related incentive policies came under increasing attack as the information or knowledge age evolved. As globalization and related transport and communication infrastructure unfolded many traditional manufacturing plants located in developed countries found more favorable production environments abroad where labor and other costs (e.g., taxes) were much lower. This meant that attracting plants in the low and mid range of manufacturing sophistication to support jobs and wealth creation became increasingly ineffective and obsolete. An alternative in the form of policies to support the growth of ventures and industries around industrial cluster concepts emerged (Porter, 1990) as an increasingly more important strategy for job and wealth creation (Stimson, Stough and Roberts, 2006; Karlsson, Johansson and Stough, 2006 and 2005). As this strategy became more accepted and in demand so did strategies and policies that promoted entrepreneurship. But this trend was not limited to the developing countries.

Beginning in the late 1980s it became increasingly clear to development students and practitioners that developed economies could no longer compete on the basis of wage or labor cost across a wide spectrum manufactured products. Thereafter most all except the more technically sophisticated products/processes moved to places where labor cost was lower, e.g., China, India, Viet Nam, Malaysia, Indonesia, Mexico. Today there are only certain kinds of productive activities that developed countries have a comparative advantage in: high end technological services, goods/services that must be locally produced, e.g., tourism tied to a local amenity or a product tied to a local resource, and products or services embedded in an industrial cluster where huge agglomeration economies are enjoyed due to the co-location of producer goods and services input chains. The one realm of manufactured product that may still be produced competitively in developed countries is that which is continuously innovated, i.e., a product that changes continuously as new innovations are made and thus cannot be re-engineered or copied. In short, one of the main reasons that business attraction strategy in developed countries has become less favored is because developed countries cannot compete on a wage cost basis.

Political change has also played a role in making entrepreneurship and business development strategies more attractive in developed (as well as developing) countries. The demise of the U.S.S.R. led to the opening up of huge markets in the last decade of the 20th Century that had been unavailable for decades. Further, the increasing awareness that liberalization policies were becoming essential for development led to increasingly more market supportive policies in a number of countries that previously had not supported market policies; most significantly the two largest countries in the world, China and India.

Globalization is another force that has contributed to a fading belief in business attraction development policies. The advance of globalization was not an independent force but overlapped heavily with the emergence of huge available pools of low cost labor in lesser developed countries, the increasing acceptance of liberalization policies, and by development of new transport and communication technologies that support a highly sophisticated global logistics infrastructure. This latter development enabled a reduction in transaction costs that would otherwise be far too high to support the degree of global economic interaction that has arisen in the past two decades.

These factors all bear some responsibility for the fading dominance of business attraction and incentive policies and the rise in importance of business and industry development policies and thus of entrepreneurship as central elements in current regional economic development policy. This is

not to say that attraction and incentive policy have disappeared but rather that their importance is less than a decade or so ago. Further, to the extent that an attraction and incentive policy exists it is often embedded in a framework that is tied to an industrial cluster strategy. Such strategies also include industry and firm development and thus entrepreneurship.

While this discussion has been focused primarily on developed economies it is also relevant for those that are less developed. Developing economies must operate in the face of the forces described above. They have their own wage/labor cost problems e.g., wage cost is considerably higher in Shanghai than in Wuhan or places further to the interior of China and given the large incentives to ventures that locate in the more interior parts of the country the forces that are driving businesses from developed countries are also driving them from the more developed parts of developing countries. Similarly, business actors in developing countries also must find ways to capitalize on political and policy changes and the increasing sophistication of transport, logistics and communication systems. All in all developing countries by default must increasingly focus policy on a business and industry development strategy than in the past. They can no longer rely just on wage cost competitiveness although this remains a distinct advantage. Consequently, entrepreneurship has become increasingly important as an element in policy in developing countries.

10.4 Frameworks for Development and Entrepreneurship

Various frameworks for thinking about the development-entrepreneurship interface exist but they tend to be highly detailed and nearly exhaustive on the one hand or so skeletal, on the other, as to omit some of the most critical factors in development. Herein some existing frameworks are reviewed and assessed, albeit somewhat superficially, and then their potential utility is summarized.

The Rostow (1960) concept of the stages of economic growth has been used for a long time and underlies much of the thinking about development even today. Rostow's thesis is that development progresses through several stages and at each stage the economy becomes more structurally sophisticated and sustainable. In short, it sees development as progressing from traditional resource and agrarian agriculture to innovative and technological sophistication in the final stage where sustained long run growth is maintained. While entrepreneurship has had modest or passing expression in this framework it is reasonable to extend a hypothesis that as the stages to a sustained advanced economy unfold entrepreneurship molts

from a focus on necessity or unproductive entrepreneurship to a stronger emphasis on productive entrepreneurship. Since Rostow's formulation there has been a continued theoretical argument about how the stages of development can be achieved. Many formulas or strategies have been proposed and tried but there is no definitive model⁴. None of the strategies used has put entrepreneurship at the heart of the model, until recently (Baumol, Litan and Schramm, 2007).

The Washington Consensus (WC) (Williamson, 1989) is a framework developed at the World Bank in the late 1980s that was highly influenced in its development by representatives from developed countries. The WC framework is a rather straight forward formulation that lays out a set of actions or conditions that stressed developing countries⁵ need to implement to reverse development drift and therefore make them more like developed countries. These are, after Williamson (1989):

1. Fiscal policy discipline
2. Reduction of public spending on indiscriminant subsidies
3. Tax reform
4. Maintain market determined interest rates
5. Instill competitive exchange rates
6. Impose trade liberalization
7. Liberalize inward FDI
8. Privatization of state enterprises
9. Deregulation – especially those that impede market entry or competition
10. Legal protection of property rights

The WC has been influential and many countries have tried to use it as a guide to both development strategies and tactics but with mixed success. A major problem with this model is not what is proposed but rather what is not specified or included. First, while the WC specifies what needs to be changed, the strategy for how to do it is left to policy makers. This is difficult given that most policy makers operate under stressful conditions that force them to simplify their decisions. The size and range of the WC guidelines are so great that it begs for simplification. But a simplified strategy is the chore left to the policy maker who must decide what parts of the WC are most important and most likely to be catalytic, and thus what should stand as the core of the development strategy. Second, a number of important elements were not addressed despite the length of the WC list.

⁴ See Stough, Haynes and Salazar, 2005 for a review of these theories.

⁵ The original focus was on Latin American countries that were experiencing considerable stress and development regress in the 1980s

These include but are not limited to an improved investment climate, reduction of transactions costs (red tape), institutional strengthening (e.g., judiciary), increasing use of direct cash transfers to address poverty, enhancing education (primary and secondary), improving effectiveness of development, absorption of technology⁶, adverse cultural norms and values, and political culture. The implied entrepreneurship hypothesis here in the WC context is that as a country makes progress toward the WC then entrepreneurship would increase and especially productive entrepreneurship, and thus development. Of course entrepreneurship is another attribute not addressed formally by the WC.

