Trade Competitiveness in ASEAN

Dr. P R Bhatt*

According to Michael Porter (1990) a nation's competitiveness depends on the capacity of its industry to innovate and upgrade the technology. The policy of management of exchange rate, interest rate and trade may not be able to promote national competitiveness. He asserted that it was difficult to define national competitiveness. The only meaningful concept of competitiveness at national level is productivity. Productivity is the value of the output produced by a unit of labour or capital. Competitiveness at national level is to understand the determinants of productivity and the rate of productivity growth. Again the focus should be not on the economy as a whole but on specific industries and industry segments.

Porter (1990) discussed four determinants of competitiveness in his model of Diamond of National Competitive Advantage. They are:

- Factor conditions: the nation's positions in factors of production such as skilled labour or infrastructure, necessary to compete in a given industry.
- Demand conditions: The nature of home market demand for the industry's product and services.
- Related and supporting industries: the presence or absence in the nation of supplier industries and other related industries that are internationally competitive.
- Firm strategy, structure and rivalry: the condition in the nation governing how companies are created, organized and managed as well as the nature of domestic rivalry.

These determinants create the national environment in which companies are born and compete.

Factor conditions:

According to classical economists Adam smith and David Ricardo, a nation will export those goods that make most use of the factors with which it is relatively well endowed.

But in the sophisticated industries that form the backbone of any advanced economy, a nation does not **inherit** but instead creates the most important factors of production such as skilled human resources or a scientific base. Moreover, the stock of factors that a nation enjoys at a particular time is less important than the rate and efficiency with which it creates, upgrade and deploys them in particular industries.

Demand conditions:

Nation gains competitive advantage in industries where the home demand gives their companies a clearer or earlier picture of emerging buyer needs and where demanding buyers pressures companies to innovate faster and achieve more sophisticated competitive advantages than foreign rivals. Sophisticated competitive home based suppliers create advantage in down stream industries in several ways. They deliver the most cost-effective inputs in an efficient, early, rapid way.

Companies have the opportunities to influence their suppliers' technical efforts and can serve as sites for R&D work, accelerating the pace of innovation. The nations' companies benefits most when the suppliers are global competitors.

Firm strategy, structure and rivalry:

Competitiveness in a country depends on how companies are created organized and managed as well as the nature of domestic rivalry. Domestic rivalry creates pressure on companies to innovate and improve. Local rivals push each other to lower costs, improve quality and services and create new products and processes. When there are economies of scale, local competitors force each other to look outward to foreign markets to capture greater efficiency and higher profitability.

****Professor, Indian Institute of Management, Kozhikode. E-mail: prbhatt@iimk.ac.in***

Measures of Trade Competitiveness

Competitiveness may be defined as the advantage in price, quality, product design, reliability, salesmanship, delivery times, after sales service, etc. While elements of non-price competitiveness have an important effect on the volume of trade, this paper concentrated only on price competitiveness. Non-price competitiveness is intangible and difficult to measure. There is no single comprehensive index to measure price competitiveness because of the variety of contributing factors.

However, there are many indices available to measure the price competitiveness such as :

(a) relative export prices (EPI),
(b) relative wholesale price (WPI),
(c) profitability of exports (PEI),
(d) relative profitability of exports (RPEI), and
(e) index of import price competitiveness (TPI).

Relative export price (EPI) is the ratio of the unit value index of exports of India to a weighted average of unit price index of exports of its competitors.

The index of relative wholesale prices (WPI) is India's wholesale price index divided by a weighted average of the indices of its competitors' wholesale prices. This index may act as a useful proxy for domestic costs.

The index of profitability of exports (PEI) is the ratio of India's export unit value to its wholesale price index.

The assumption behind this measure is that higher the export prices relative to wholesale prices, more likely that producers will export rather than sell in the domestic market. The ratio suffers from the drawback that wholesale prices refer to current production while export prices are at the customs post and thus refer to production at some time in the past. The wholesale price index incorporates some indirect taxes and is generally considered a poor proxy for the incentive to produce for the domestic market. Nevertheless, this index of competitiveness is attractive since data are readily available and no information on other countries is needed.

The index of relative profitability (RPEI) is profitability index of India divided by weighted profitability index of her competitors.

The index of import price competitiveness is India's wholesale price index divided by its unit value index of imports. This index measures the competitiveness of import substitutes.

While constructing the index of relative export prices, we have used the unit value index of overall exports of India. It would have been more meaningful if it is confined to only exports of manufacturing goods. Since the unit value index of exports of manufacturing goods are not readily available separately for developing countries, we have used the unit value index of overall exports.

The competitive index worked out for countries in this paper are India, Indonesia, Malaysia, Philippines, Singapore, and Thailand.

The major export marketing centres considered are: US, Japan, Canada, Germany, France, Italy, Netherlands, UK, Australia, Switzerland, UAE, Korea

The weight given to each competitors of India for averaging purpose was calculated from the formulae given by :

$$W_j = \sum_k \frac{X_{ik}}{100} \times \frac{Y_{jk}}{100}$$

where W_j is the weight of j^{th} country, X_{ik} is the export share of India to k^{th} country, Y_{jk} is the export share of j^{th} country to k^{th} country, in the total exports of all countries, i is India, j is India's main competitors, and k is India's major export marketing centres.

The weight given to each competitors of India reflected the relative importance of that country in India's overseas markets weighted by the importance of the market to India.

The weights assigned to each competitor were given in the Appendix Table.
Data used for the study were taken from IMF, *International Financial Statistics,* Annual.
The five indices of trade competitiveness of all countries are presented in Table 3 and Exhibits 1 to 5.
The relative export price index (EPI) of India below 100 indicates more competitiveness of exports compared to its competitors and above 100 indicates less competitiveness of exports. It can be seen from Table 1 and Exhibit 1 that India's exports were more competitive during 1993-97 and 2004 whereas for Indonesia exports were competitive during 1990-1994, 1997-1999 and 2001. Philippines has gained competitiveness since 2001. In the case of Singapore they have become competitive since 2002. Thailand was competitive during 1990-1997 and 2001-2002. Among ASEAN countries Thailand have enjoyed competitiveness compared to other countries.

The relative wholesale price index of India (WPI) below 100 indicates more competitiveness in domestic cost of production of exports and above 100 indicates less competitiveness. Here we have taken wholesale price index as a proxy for domestic cost of production of exports. It is found in Table 2 and Exhibit 2 that domestic cost of production of exports of Indonesia and Philippines were competitive during the period 1990-1999 and lost competitiveness after that. Singapore started enjoying competitiveness during 1998-2004. Thailand and Malaysia became competitive during 2001-04. In the case of India immediately after liberalization competitiveness in terms of wholesale price index have improved but started falling since 1999.

The profitability index (PEI) above 100 indicate more profitability and below 100 less profitability. It is seen from Table 3 and Exhibit 3, that exports remained relatively less profitable during 1990-1998 for Indonesia, Philippines and Singapore. In the case of Thailand, exports were profitable during 1993-1996 and 2001-2004. Exports have been profitable for India since 2001.

The relative profitability index (RPEI) above 100 indicate that India's profitability is better than that of its competitors. It can be seen from Table 4 that India's export profitability compared to its competitors improved very much during 1993-1998. Singapore and Thailand have enjoyed relative profitability during 1990-1996 and Philippines during 2001-04. In the case of Indonesia, relative exports profitability was highly unfavorable during 1990-1997.

The index of import competitiveness (TPI) below 100 indicates more competitiveness of imports and above 100 indicates less competitiveness of imports. For India imports were more competitive during 1993-2001. In the case of Philippines imports were more competitive during 2001-2004. For Singapore, it was competitive during 1990-92 and during 1998-2004. Thailand was competitive in terms of imports during 1990-1997.

Trade Competitiveness and Exchange Rate Policy

A regression analysis was carried out to examine the impact of exchange rate on trade competitiveness. Each competitive measures mentioned earlier are regressed on nominal effective exchange rate (NEER), real effective exchange rate (REER) and bilateral exchange rates.

The REER takes into account the effect of relative price changes on the nominal effective exchange rate. The nominal effective exchange rate (NEER) represents the price of a representative basket of a foreign currencies each weighted by its importance to respective countries in international trade.