Another framework is offered by Baumol, Litan and Schramm (2007). These authors recognize that models like the WC with its ten point list, while not exhaustive, is still too extensive to enable policy makers and practitioners who function under short term constraints and intense pressure from competing stakeholders in the policy process to successfully implement development policy, except under the most exceptional circumstances. As a consequence, they attempt to offer a more limited set of elements that are to serve as the blueprint or strategy for a “well oiled growth machine” (p. 6). The Baumol, Litan and Schramm (2007, 7-8) framework has four elements. These are:

- Ease of forming a business
- Institutions that reward socially useful entrepreneurial activity, e.g., rule of law, property and contract rights
- Government needs to encourage activity that increases the size of the economic pie not divide it up
- Government needs to ensure that both larger established companies and successful entrepreneurs have incentives to innovate and grow, e.g., antitrust laws, openness to trade

The interest in this formulation is that entrepreneurship is the focus. The whole framework is focused on increasing entrepreneurship which in turn is expected to produce sustained economic growth. While this is more easily defended as an implementable framework that describes successful and sustained development, i.e., the successful entrepreneurial economy, it, like the WC, begs for recognition of a number of factors that are known or hypothesized to impact development. The authors recognize this and identify some of the leading candidate factors such as culture (as advocated by Landes, 2000), geography or physical environment (Sachs, 2005), education or human capital and democracy (political philosophy or system).

⁶ While Mexico has attracted considerable FDI to promote manufacturing in its border areas it has not been very successful at internalizing the related technology.

There is a need to consider these and perhaps other factors, such as various elements of neo-classical economics like labor, capital and technology in any framework for the study of the relationship between development and entrepreneurship. The entrepreneurship hypothesis in this framework is clearly demarcated and is more provocative than with the other frameworks as it implies that sustained development depends on entrepreneurship as the driver or catalyst, and that there are four conditions that determine the pace at which a country will experience entrepreneurial growth and thus development.

There is a final framework of interest and this focuses upon the nature of externalities that influence development and entrepreneurship. Virgill (2007) suggests that externalities that influence “entrepreneurship provide a useful framework to examine the literature on entrepreneurship in developing countries.”⁷ She suggests, based on a paper by Audretsch, Keilbach and Leimann (2006), three primary externalities (network, knowledge, and demonstration/failure) that provide a rationale for, on the one hand, public policy and, on the other, a framework for organizing the thinking on the relationship between development and entrepreneurship. An examination of these externalities follows.

Network externalities impact knowledge generation and transfer which are essential for entrepreneurship. Such generation and transfer (spillovers) are greater in highly concentrated and clustered business/industry clusters (Stough, Kulkarni and Pelinck (2002) and Acs (2002) and so tends to be entrepreneurship.

The **second externality is knowledge**. Because knowledge is a non-rival partially excluded good it tends to be underproduced (Audretsch, Keilbach and Leimann (2006). This is a central argument used in the U.S. to support government financing of R&D activities since the end of World War II and has driven the R&D pipeline concept that underlies this policy. Namely that pure research at the beginning of the pipeline will be underproduced because of its non-rival and potentially excludable attributes. Thus, given an assumption that the downstream part of R&D (i.e., technology transfer and commercialization) depends on pure research at the head of the pipeline, it follows that knowledge production needs to be subsidized to maximize commercial output at the end of the pipeline. The point here is that developing countries will tend to underproduce knowledge because of resource constraints and other priorities that are considered to be more important in economic maintenance.

⁷ Virgill, N. (2007) *The Effects of Trade Policy on Domestic Entrepreneurship in Developing Countries*, Ph.D. Field Statement, School of Public Policy, George Mason University, Fairfax, Virginia, page 19.

The third externality is **demonstration (or failure) effects**. Entrepreneurs like others learn from successes and failures regardless of the focus. So, entrepreneurs will learn from cases of new firm successes and/or failures. A controlling factor regarding demonstration/failure effects then has to do with ease of market entry, i.e., how easy it is to form a venture where an opportunity is perceived (Kirzner, 1997).

The externality framework offers an interesting alternative to the others examined so far. It is parsimonious and provides a rationale for considering the combination of development and entrepreneurship. The related entrepreneurship hypothesis is that development and entrepreneurship will be most advanced when the three externalities are most positive and vice versa. However, this framework is like that of Baumol, Litan and Schramm (2007) and thus is so parsimonious that critical elements in the literature may be omitted from consideration.

In the next part of the paper each of the frameworks is considered in an effort to offer some insight into their usefulness. This of course leaves the question of where policy makers should start in setting a strategy for development unanswered. The Baumol, Litan and Schramm (2006) formulation addresses this problem by assuming that by improving the entrepreneurial environment development will ensue. Thus they argue that improving entrepreneurship is a catalytic variable and they offer four objectives for achieving this. Virgill (2007) similarly provides three dimensions for improvement that will, if enhanced, enhance the climate for entrepreneurship and thus development. The problem with these simpler and more focused frameworks is that it is not clear that entrepreneurship is the critical catalyst to development despite informed arguments to the contrary (Schramm, 2007). Estimates of the contribution of entrepreneurship to economic growth by Audretsch and Keilbach (2005) and by Stough, Jackson, Song and Sutter (2007) both find that entrepreneurship's contribution to growth is positive but is relatively small (10-13 percent) compared to labor and capital. Admittedly however the time periods for these analyses were narrow (a few years) and the thesis that entrepreneurship is catalytic to growth and development is one that may be more valid in a longer time frame of analysis.

The stage model of economic growth is more historical in nature and hypothesizes that economies go through at least 5 stages of development. It is in this context that one might better find case studies that can be used to test, albeit anecdotally, the catalytic role that entrepreneurship is purported to play, e.g., the Taiwan develop story could be a case in point. Finally, the Washington Consensus is more inclusive of the various factors that have been considered to impact growth and development. It is noteworthy however that entrepreneurship and the climate for

entrepreneurship along with a number of other important factors identified in the literature are missing from the WC list.

10.5 A Synthesis of Frameworks?

So what is an appropriate framework? The answer of course depends on the purpose. If it is to provide a useful guide for policy makers then a relatively limited framework is needed and required. To achieve this a major assumption about the relationship between development and entrepreneurship is required, namely that entrepreneurship is the critical catalytic variable in the development process. But that is mostly a theoretical argument based ultimately on anecdotal evidence, interpretive analysis and historical example at this time. If on the other hand it is to help structure the literature or to provide a context for classifying the literature and what is known and not known, then the framework will need to be more definitive. Thus to achieve a full synthesis one is left with creating either an all inclusive multidimensional framework or one that is highly simplified which of course necessitates making assumptions that are yet to find fully supporting research results.

So what is the value of laying out these various frameworks? First, a more or less full coverage of the variables that may or may not be important for the investigation of the development-entrepreneurship interface is provided. This of course is probably of greatest value to researchers. Further, for such a framework to be of value an extensive review of the literature is needed to examine what is known or not known about the various hypotheses implied by the intersection of the variables that make up the different frameworks. Such an all inclusive literature review is lacking at this time. Second, it provides policy makers with at least two possible narrowly defined strategies for development both of which are based on the assumption that entrepreneurship is a critical catalytic variable if not the critical catalytic variable. But additional research is needed to under gird this assumption in order for it to be of real value to the policy maker.

In conclusion, the discussion returns to the entrepreneurship dimension and the idea of defining its end points as unproductive and productive entrepreneurship. While this construct offers a hypothesis that unproductive entrepreneurship is prevalent in poor or underdeveloped contexts and productive entrepreneurship is more prevalent in developed contexts, its validity is uncertain. For example, unproductive entrepreneurship has been called necessity, survival and replicative entrepreneurship; and

productive entrepreneurship has been called innovation, technology or growth entrepreneurship. It would seem however that these additional labels are not perfect synonyms. Thus, a more careful analysis is needed to see how strong the fidelity of the concepts of productive and unproductive entrepreneurship is for framing the relationship between development and entrepreneurship. For example, a farmer's sideline bird house business, for example, may provide an income supplement but is it necessity entrepreneurship in the same way that the peddler on the streets of Calcutta represents this end of the entrepreneurship spectrum? In short, the ends of the entrepreneurship dimension may be multidimensional and thus raise a question about the viability of this characterization. Despite this issue, the productive-unproductive dimension is employed below as a way to simplify the discussion, much as Baumol (1990) has.

Another question about the dichotomy of productive and unproductive entrepreneurship arises when one realizes that this is not a dichotomy but rather represents the end points of a continuum. Certainly one can find examples of productive entrepreneurship in the poorest of countries and of unproductive entrepreneurship in the most developed ones. The case studies that follow assume that the entrepreneurship dimension represents a continuum. Examples are provided in both the China and India cases that support the continuum argument.

10.6 Case Studies

Two cases studies, one of China and the other India, are presented in this part of the Chapter. The goal here is to illustrate the diverse range of entrepreneurial activity in both countries thus evidencing the thesis that both productive and unproductive entrepreneurship exist in these emergent economies and, further, to suggest that all countries have some of both. At the same time these cases also illustrate in part that learning how to accomplish productive entrepreneurship is a demanding learning exercise and that the evidence from these cases suggests that development and entrepreneurship are correlated along a dimension of productive and unproductive entrepreneurship, roughly defined.

10.6.1 China

China's development experience since the beginning of "opening up" in the 1970s is consistent with stage theory in that it first began by producing

manufacturing goods that required low skilled labor. At the same time it made major investments in infrastructure and foundation or basic industries, e.g., steel, plastics and other primary inputs to the manufacturing process. It then moved up the sophistication ladder to intermediate goods and now is investing heavily in education and skill development necessary for advanced technical production as well as heavily experimenting with the development of innovative enterprises and continuous innovation competitive strategies. While this story is an amazing one of how the largest country in the world emerged as an economic power over the course of 30 years or so from a generally elementary stage of development to the status of an emergent economy poised for sustained economic growth, there is not sufficient space here to do further justice to the China development experience over the past generation or so. Suffice it to observe that China comes close to fitting the classical stage model of development and it has implemented this in an incremental and experimental way as it has moved away from a centrally planned national economic system. In this context there are a diverse set of cases of productive and unproductive entrepreneurship as well as ones in both categories that have a variety of shades of meaning and significance.

Shenzhen is a planned city region of about 10 million people which had a population of about 200 thousand in the late 1980s! Today the majority of its population holds formal residence in another part of China and thus this large contingency of its population is considered to be transient. Shenzhen was populated beginning in the late 1980s with a new expanded round of “opening up” policies that enabled workers of all sorts to migrate to cities, seek work and start a business if desired. Today Shenzhen is the home of many entrepreneurs that range in type from unproductive to productive. For example, like in many other Chinese cities there are street vendors and peddlers that may be classified as unproductive. But at the same time there are many others whose ventures may be classified as productive or at least replicative and scalable. For example, a 19 year old coal miner in the west central part of China moved to Shenzhen in 1989. Upon arriving in Shenzhen he took a factory job but saved his money and within a year started his first business packaging goods from the Pearl River Valley⁸ for container shipping to foreign markets. As this business gained success he soon started another to provide overland transportation of goods to Shenzhen for export. Today he has started and operates more than 30 businesses with total annual gross revenue of more than \$400

⁸ Shenzhen is located near Hong Kong which is at the head of the Pear River Valley.

million U.S. There are many stories like this in Shenzhen as well as other parts of China including Shanghai, Tsingdao, Beijing, Harbin, Wuhan, Yantai and Wei Hei (located on the coast near Korea), Harbin located near the Siberian border, Urimuchi (located in the far west beyond Mongolia) most of which started with the liberalized migration laws that accompanied the late 1980s round of “opening up”.

The China case study began with Shenzhen because it is arguably one of the most if not the most entrepreneurial city in China at this time. Certainly Dung Yuan, Shanghai and Guangzhou, other large commercial centers in the Delta, could make the same claim but these developed much earlier than Shenzhen and thus have a different profile. For example, the author was involved in a training program for public servants/administrators in Shenzhen a few years ago and was startled to learn that almost every participant had a “sideline venture” and in some cases the sideline was a greater income earner than the public sector job. For example, one participant with a senior family member started a chain of Internet cafes. I joined him one evening for dinner in one of the three restaurants located in one of his cafés, a three story facility with what appeared to be about 500 users!

The examples presented so far have been to suggest that productive entrepreneurship exists in significant scale and quantity in China. At the same time that these grass roots programs were evolving and the rate of economic growth was rapidly growing, officials recognized that innovation was at the heart of sustained economic growth. Given that considerable resources were being built up as growth expanded, a policy to promote innovation and enterprise development was adopted. One part of this initiative was called the Torch Program which provided incentives to cities and provinces in China to establish technology incubation programs. These programs while receiving funding from central government sources were also augmented with local capital often coming from government sources (government itself and state owned enterprises – SOEs). The goal was to support the creation and growth of small but market sophisticated or technical companies in an effort to create innovative ventures that would grow into export competitive enterprises. The scale of this program was enormous by most standards. For example, the author was invited to visit the incubator in Qingdao, a city north of Shanghai on the coast with a population of about 4 million. Upon arriving there and driving up to the incubator he was looking at a building about the size of the U.S. Department of Commerce Building in downtown Washington, D. C. (about two full city blocks). The Qingdao incubator had over 600 companies in residence. Companies for the most part had a technology at the core of the business model including such technologies as ITC,

biotech, biomedical, materials and technical services. Officials in Qingdao were concerned however that the company success rate was low and thus were seeking ways to improve performance. From a demonstration externalities point of view it is worthwhile noting that one of China's most significant productive entrepreneurship ventures, the Haier Corporation (producing consumer durables) located in Qingdao, has become a transnational company with manufacturing facilities not only in China but also the U.S., Latin America, Europe and other parts of Asia. In short, the scale and intense interest in creating successful companies in Qingdao may have been in part motivated by success of the home grown Haier Corporation.

To illustrate the scale and geographic diversity of the Torch Program it is of interest to note that Wuhan, located in the east Central part of China, maintained 26 incubation facilities none of which was as large as that of Qingdao but the ones the author visited each had between 100 and 200 companies in residence! Again, officials were concerned with the low rate of success of their companies.

Torch program sponsored incubation facilities similar to those found in Qingdao and Wuhan exist in most urbanized parts of China. However, they are often linked directly or indirectly to science parks that are sponsored again through joint financing coming from the central government and local sources. These are found in Jinan (capital of Shandong Province), Shanghai, Beijing and other large metropolitan regions and often have a relationship with a local university and located proximal to it. Success in forming and growing successful technology companies in such facilities has, as noted above, been lower than desired. The low success rate problem does not seem to stem from a lack of education and related skills but rather from a lack of understanding of what it takes to create and/or enter a market for one's innovated product. In short, until recently these efforts at incubation of productive entrepreneurship lacked demonstrated successes and thus learning was constrained and often focused more on the failures than the successes. The Haier Corporation success in Qingdao is an exception in this regard and has helped to make Qingdao one of the more innovative regions in the country.