The NEER and REER for the period 1990-2004 were presented in Table 6.
The regression analysis was also done by taking changes in variable over the previous year. The result of regression analysis is presented in Table 5 and Table 6

It can be seen in Table 9 that bilateral exchange of Indonesia had an impact on trade competitive index such as WPI, PI, and RPI. However bilateral exchange has no influence on EPI.
In the case of Malaysia REER and bilateral exchange rate has no influence on WPI the only index available for Malaysia (Table 10).
In the case of Philippines, REER and NEER have significant impact on the trade competitive index such as EPI, IPI, PI, and RPI but has no influence on WPI. (Table 11)
REER and NEER have no effect on any of the competitive index in the case of Singapore. (Table 12)

REER and NEER are not readily available for Thailand and hence bilateral exchange rate was used to analyze the impact of exchange rate on trade competitiveness. It is found from the table that bilateral exchange rate has significant impact on EPI, IPI, WPI and RPI (Table 13).

It can be seen in Table that NEER and REER has no significant impact on any of the competitive indexes in the case of India(Table 14).

Table 1: Table Relative Export Price index of major ASEAN countries and India

Year	India	Indonesia	Philippines	Singapore	Thailand	Malaysia
1990	112.7	82.4	128.1	108.5	84.5	
1991	108.9	83.3	128.2	107.7	88.8	
1992	109.2	82.5	129.6	106.5	91.7	
1993	79.2	96.8	145.5	135.0	64.6	
1994	81.0	93.7	146.5	134.9	65.3	
1995	75.2	102.1	141.9	133.3	67.0	
1996	74.9	104.9	143.2	123.6	72.6	
1997	87.7	97.7	130.1	108.7	88.5	
1998	100.8	79.8	108.0	99.4	115.7	
1999	105.4	65.3	133.5	104.7	103.6	
2000	100.0	100.0	100.0	100.0	100.0	
2001	111.3	98.6	90.4	102.9	92.5	
2002	110.3	105.5	81.7	98.8	97.0	
2003	106.0	111.2	79.3	93.4	103.2	
2004	99.5	127.0	74.9	90.7	103.3	

Table 2. Relative Whole Sale Price Index of major ASEAN countries and India

Year	India	Indonesia	Philippines	Singapore	Thailand	Malaysia
1990	61.2	31.7	75.6	188.0	97.6	106.9
1991	70.6	32.9	88.5	169.4	104.4	108.4
1992	81.5	34.6	93.0	159.2	106.3	111.2
1993	89.7	36.2	89.8	150.5	106.2	113.5
1994	95.8	37.0	89.3	139.8	105.3	113.4
1995	100.0	39.5	88.5	129.1	109.0	113.8
1996	103.4	41.9	90.5	126.0	109.3	114.8
1997	106.9	44.9	91.7	120.1	113.6	116.0
1998	99.0	86.0	89.8	96.0	112.7	112.3
1999	101.0	94.9	95.0	96.9	104.1	105.6
2000	100.0	100.0	100.0	100.0	100.0	100.0
2001	101.4	115.7	114.4	93.3	98.7	89.7
2002	101.7	120.4	114.9	88.8	97.7	91.8
2003	103.9	117.4	120.3	86.9	98.2	94.2
2004	104.6	115.5	121.7	85.6	98.7	97.5

Table 3: Profitability of Exports of major ASEAN countries and India

Year	India	Indonesia	Philippines	Singapore	Thailand	Malaysia
1990	253.8	369.2	250.1	108.5	137.0	
1991	217.2	354.0	213.6	112.3	132.9	
1992	194.3	334.2	207.5	116.3	135.4	
1993	117.1	314.9	204.2	119.9	86.9	
1994	110.0	296.1	202.2	122.1	85.9	
1995	99.4	304.1	200.7	129.3	86.0	
1996	98.8	297.8	200.7	128.7	93.5	
1997	109.7	259.6	179.0	121.7	106.0	
1998	108.0	100.4	125.9	109.2	108.4	
1999	103.3	73.0	135.4	105.9	100.0	
2000	100.0	100.0	100.0	100.0	100.0	
2001	94.5	76.8	70.8	94.0	83.6	
2002	92.1	76.9	63.0	93.3	86.0	
2003	87.4	81.4	58.3	90.7	89.2	
2004	82.0	90.9	54.2	89.1	87.9	

Table 4: Relative Profitability of exports of major ASEAN countries and India

Year	India	Indonesia	Philippines	Singapore	Thailand	Malaysia
1990	149.3	237.5	131.0	45.1	65.9	
1991	125.8	241.8	115.8	50.2	66.8	
1992	109.8	232.3	113.6	53.3	69.0	
1993	71.9	267.8	131.6	66.5	49.3	
1994	70.2	253.1	136.7	72.7	51.7	
1995	63.1	257.6	134.3	78.0	51.6	
1996	61.1	248.1	133.8	76.0	56.2	
1997	70.8	214.5	122.9	74.0	67.2	
1998	99.4	90.7	117.6	100.6	99.5	
1999	103.1	67.9	139.0	106.6	98.1	
2000	100.0	100.0	100.0	100.0	100.0	
2001	111.5	86.4	80.3	113.6	95.3	
2002	109.3	88.1	71.7	114.2	100.2	
2003	102.2	94.6	66.3	109.8	105.7	
2004	94.8	108.9	61.6	107.8	104.6	

Table 5: Relative Import Price index of major ASEAN countries and India

Year	India	Indonesia	Philippines	Singapore	Thailand	Malaysia
1990	141.4		182.7	83.8	68.3	
1991	121.3		184.7	88.5	73.8	
1992	108.2		221.1	87.7	72.2	
1993	72.8		210.2	134.9	54.2	
1994	70.0		208.5	138.6	53.9	
1995	71.7		191.9	139.7	57.3	
1996	78.1		189.9	124.1	62.6	
1997	79.5		171.7	108.7	77.8	
1998	84.9		128.6	94.0	106.5	
1999	96.7		127.7	96.4	92.6	
2000	100.0		100.0	100.0	100.0	
2001	97.9		76.3	91.5	125.6	
2002	112.8		80.3	90.8	109.7	
2003	108.8		78.3	92.0	111.3	
2004	101.9		74.5	91.8	119.5	

Table 6: Nominal effective exchange rate of major ASEAN countries(base 2000=100)

Year	Malaysia	Philippines	Singapore	India
1990	113.4	135.4	83.9	105.6
1991	112.4	122.3	87.7	85.8
1992	121.4	134.5	90.6	75.1
1993	125.9	135.4	92	67.8
1994	125	144.9	95	67.2
1995	124.9	143.3	98.6	62.2
1996	128.9	146.2	103.1	58.9
1997	125.3	141	105.7	61.1
1998	96.4	107.1	105	56.9
1999	97.4	109.9	99.7	54.1
2000	100	100	100	100.0
2001	105.8	91.1	101.4	54.1
2002	105	89.6	100.5	56.5
2003	98	79.5	96.8	55.6
2004	93.3	73.1	95.5	54.2

Table 7: Real effective exchange rate of major ASEAN countries (base 2000=100)

Year	Malaysia	Philippines	Singapore	India
1990	97.1	93.8	93.6	116.6
1991	96	93.5	96.8	147.8
1992	102.6	104.0	98.7	98.1
1993	120.5	103.2	99.4	91.7
1994	115.8	108.6	103.2	99.6
1995	115.7	111.4	104.9	98.9
1996	121.1	121.3	108.5	95.5
1997	119.4	120.6	110.6	101.6
1998	94.9	98.6	106.5	98.0
1999	97.6	107.2	99.7	95.8
2000	100	100	100	100.0
2001	105.5	95.1	100.8	103.2
2002	105.6	95.5	98	109.7
2003	97.1	83.2	93.9	112.3
2004	91.9	79.6	92.8	115.4

Table 8: Bilateral exchange rate (Local Currency Unit per US$)