More recently city regions in China have begun ex patriot business development programs on the assumption that this would increase the chance of successful productive entrepreneurship, i.e., by importing knowledge and related talent and creating demonstration effects. Qingdao is a good case in point. Two years ago Qingdao created an incubator for ex patriot entrepreneurs. This facility provides free or subsidized space for Chinese from abroad who have been successful in technology venture formation and subsidies when, for example, Chinese trained engineers and

technical personnel are employed. A number of these operations have been underway for about 2 years and the preliminary success is much higher than in the earlier incubation programs. This is because the ex patriot entrepreneurs bring not only technical knowledge but also knowledge about the commercialization process in a market and global context to the task of creating and growing a company e.g., from the Valley, Austin Texas, the U.S. National Capital Region, Cambridge England and so on). In short, the ex patriot incubation program seems to be creating successes that are and will have a strong demonstration effect. As such, this will no doubt accelerate the development of productive entrepreneurship in China assuming changes such as liberalization of the banking system, support for advanced education and English language training is continued at its current level, and liberalized property rights law is continued.

It is important to note that with the Torch Program and related programs such as science parks that there has been no shortage of venture capital. However, venture capital in China does not mean the same thing as in the West because much of it has been in the form of government provided capital, e.g., the Innofund which is one of the largest public venture capital pools in the world accounting for nearly 30 percent or more of all venture capital provided to companies in China (Wang, 2006). This does not mean that Innofund type institutions are the only sources of VC in China. Clearly FDI is a major source given that China has received the largest amount of FDI in the world over the past few years (Cheng and Stough, 2006). Further, private venture capital sources form inside and outside of China have provided capital for Chinese companies, albeit ones more like the Haier Corporation than the smaller or riskier ones. Finally, local and provincial governments as well as SOEs also have provided venture capital. The default or failure rates have been high for Chinese companies in general and as noted for those that were in the incubation pools and thus China has maintained a high level of non-productive loans and assets. While this has been a problem in many other countries to the point of threatening the existence of banking systems, e.g., Indonesia and Thailand, this has not threatened China's system nor its rate of economic growth because the system is, for the most part, of the state and can be written off as long as there are sufficient capital reserves on hand and policy congruence that is supportive. The problem with this is that such investment is not subject to commercial or market forces and thus often ends up being non-productive as witnessed by the low rate of success for companies in China's many incubators.

In conclusion, what can be said about entrepreneurship in China? First, the discussion strongly suggests that demonstration externalities are very important as a country moves up the development ladder. Second, it shows

that knowledge capital and network externalities are also quite important. So the externalities framework seems to work for the China case. In a similar fashion so does the Baumol, Litan and Schramm (2007) four dimensional frame as nearly all of the four dimensions would receive a strong rating including on the availability of capital scale notwithstanding the fact that China has yet to fully privatize its banking as required as part of its joining of the WTO. Until this occurs inefficiency will continue in its efforts to stimulate productive entrepreneurship.

Finally, this initial case study has provided evidence of a range of entrepreneurial activity including unproductive and productive entrepreneurship. As such it provides evidence that countries' levels of entrepreneurship fall on a continuum ranging from unproductive to productive entrepreneurship.

10.6.2 India

India began its development trek following the end of British Colonial Rule in 1948 adopting a strategy that envisioned a stage process for its economic development but with strong central government steering and at the same time attention to cottage type industrial development at the village level in response to the popular Gandhian grass roots vision of economic development. The strategy adopted also envisioned a balanced vs. unbalanced growth philosophy. India's experience after decolonization was for decades one of marginal success with the annual GDP growth rate rarely rising above 3 percent. In the early 1990s this changed due to adoption of liberalized development policies, for example, various Washington Consensus elements were addressed at least in part at that time.

What is of great and special interest in India is that it has a well developed and globally competitive information technology (IT) services industry sector. This is not an expected outcome from a stage theoretic perspective and especially at the relatively early stage of India's economic development as such advanced industries are only expected to become competitive in the long term during the final stage, i.e., the push to sustained growth and development. This anomaly has led some development researchers to hypothesize an alternative to a staged process (Rostow, 1960) and pose what has been called the "leapfrog" model (Thatchenkery and Stough, 2005). The notion of a "leapfrog" model is that a country might be able to skip stages of the conventional process by rapidly driving the development of a technically advanced and potentially generic sector, like IT, and then diffusing the adoption of that technology

into other sectors thereby driving the development process unconventionally from the top down. And in this way, leapfrog at least some of the stages held as sequentially necessary in traditional development theory. Of course to do this India would need to effectively move IT relatively quickly into other sectors, e.g., agriculture, manufacturing, medicine, distribution and transport, wholesaling and producer services and so on. In this fashion change would be brought to the lagging sectors and thus force processes to change and productivity improvements to occur broadly throughout the economy. In sum, it may be argued that India unlike China faces an opportunity to test the leapfrog model in part or in total. In that event, entrepreneurs will be needed to drive the development of IT applications in the lagging sectors and thereby increase productivity in those sectors.

India's economy today may be classified as emergent on the one hand but on the other, much like China, it has huge numbers of people lodged in labor intensive agriculture and thus has a large portion of its population living in poor and underdeveloped conditions. Likewise there are considerable numbers that live in urban poverty as it is estimated that hundreds of millions live in poverty in India. Thus, it is not surprising that unproductive entrepreneurship is prevalent in both rural and urban settings. For example, peddlers of various low end goods and services abound in and along the streets of Indian cities where one even finds these entrepreneurs operating in the slow but slurry like flow of traffic in the congested streets of Calcutta, old Delhi, Mumbai and Chennai. Similar entrepreneurs exist in rural tribal settings doing business, along highways and in small villages. As implied by the entrepreneurship literature there is an abundance of such activity in all parts of India. But there is also considerable productive entrepreneurship.

As in China there is no reliable way to document the scale of productive or unproductive entrepreneurship so one must rely on interpretive analysis and anecdotal examples. First, some examples of relatively small scale productive entrepreneurship are presented to illustrate how grass roots type productive entrepreneurship can occur in India. Then emphasis is placed on the IT industry and larger scale entrepreneurial venture development and growth.

Perhaps the most illustrative way to introduce how small but scalable productive entrepreneurship occurs in India is to relate a story that was initiated in a presentation by the globally recognized business consultant Dr. C.K. Prahalad before a group of Indian businessmen and students. Prahalad observed that the cost of an ice cream cone was, say about 20 cents with the majority of the cost going to electricity needed to make the ice cream and to keep it frozen. Then he asked "what would the size of the

market in India be if the cost could be reduced to say 5 cents.” If the cost could be reduced considerably the market could be increased by hundreds of millions of ice cream cones and therefore rupees. Attendees were invited to seek this opportunity. Some left the presentation and pursued it. Later a hard packed salt lined box that could be snapped on the back of a bicycle and used to keep the ice cream frozen for a few hours was invented. With this a vendor could be sent off to sell ice cream cones from his bicycle. In this fashion it was possible to keep the ice cream in a solid state until sold and to reduce the transport cost to about zero. Thus a new huge and expanded market was created.

What is important about this example is that the innovation led to a large reduction in cost that opened up a vast market far beyond that which could be accessed with the traditional method of production and distribution. This type of productive entrepreneurship is typical of the Indian case as is illustrated in the next example.

Dr. Ashok Junjunwalla, a professor of information technology at the Indian Institute of Technology (ICT) at Chennai (Madras), in recognizing the large pool of the obsolete computer hardware that had built up in India had the idea that much of it could be used to bring the Internet and telephone services to remote villages in India and in a way that was not only self supporting but in fact would create new and sustainable ventures. The model Junjunwalla developed involved identifying a person in a village that had the basic skills to learn how to operate a crude Internet café type of service. Once this person or entrepreneur to be was identified he/she was provided with a loan to pay for the necessary equipment (a dumb terminal and communication software, etc. to link to the phone system and Internet) which cost about \$800 U.S. Junjunwalla and his colleagues helped set the equipment up and put the business model in place, selling connectivity to village residents again at a very low cost. Then the village IT entrepreneur was on his/her own (some back up support was provided by Junjunwalla and associates) to make the business grow. Two years ago a large percentage of the nearly 200 replications of this model were still operating successfully and had grown both in terms of numbers of users and in breadth of services. For example, one very enterprising owner acquired video capability for his business enabling residents to send pictures evidencing physical maladies, e.g., infections or compound fractures, to hospital and medical staff to obtain diagnostic and healing assistance. This business expanded to include providing the same kind of information to veterinarians for advice on how to heal or maintain the health of animals. This is another example of the creation of productive entrepreneurship by an innovation that greatly reduced the cost of a service to underresourced populations thus enabling them to acquire it. Again, a

new or expanded market was created, a signature method in India of innovation leading to productive entrepreneurship. These examples of productive entrepreneurship are interesting because they both involved new technology, albeit low level in the case of the salt lined box for preserving ice cream, and they both involved a new method of distribution.

Returning to the China example for a moment, one might characterize China's attempt to build the infrastructure to support productive entrepreneurship as over resourced. In contrast, India's efforts may best be described as being in a nascent stage of development and underresourced. For example, there are a few small government support programs like that operated by the National Science and Technology Entrepreneurship Board of India that provides assistance for the creation and initial growth and development of technology incubators in India. But taken as a whole the scale of these programs is miniscule compared to the effort in China⁹.

Further, there are some entrepreneurship assistance programs offered at some of the Indian Institutes of Technology (IITs) such as, for example, those at Chennai and Mumbai and at various of the Indian Institutes of Management (IIMs) such as the well known program at the IIM in Ahmedabad. Also, some of the private management institutes like the Management Development Institute (MDI) in Gurgaon (Delhi region), the Xavier Labor Relations Institute (XLRI) in Jamshedpur have programs aimed at helping start and grow new companies. Most of these focus on companies that have technology as a core element of the business plan and with ventures that are either faculty or student initiated and owned. These programs are often funded in part or totally by established companies in the Indian IT industry, for example, the technology enterprise development center at the IIT in Mumbai. Further, there are programs that aim to incentivise FDI and to promote intrapreneurship type programs of the SOEs either by investment from the SOEs themselves or through development banks such as the now defunct Industrial Finance Corporation of India (IFCI).

For the most part, productive entrepreneurship that has led to the growth and development of large and successful companies, especially in the IT industry like Wipro, Inc., have evolved out of resources provided by

⁹ The Indian Ministry of Small and Medium Enterprises announced early in August 2007 a plan to provide funding to universities and training institutes for creation of up to 100 incubators that will host about 1000 micro and small enterprises over the next five years. The program is in response to the recently enacted Parliamentary Small and Medium Enterprise Development Act. Despite this new program and a new policy emphasis on stimulating innovative entrepreneurship, it is still a relatively small program compared to those in China.

individuals or private sector sources. For sure, government policies that led to the development of high end engineering and business/management talent along with the global maturing of the Internet and IT services contributed to the development of successful companies in the IT sector. But for the most part this industry and the productive entrepreneurship that helped it grow stemmed from the effort of individuals and private sector institutions, not government supported programs. As a consequence, India is a very different case than China and one that appears to have provided minimal support for producing scalable productive entrepreneurship.

For sure there are some extraordinary stories about the rise of indigenous companies in India that today are global giants, e.g., Tata Steel and Birla Industries, and this discussion has given them short shrift. However, what seems to be important here is that government has been a relatively modest player or at least a background or hidden player in the development of productive entrepreneurship in India. This is not to say that government initiatives may have impacted the growth of such ventures indirectly or unintentionally but rather to say that it did not act in support of productive entrepreneurship in a transparent and active way and certainly was not so active a participant as in China. This of course would be expected given China's long history as a centrally planned economy that has only recently relaxed its control to incentivise the partial development and use of market principles.

The India case further substantiates that both productive and unproductive entrepreneurship exist significantly in this emerging economy and further substantiate the hypothesis that the productive-unproductive entrepreneurship concept is more of a continuum than the end points of a bi-polar distribution. Further, the India case shows that there is considerable variance in how the role of government in promoting entrepreneurship is defined and implemented. For sure, it is likely that such variance exists more broadly across the category of poor and developing countries.

10.7 Conclusions

So what can be concluded from this essay on development and entrepreneurship? First, early in the paper the concepts of the productive and unproductive entrepreneurship dichotomy were critiqued. It was argued that these endpoints are not uni-dimensional but multidimensional and thus beg for explication. Further, it was argued that rather than being a dichotomy these categories represent the end points of a continuum that on

the one hand offers a gradual qualitative gradation from one to the other and a gradual quantitative gradation from unproductive to productive entrepreneurship. For sure the case study evidence provided is ultimately little more than anecdotal and interpretive in nature. At the same time they do provide sufficient evidence that provokes the need for a closer examination of the hypotheses implied, namely, multi-dimensional categories and the notion that entrepreneurship is sorted along a productive and unproductive continuum rather than placed in the dichotomous end points of a bi-polar scale.

The attempt to find a consolidated framework to use for examining the literature on development and entrepreneurship was unsuccessful. Rather, one is left with several options: the Washington Consensus (WC), the Virgill (2007) externalities approach, the Baumol, Litan and Schramm, (2007) approach or an augmented WC model. As explained in the text, these models are useful but for different purposes.

Finally, the case studies do not do justice to the extraordinary range of efforts underway in such interesting and large scale cases as China and India. Only a few examples of entrepreneurial activities were provided. However, the cases did serve to show that the productive and unproductive dichotomy is more complex than implied in much of the literature. At the same time, more could be learned from a deeper analysis in both cases and with additional but similar analyses of countries further down the development scale.

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11. Democratic Capitalism and Philanthropy in a Global Economy

Sameeksha Desai and Zoltan J. Acs

11.1 Introduction

As socialism declined through the end of the 1900s, growing global acceptance acknowledged capitalism as the dominant political economy paradigm. It was also increasingly identified as a necessary condition and partner to democracy. Democratic capitalism refers to this system, which emerged as the victorious paradigm in the “modern” world. This meant that central questions related to political economy moved beyond justifying capitalism and associated philosophical questions (as was the case for the post Cold War world), and rather, to addressing its dynamics, management, implementation and effects.

With this in mind, possibly the most significant drawback¹ of the spread of democratic capitalism through the world has been its apparent magnifying effect on some social problems, particularly those related to inequality. Capitalism enables countries to position themselves within global markets, both through the added legitimacy of sharing the hegemonic political economy paradigm, and through real changes aimed at encouraging competition and innovation. Entrepreneurship is a particularly powerful channel for economic development in the economy. However, the central role of competition in capitalist economies creates conditions and outcomes, including market failures and negative externalities, which ultimately prevent all members of the population from accessing the benefits of a stronger economy².