Year	Indonesia	Malaysia	Philippines	Thailand	Singapore	India
1990	1842.81	2.70	24.31	25.59	1.81	17.50
1991	1950.32	2.75	27.48	25.52	1.73	22.74
1992	2029.92	2.55	25.51	25.40	1.63	25.92
1993	2087.10	2.57	27.12	25.32	1.62	30.49
1994	2160.75	2.62	26.42	25.15	1.53	31.37
1995	2248.61	2.50	25.71	24.92	1.42	32.43
1996	2342.30	2.52	26.22	25.34	1.41	35.43
1997	2909.38	2.81	29.47	31.36	1.48	36.31
1998	10013.62	3.92	40.89	41.36	1.67	41.26
1999	7855.15	3.80	39.09	37.81	1.69	43.06
2000	8421.78	3.80	44.19	40.11	1.72	44.94
2001	10260.85	3.80	50.99	44.43	1.79	47.19
2002	9311.19	3.80	51.60	42.96	1.79	48.61
2003	8577.13	3.80	54.20	41.48	1.74	46.58
2004	8938.90	3.80	56.04	40.22	1.69	40.22

ADF unit root tests

1.India

Variables	**ADF**	**10% critical value**
REP	-1.7331	-2.7042
ΔREP	-1.7381	-2.7180
ΔΔREP	-4.2416	-2.7349
RIPI	-2.2018	-2.7042
ΔRIPI	-1.6358	-2.7042
ΔΔRIPI	-3.3330	-2.7349
PI	-3.3918	-2.7042
RPI	-2.2324	-2.7042
ΔRPI	-1.6068	-2.7180
Δ ΔRPI	-3.3654	-2.7349
RWP	-3.3918	-2.7042
REER	-5.7905	-2.7042
NEER	-2.8045	-2.7042

2. Indonesia

Variables	ADF	10% critical value
REP	-1.1639	-2.7042
ΔREP	-2.4085	-2.7180
ΔΔREP	-3.3857	-2.7349
PI	-1.1390	-2.7042
ΔPI	-2.6716	-2.7180
ΔΔPI	-3.5990	-2.7349
RPI	-1.1541	-2.7042
ΔRPI	-2.2606	-2.7180
ΔΔRPI	-3.4729	-2.7349
RWP	-0.5433	-2.7042
ΔRWP	-2.1480	-2.7180
ΔΔRWP	-3.8726	-2.7349
BER	-0.8277	-2.7042
ΔBER	-3.0270	-2.7180

3.Malaysia

Variables	ADF	10% critical value
RWP	-1.5810	-2.7042
ΔRWP	-1.5781	-2.7180
Δ ΔRWP	-2.0433	-2.7349
REER	-2.0023	-2.7042
ΔREER	-2.7004	-2.7180
NEER	-1.1082	-2.7042
ΔNEER	-2.7817	-2.7180

4. Philippines

Variables	ADF	10% critical value
REP	0.2177	-2.7042
ΔREP	-2.5171	-2.7180
ΔΔREP	-5.1355	-2.7349
RIPI	-0.1594	-2.7042
ΔRIPI	-2.9925	-2.7180
PI	0.0522	-2.7042
ΔPI	-2.4606	-2.7180
ΔΔPI	-4.1204	-2.4349
RPI	-0.1165	-2.7042
ΔRPI	-2.5917	-2.7180
ΔΔRPI	-4.3252	-2.7349
RWP	0.3372	-2.7042

ΔRWP	-2.2369	-2.7180
ΔΔRWP	-3.1806	-2.7349
REER	-0.6217	-2.7042
ΔREER	-2.2311	-2.7180
ΔΔREER	-4.8893	-2.7349
NEER	0.34014	-2.7042
ΔNEER	-1.9079	-2.7180
ΔΔNEER	-3.9222	-2.7349

5. Singapore

Variables	ADF	10% critical value
REP	-1.1589	-2.7042
ΔREP	-1.9487	-2.7180
ΔΔREP	-4.0697	-2.7349
RIPI	-1.8692	-2.7042
ΔRIPI	-1.7953	-2.7180
ΔΔRIPI	-3.9011	-2.7349
PI	-1.0049	-2.7042
ΔPI	-1.6775	-2.7180
ΔΔPI	-2.5598	-2.7349
RPI	-1.4163	-2.7042
ΔRPI	-3.6530	-2.7180
RWP	-1.7980	-2.7042
ΔRWP	-0.8213	-2.7180
ΔΔRWP	-2.7801	-2.7349
REER	-1.9365	-2.7042
ΔREER`	-2.2987	-2.7180
ΔΔREER	-4.2265	-2.7349
NEER	-1.9365	-2.7042
ΔNEER	-2.0019	-2.7180
ΔΔNEER	-4.2265	-2.7349

6. Thailand

Variables	ADF	10% critical value
REP	-1.5364	-2.7042
ΔREP	-2.3263	-2.7180
ΔΔREP	-3.5386	-2.7349
RIPI	-0.4607	-2.7042
ΔRIPI	-3.0680	-2.7180
PI	-2.5128	-2.7042
ΔPI	-2.2092	-2.7180
ΔΔPI	-4.7826	-2.7349
RPI	-0.7428	-2.7042
ΔRPI	-1.9383	-2.7180
ΔΔRPI	-3.1649	-2.7349
RWP	-1.4021	-2.7042
ΔRWP	-2.2718	-2.7180
ΔΔRWP	-2.9385	-2.7349
BER	-0.9384	-2.7042
ΔBER	-2.6351	-2.7180
ΔΔBER	-4.4459	-2.7349

REP- Relative export price index
RIPI-Relative import price index
RWP-Relative whole price index
PI-Profitability index
RPI-Relative profitability index
Δx → first difference
ΔΔ →second difference

Table 9: Bilateral exchange rate and trade competitiveness of Indonesia 1990-2004
Regression analysis

1. EPI = 119.42 - 0.00135 BER + [AR (1) =0.79991]
(3.217) (-0.715) (2.927)

R^2 =0.33 Adj. R^2 =0.21 DW=2.09
AIC=8.22 SC=8.36

2. ΔEPI = -0.0014ΔBER
(-0.8282)

R^2 = -0.009 DW=2.2
AIC = 8.08 SC=8.12

3. RWPI = 16.09 + 0.00997 BER
(3.2359) (12.8674)

R^2 =0.93 DW=1.47
AIC =7.65 SC= 7.74

4. ΔRWPI = 0.004 ΔBER + [AR (1) =0.2493]
(6.462) (2.429)

Adj. R^2 =0.72 DW=1.94
AIC = 6.59 SC=6.67

5. PI = 386.75 - 0.0330 BER
(27.916) (-15.289)

R^2 =0.95 DW=2.23
AIC=9.7 SC=9.79

6. ΔPI = -0.01855ΔBER
(-5.3462)

R^2 = 62 DW=1.71
AIC =9.50 SC=9.55

7. RPI = 289.80 - 0.022BER
(30.45) (-14.64)

R^2 = 0.94 DW=2.23
AIC =8.94 SC=9.04

8. ΔRPI = -0.0141ΔBER
(-4.4189)

R^2 =0.57 DW=2.12
AIC =9.33 SC=9.38

Vector error correction models

1.ΔEPI_t = -0.8545 EC_{t-1} -0.1101ΔEPI_{t-1} +0.2209 ΔEPI_{t-2} -0.0065ΔBER_{t-1} -0.0021ΔBER_{t-2}
(-2.4831) (-0.3032) (0.9386) (-2.797) (-0.6422)

+ 8.42087
(1.7731)

R-squared 0.79
Adj R squared 0.62
Akaike AIC 7.49
Schwarz SC 7.74
Log Likelihood -38.98

2.$\Delta RWPI_t$ =-0.19897EC_{t-1}-5.0944$\Delta RWPI_{t-1}$+1.953$\Delta RWPI_{t-2}$ +0.02797ΔBER_{t-1} +0.0029ΔBER_{t-2}
(-0.0999) (-1.5556) (1.16004) (1.3548) (0.6121)

+ 10.919
(0.6877)

R-squared 0.32
Adj R squared -0.24
Akaike AIC 8.31
Schwarz SC 8.55
Log Likelihood -43.86

3. $\Delta PI_t = 1.5116EC_{t-1} + 0.8843\Delta PI_{t-1} - 0.6570\Delta PI_{t-2} + 0.0034\Delta BER_{t-1} + 0.0073\Delta BER_{t-2}$
(1.3096) (0.8728) (-0.9692) (0.13999) (0.4288)

-22.6561
(-1.2198)

R-squared 0.42
Adj R squared -0.05
Akaike AIC 10.92
Schwarz SC 11.16
Log Likelihood -59.51