¹ We are deliberate here to avoid the use of the term failure.

² We are careful to avoid labeling inequality as market failure. In the traditional sense, market failure is the existence of a non-Pareto efficient outcome – i.e., inefficient allocation of resources. Whether increased inequality qualifies as

These results, which we broadly label as social problems, do not build a case against capitalism but have been generally accepted as necessary evils of a global system of expanding wealth. Still, they need to be solved, as indicated by the pervasive and in some cases, growing inequalities around the world, particularly in new and recent market economies. Despite the rise of per capita income with technology investments and increased exports, the very poor stay poorer or worsen. Although it seems counterintuitive, the capitalist economy may be the ideal laboratory for solutions, as it embraces the spirit of innovation. When the market creates social problems, non-market solutions may alter or equalize them.

The response to social problems in many countries has been through legislative, regulatory or other government action. This has led to problems of dependence, such as social assistance for the unskilled unemployed in the Scandinavian welfare economies, and to problems of inefficiency, such as in the Indian education system, as we will see later. In many countries in the developing world, state solutions are crippled by poor funding resources for social issues, lack of technical ability to achieve adequate solutions, and in some cases, lack of government legitimacy. Given this, the ideal solutions for social problems must come from non-market and non-state sources.

In this paper, we take the position that the democratic capitalist system, which encourages entrepreneurship and innovation, is also the perfect environment to nurture equally innovative, non-market solutions to solve social problems efficiently. We argue that philanthropy, a social innovation born in the United States, has great potential to work in other countries. In the next section, we discuss the unique political economy of the United States, and how entrepreneurship and its resulting creation of wealth has led to a unique mechanism to reconstitute this wealth. We clarify how the relationship between entrepreneurship and philanthropy has been at the core of American economic strength.

11.2 Entrepreneurship and Philanthropy in the United States

The “entrepreneurial spirit” is credited with a great deal of economic success in the United States (Acs et al., 2007), particularly with respect to employment and income generation (Hebert and Link, 1989). As a result,

market failure is an empirical question and cannot be assumed to be Pareto inefficient.

entrepreneurship is promoted through policies (Hart, 2001) at different levels of government. It is not a coincidence, then, that an environment encouraging of entrepreneurship has also witnessed the creation of a major institutional innovation in the non-market realm: Philanthropy³. Philanthropy is increasingly recognized as a crucial contributor to the stability of American society and culture (Curti, 1957) and to the process of economic development. The relationship between entrepreneurship, the creation of wealth, and philanthropy, the reconstitution of wealth, has given the United States a self-sustaining cycle of growth and support that may explain its long term strength. This relationship differentiates the American political economy from other capitalist countries – notably Japan, France, Germany and the welfare economies of Scandinavia. Acs et al. (2007) present a detailed discussion of the roots of philanthropy in the United States and its resulting contributions to American entrepreneurial capitalism. American culture has been glorified and criticized in the same breath for its individualistic focus (Lipset). Regardless of the degree of centrality of the individual, it has maintained an implicit social contract to return wealth to society (Chernow, 1999). This social contract, shaped within an environment of property rights and individual liberty, has allowed for the development of important institutional innovations, including the foundation (Schramm, 2006). The reconstitution of wealth has served to expand opportunity (Acs and Dana, 2001) by building social institutions that enable future economic growth (Acs et al., 2007).

The entrepreneurship-philanthropy nexus, as defined by Acs and Phillips (2002) suggests that successful entrepreneurs become philanthropists, directing their wealth at building social institutions that create opportunities, thereby lead to economic growth. They do not address what we know to occur after the creation of opportunity has taken place: Entrepreneurship. We add to their model by “closing” it to create the Entrepreneurship-Philanthropy Cycle, which creates a self-sustaining cycle of wealth creation, social innovation and opportunity:

³ Although multiple definitions of philanthropy exist, we use a broad conceptual derivation from Acs et. al. (2006): *Philanthropy is giving money or equivalent to persons and institutions outside the family, without definite or immediate quid pro quo*. In this paper, we do not discuss the motivation to engage in philanthropy, which has been the subject of interest for economic theorists. The debate on motivation has focused largely on the impetus of self-interest versus altruism. For various perspectives on this debate, see Margolis (1982), Sugden (1982), Smith (1937, 1969), Boulding (1962), Kaufman (1963), Ireland (1969) and Simon (1993).

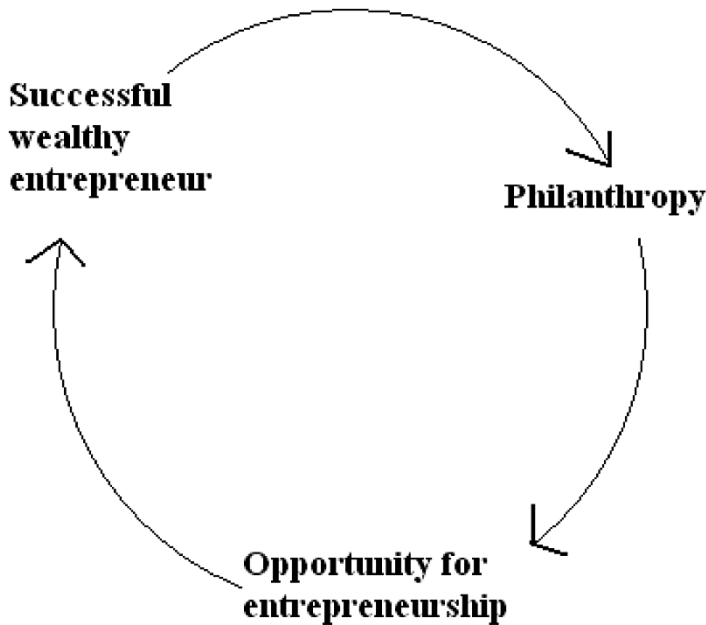


Fig. 11.1. The Entrepreneurship-Philanthropy Cycle.

In our model, the successful wealthy entrepreneur makes a philanthropic investment through a foundation, specifically aimed at alleviating a target social problem. The choice of this problem, i.e., donor intent, is a function of personal or experiential forces, perhaps based on the wealthy entrepreneur's own path to success, but the fundamental model holds.

The case of John D. Rockefeller, who gave back more than 95 % of his wealth and was one of the greatest philanthropists in world history, demonstrates this cycle⁴. The focus of his own philanthropic activity

⁴ Rockefeller grew up in Pennsylvania but was born in New York, and was the oldest child among several children (reportedly from multiple wives of his father). He had a religious mother and a father that served as a poor model for a male child. Rockefeller's father disappeared from the family home for long periods of time and did not provide steady financial support for the family. Rockefeller developed a distaste for his lifestyle and despite his poor family situation and lack of proper formal education – or because of it – Rockefeller began his first job at Hewitt and Tuttle in Cleveland, on September 26, 1855. He built Standard Oil and

appears to have been largely on education, but he embraced the idea that philanthropy is a dynamic and responsive mechanism that can tailor solutions to social problems. He said: “The best philanthropy is constantly in search of the finalities – a search for a cause, an attempt to cure evils at their source.” He established the Rockefeller Foundation in 1913 with the mission to promote the well-being of mankind throughout the world.