4. $\Delta RPI_t = -0.7170EC_{t-1} + 1.0902\Delta RPI_{t-1} + 0.5021\Delta RPI_{t-2} + 0.0181\Delta BER_{t-1} + 0.1836\Delta BER_{t-2}$
(-0.4161) (0.9161) (0.6007) (0.6880) (01.1287)

-12.078
(-0.7746)

R-squared 0.24
Adj R squared -0.37
Akaike AIC 10.9
Schwarz SC 11.15
Log Likelihood -59.45

Table 10: Nominal effective exchange rate and trade competitiveness of Malaysia 1990-2004
Regression Analysis

2. RWPI = 104.42 +0.01177NEER + [AR (1) = 1.4844, AR (2) = -0.6821]
(7.6011) (0.0955) (5.5544) (-2.3208)

R^2 =0.88 Adj. R^2 =0.84 DW=2.4
AIC=5.78 SC=5.96

ΔRWPI = -0.0128ΔNEER + [AR (1) =0.5336]
(-0.1164) (1.9952)

R^2 =0.24 Adj.R^2 = 0.17 DW=1.95
AIC=5.71 SC=5.799

Vector Error Correction Models

$\Delta RWPI_t = -0.8804EC_{t-1} + 0.3035\Delta RWPI_{t-1} + 0.3989\Delta RWPI_{t-2} - 0.2883\Delta NEERI_{t-1} - 0.30995\Delta NEER_{t-2}$
(-5.5109) (1.7976) (2.3557) (-2.8482) (-3.1842)

-0.8429
(-1.4137)

R-squared 0.90
Adj R squared 0.81
Akaike AIC 4.43
Schwarz SC 4.68
Log Likelihood -20.61

Table 11: Real effective exchange rate and trade competitiveness of Malaysia 1990-2004- A Regression Analysis

1. RWPI = 103.37 +0.0217REER + [AR (1) =1.4837, AR (2) = -0.6827]
(8.2332) (0.1976) (5.5452) (-2.3256)

R^2 = 0.84 Adj. R^2 =0.84 DW=2.4
AIC= 5.78 SC=5.96

2. ΔRWPI = 0.00371ΔREER + [AR (1) =0.5303]
(0.03524) (1.9959)

R^2 =0.24 Adj.R^2 =0.17 DW=1.95
AIC= 5.71 SC=5.8

Vector error correction model

$\Delta RWPI_t$=-0.4380EC_{t-1} +0.4095$\Delta RWPI_{t-1}$+0.4211$\Delta RWPI_{t-2}$-0.0763$\Delta REERI_{t-1}$ -0.14065Δ $REER_{t-2}$
(-2.2045) (1.3137) (1.1823) (-0.5518) (-0.9348)

-0.02015
(-0.01698)

R-squared	0.61
Adj R squared	0.29
Akaike AIC	5.75
Schwarz SC	5.99
Log Likelihood	-28.52

Table 12: Bilateral exchange rate and trade competitiveness of Malaysia 1990-2004
a) Regression results

2. RWPI = 109.45 -1.1498BER + [AR (1) = 1.4641, AR (2) = -0.6743]
(9.3460) (-0.3661) (5.4811) (-2.3220)

R^2 =0.88 Adj. R^2 =0.84 DW=2.4
AIC=5.78 SC=5.95

ΔRWPI = -0..6667ΔBER + [AR (1) =0.5212]
(-0.2139) (1.9418)

R^2 =0.24 Adj.R^2 = 0.17 DW=1.95
AIC=5.70 SC=5.799

Vector Error Correction Models

$\Delta RWPI_t$=-1.1909EC_{t-1}+0.3172$\Delta RWPI_{t-1}$+0.2483$\Delta RWPI_{t-2}$ +11.9060 $\Delta BERI_{t-1}$ +9.8108ΔBER_{t-2}
(-10.4097) (3.3747) (2.7822) (6.2410) (6.3382)

-2.3903
(-5.8407)

R-squared	0.97
Adj R squared	0.94
Akaike AIC	3.24
Schwarz SC	3.48
Log Likelihood	-13.72