While it is unclear exactly what motivated Rockefeller to engage in such generous giving, and with such clear and organized strategy, it is clear that as a wealthy entrepreneur, his philanthropic efforts have created immeasurable opportunity, both in the United States and around the world. In his lifetime, Rockefeller established many important institutions, including Spelman College, University of Chicago, The General Education Board, National Bureau of Economic Research, Brookings Institution and the Rockefeller Foundation. Although the payoffs of his philanthropy cannot possibly be quantified, they certainly include all of the benefits of the University of Chicago, which has generated several Nobel Laureates, who have, in turn, worked on groundbreaking research in medicine and economics at the university. Further, the Rockefeller Foundation funded projects that led to the discovery of a vaccine for Yellow Fever, formulation of penicillin, and created programs in public health and medicine in the developing world (Sachs, 2000).

In our model, we do not attempt any quantification or even delineation of the benefits and types of opportunities that result from philanthropy. However, it is safe to say – at the very least – that entrepreneurship results from opportunity and improved social institutions. This closes the cycle.

11.2.1 A Note on Why Philanthropy Is Unique

We begin with the predominant paradigm of human relationships, typically divided along the lines of some trifecta of State, Market and Society. The idea of a non-market, non-state mechanism naturally falls within the Society arena, but this is often clouded by overlapping, sometimes misnomer terms like civil society, nongovernmental organization, charity, voluntary sector, third sector, etc. These terms blanket all channels for relationships that are not private or public, including intangible concepts like social capital and trust. Therefore, we separate Philanthropy as a distinct and unique term, but as a mechanism that still operates within the Society sector.

became one of the wealthiest men in the world, and retired to spend the rest of his years engaged in philanthropy.

The basic unit of analysis for philanthropy is the foundation, for which a clear theoretical framework has still not been established⁵ (Schramm, 2006). However, foundations are defined by specific legal status and can be distinguished from associations, companies, etc., in this manner. Foundations are unique because they are funded by endowments⁶, run independently by a board of directors and driven by donor intent (Nielsen; Schramm, 2006).

The foundation plays at least two clear critical roles: First, it provides a channel for wealth reconstitution and second, it acts an institutional entrepreneur (Schramm, 2006). Both functions are equally important and would other remain largely unfulfilled by other organizational forms in the Society sector. The first function – reconstitution of wealth – allows wealth to be used to tackle specific social problems, as defined by the donor. The second function – institutional entrepreneur – is achieved because of the independence of foundation funding, which allows these organizations to innovate and challenge other kinds of social institutions. This means that “foundations break the static equilibrium toward which social institutions gravitate (Schramm, 2006)” while still engaging in its own programs. Many foundations are established with fairly “open” missions, such as the Rockefeller Foundation (to promote well-being) that allow for responsiveness to new social problems as the world changes. In short, the foundation is always at the cutting-edge of social innovation.

One important additional function of the foundation is the provision of public goods. Where social problems are the result of a lack of public goods, such as those which provide health, education and personal security, foundations can help stem inequality of availability and access. Funding from the Bill and Melinda Gates Foundation in the health sector has contributed to the development of national-level health systems in some countries (Lele et al., 2007).

We must also clarify the distinction between charity and philanthropy. Both activities address Society, and both are aimed at what are ultimately the socially problematic effects of maldistribution of wealth (i.e., inequality in terms of income, education, access to housing, healthcare, etc.). The difference lies in the focus of activity. Charity focuses on immediate,

⁵ Perhaps the first reference to philanthropy as a distinct organizational form was by Carnegie (1889), who suggested that keeping ones wealth in a public trust to be administered to social benefit was preferable over bequeathing wealth to heirs.

⁶ Schramm (2006) notes that foundations are only marginally connected to the market through their endowments.

symptomatic social problems – for example, feeding large numbers of homeless people, providing shelter to refugees – and does not achieve mobility of people. Philanthropy, as noted by John D. Rockefeller, focuses instead on the root causes of social problems (see Schramm, 2006, for a discussion of how foundations evolved specifically with this purpose) and seeks solutions so they may affect fewer people in future generations. It seeks to create long-term improvement by empowering people, whereas charity tends to be more of “band-aid” and can create dependency. There are certainly differences in scale, but they are largely empirical and based on financial resources. Therefore, we maintain that the important difference between philanthropy and charity is in scope.

11.3 Globalizing the Model

11.3.1 Social Problems in Developing Countries: Need for Philanthropy

Prominent philanthropic efforts by “Western” donors have sharpened the focus of aid to developing countries. The focus of these efforts has largely been on creating and bolstering resources in the health and education sectors, which are often neglected by public and domestic market initiatives. Interest in philanthropy and economic development is growing, but very little scholarly work exists on this relationship outside the United States. In this section, we essentially extend the work of Acs et al. (2007) to an international perspective.

Let us briefly examine the state of the education sector in India, one of the world’s fastest growing economies. In addition, India has been aggressively promoting entrepreneurship, through its incentives and policy support for investment in high-tech industries and research. A great deal of employment has been generated through foreign direct investment and partnerships with domestic firms, including call centers that service many developed countries. Although government figures report improved education statistics, including literacy across categories, participation in higher education and enrolment, a closer look suggests that this sector, in itself, presents a social problem for the country. Public expenditure on education fell from an already low 3.7% per cent of GDP in 1991 to 3.3% of GDP in 2002-2004. In 2006, the poorest 10% of the population held only 3.9 per cent share of income or expenditure (UNDP, 2006). In a country where 98% of rural parents would like to send their children to

school (PROBE, 1999), a history of poor government provision of education and exclusionary private schools has led to the growth of “other” educational institutions. Although this appears to be a way around the problem of access, the initial result was unregistered, unregulated and sometimes unsafe environments that did not necessarily offer more than government-run schools (see PROBE, 1999). As the middle class has gained spending power and the rich have become richer, they have been able to send their children to good private schools. However, the poor and especially the rural poor do not have market access or public access to proper education facilities, even though some private schools are “aided” or subsidized. The poor state of educational facilities in India has been the conclusion of several studies on both the public and private provision of educational services⁷. The state of the education sector in India is clear evidence that in one of the world’s most promising emerging economies, there has been a colossal failure on part of both the market (private) and government (public) to provide education. This failure has potentially disastrous consequences not only for future economic growth, but for the future human condition in India.

Social problems in the developing world are deeply entrenched and compounded by lack of knowledge, lack of resources and lack of priority. Many developed countries face the further disadvantage of an unfavorable political economy environment – that is, inadequate market structures are compounded by a weak public sector. Global institutions are weak (Soros, 1998), and global problems are crossing borders and gaining strength. Philanthropy, then, offers the ideal mechanism for change.

11.3.2 Cultural Bias?

This brings us, naturally, to the question of cultural bias. Is philanthropy yet another Western institution to be unrealistically imposed on the developing world? The roots of philanthropy in the United States are said to lie in its distinct religious history, from which both social contract and social responsibility emerged⁸. Does this, then, pose an insurmountable challenge to replicating the American model of philanthropy in other countries? If we were proposing that this be done exactly and precisely as in the United States: Yes. But a general push for philanthropic activity, tailored to the policy framework and unique social problems from other

⁷ See PROBE (1999), De et al. (2002) and Aggarwal (2000)

⁸ See Acs et al. (2007) for a detailed discussion of the history and origin of American philanthropy.

countries? No. The international development community has learned, painfully, that cutting and pasting what works in one country does not work in others. Rather, we suggest that international, regional and indigenous philanthropy models can be designed based on a successful idea. There is already a rise in internationally-focused philanthropic activity, as indicated by the growing involvement of major US-based foundations in developing countries.

There does not currently exist a robust and effective local philanthropy sector in many developing countries. This does mean that it cannot or should not be built – and it does not mean such a sector will not work. Schramm (2006) notes the foundation was a necessary invention, and it was an institutional response in an evolving country seeking better solutions to its problems. The lack of foundations in developing countries is exactly the reason to encourage the growth of such a sector. In addition, the existence of other organizational forms in the Society sector is evidence that people recognize the need to address social problems, and that action is already been taken. The sheer number of nongovernmental organizations and nonprofits in developing countries, though often funded by governments and government aid agencies, indicates that the existence of innovative, creative approaches to social problems. However, these agencies suffer from lack of resources, coordination and worse, insecure resources due to sometimes whimsical funding decisions, often determined by changes in leadership. They do not have the mission effectiveness, financial sustainability, independence of donor intent or organizational sustainability that are generalizable for foundations.

As countries are gaining wealth through globalization and the deepening of democratic capitalism, so are their citizens better able to engage in philanthropic giving. In the same manner, as the spirit of entrepreneurship diffuses across countries, so too will an environment more generally nurturing of innovation in other arenas. For this reason, there is every possibility that our model of entrepreneurship and philanthropy, two forces strengthened by democratic capitalism, can create a cycle of social innovation and economic opportunity.

11.3.3 Globalizing philanthropy: Future Directions

We identify two contexts with respect to the idea of “globalizing philanthropy” to developing countries. The first context is that of internationalization, i.e., expanding programs for global focus and international activities of existing (and future) foundations. The second context is that of encouraging domestic philanthropy, i.e., encouraging the

establishment of foundations in developing countries with local sources of wealth.

The first context, internationalization, refers primarily to furthering the activities of US-based foundations in other countries. Large foundations are already engaged in the developing world, notably the Soros Foundation (Open Society Institute), Bill and Melinda Gates Foundation, Rockefeller Foundation, Ford Foundation, MacArthur Foundation and Turner Foundation. Most of their efforts have been in the education and health sectors, followed by technical assistance and institutional infrastructure support. They have been involved in their own projects and grant-making efforts, as well as in institutional innovations that challenge other social organizations. For example, the Bill and Melinda Gates Foundation, in addition to sponsoring its own health initiative across many developing countries, has also pledged \$ 650 million to the Global Fund to Fight AIDS, Tuberculosis and Malaria. The Fund is perhaps the newest social innovation adaptation, and integrates a range of funding sources in a massive fight against three deadly third world diseases. Through its involvement with The Fund and its own programs, the Bill and Melinda Gates Foundation is achieving both functions of philanthropy discussed in the previous section (Schramm, 2006).

The major challenge for internationalization is the current policy context in the United States. As noted by Schramm (2006), vested interests, political interests and increased legal and regulatory complexities are threatening the foundation in the United States. Such problems erode independence, particularly when policy begins to treat foundations as a quasi-government service providers, contractors, etc. This is indeed a very real danger in the United States, where the federal contracting model encourages outsourcing of government functions across industries and purposes. Social services at the state and county level are already being carried out by nonprofits and nongovernmental organizations, and it is critically important to prevent this from happening with foundations. At their very core, foundations are driven by donor intent, and operate successfully because they are non-market and non-state in nature; to tamper with this would surely sacrifice their effectiveness.

The second context, encouraging domestic philanthropy, is more complicated because it requires several things, some of which imply a paradigmatic shift in the responsibility of people to Society. It means that people must first buy into the idea of solving social problems, which requires vision and perhaps a specific personal configuration based on wealth and culture. Once people recognize that social problems should be addressed, they must then believe that it is, in fact, possible to solve them. The next step is the biggest challenge: Why philanthropy, over other

organizational forms in Society including traditional charities and other local mechanisms? This is not to say that because developing countries are poor, their populations are not engaged in any kind of social development at all. First, only a small handful of wealthy individuals are needed to create foundations with endowments, and such individuals exist across societies, regardless of per capita income. Unlike charities, which are more likely to be supported by large numbers of people giving modest donations, foundations come into existence because of one individual and a large endowment. Second, all societies appear to have developed coping mechanisms of some kind to address social problems like hunger, poverty, illiteracy, inequality⁹.

We do not intend to discount these efforts – certainly immediate and short-term community support is necessary – we merely suggest that the foundation model may be effectively able to *solve* some of these social problems. We consider various forms of charity useful and important from a humanitarian perspective, but long term mobility and improvement come from addressing the underlying causes of social problems. Ideally, treating existing problems and attempting to resolve them should occur simultaneously. Despite evolving as a uniquely American institution, the foundation can be adapted for other political economy contexts because it is contextually responsive. The nature of political economy constraints on institutional activities in developing countries can undermine efforts by actors within states or markets. The foundation is not dependent upon government legitimacy or market profile, both of which can be unreliable in developing countries¹⁰. In fact, country-centered assistance is not enough to fix development problems (Lele et al., 2007) – one important possible factor is because government structures often lack legitimacy and the trust of citizens.

⁹ For example, the idea of *Seva* (community service) in the Sikh religion means that Gurdwaras host free kitchens for the hungry in the community. The idea of fairness encourages Jews to engage in *Tzedakah* – giving to the community poor. Observant Muslims with adequate financial means are expected donate a portion of their income to community charity. Aside from religious mechanisms to address social problems, there are countless regional and local civil society organizations engaged in community service and community development activities.

¹⁰ For this reason, foundations offer additional promise in developing countries marked by failing markets and failing governments. For example, the Soros Foundation / Open Society Institute has been working in areas of instability or former conflict across Eastern Europe, the Middle East and Africa.

11.4 Conclusion

There is already a growing trend for private donors and philanthropies to become involved in developing countries (see Lele et al., 2007, for discussion of private initiatives in health, including the Vaccine Fund of the Gates Foundation, President Clinton's Global Development initiative, etc.)

It is premature to offer policy insight at this point, or advice on how to make this series of changes occur in developing countries. The purpose of this paper has been to highlight the function of philanthropy in solving social problems, and suggest a framework to understand how this occurs. We present the two contexts to introduce possible directions for philanthropy in the globalizing world, both as a new theme for scholarly research and as suggestion for policy research.

Visionaries even before Carnegie – who wrote of the “responsibility of wealth” – were concerned with how to gain and then appropriately use their wealth (Wren, 1986). It appears many more people will be faced with this question as the overall wealth of the world grows with the spread of democratic capitalism. This political economy paradigm does not appear to be slowing down. In addition to participating in international export markets, developing countries interested in loans and development grants face regulatory pressures to open their markets, privatize industries, and standardize along a long list of favored practices by international organization. This means that entrepreneurship and the growth of small and medium enterprises around the world is likely to escalate, leading further to the creation of jobs and wealth. As the world gets richer, its people become better able to take care of those that globalization neglects. Democratic capitalism, as it moves people and capital, also moves ideas. By moving the philanthropy model across countries, it may be better able to sustain its own growth, by taking care of those it has overlooked.

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