Table 13: Real Effective exchange rate and trade competitiveness of Philippines - Regression :1990-2004

1. EPI= -10.1808 + 1.1589REER + [AR (1) =0.7763]
(-0.2319) (2.3554) (3.2315)

R^2 =0.83Adj.R^2 =0.80 DW=2.29
AIC=7.98 SC=8.12

2. ΔEPI = 1.0056ΔREER
(2.730)

R^2 =0.32DW=2.43
AIC=7.86 SC=7.91

3. IPI = -49.45 + 1.6207REER +[AR (1) =1.4415, AR (2) = -0.5353]
(-0.8489) (4.6284) (5.2822) (-1.9583)

R^2 =0.96Adj. R^2 =0.95 DW=1.9
AIC=8.15 SC=8.33

4. ΔIPI = 1.5759ΔREER +[AR (1) =0.5969]
(4.9318) (2.4647)

R^2 =0.59 Adj.R^2 =0.55 DW=1.82
AIC= 8.06 SC=8.15

5. RWPI = 141.70- 0.0447REER + [AR (1) = 0.9215]
(2.0323) (-0.2332) (6.7303)

R^2 =0.84 Adj. R^2 =0.81 DW=1.47
AIC=6.45 SC=6.59

6. ΔRWPI = 0.03939ΔREER + [AR (1) =0.3178]
(0.2723) (1.3938)

R^2 =0.15 Adj.R^2 =-0.26 DW=2.15
AIC=6.23 SC=6.32

7. PI = -119.58 + 1.6686REER + [AR (1) =1.1832,AR(2) =-0.2551]
(-1.1873) (4.3999) (3.8163) (-0.9228)

R^2 =0.97 Adj. R^2 =0.96 DW=1.81
AIC=7.98 SC=8.15

8. ΔPI =1.6539ΔREER +[AR (1) =0.5847]
(5.5195) (3.2406)

R^2 =0.58 Adj.R^2 =0.54 DW=2.00
AIC=8.01 SC=7.92

9. RPI = -7.4807 +1.0479REER +[AR (1) =0.7201]
(-0.1467) (1.8668) (2.8450)

R^2 =0.78 Adj. R^2 =0.74 DW=1.64
AIC=8.33 SC=8.47

10. ΔRPI = 0.7159ΔREER
(1.6098)

R^2 =0.07 DW=1.7
AIC=8.24 SC=8.28

b) Vector error correction models

1.ΔEPI_t=1.0646 EC_{t-1}-1.1858ΔEPI_{t-1}-0.6573ΔEPI_{t-2} +0.3068$\Delta REER_{t-1}$ +0.4271$\Delta REER_{t-2}$
(2.3511) (-1.9078) (-1.4307) (0.4451)N (0.6659)

-11.724
(-2.2745)

R-squared 0.60
Adj R squared 0.27
Akaike AIC 8.31
Schwarz SC 8.55
Log Likelihood -43.87

2..ΔIPI_t= 0.2579EC_{t-1} -0.1331ΔIPI_{t-1} -0.2812$\Delta OIPI_{t-2}$ -0.3372$\Delta REER_{t-1}$ +0.03Δ $REER_{t-2}$
(1.3799) (-0.3253) (-0.4511) (-0.4547) (0.0264)

-16.0876
(-2.1367)

R-squared 0.44
Adj R squared -0.03
Akaike AIC 8.45
Schwarz SC 8.69
Log Likelihood -44.71

3. ΔPI_t =-0.3337EC_{t-1} +0.05735ΔPI_{t-1} -0.0326ΔPI_{t-2} -0.9851$\Delta REER_{t-1}$ -0.5077$\Delta REER_{t-2}$
(2.0264) (0.1096) (-0.05409) (-1.1128) (-0.3608)

-13.310
(-1.3018)

R-squared	0.54
Adj R squared	0.15
Akaike AIC	8.78
Schwarz SC	9.03
Log Likelihood	-46.71

4. $\Delta RPI_t = 0.4659EC_{t-1} + 0.0011\Delta RPI_{t-1} - 0.6762\Delta RPI_{t-2} - 0.1007\Delta REER_{t-1} + 1.4842\Delta REER_{t-2}$
(1.0699) (0.0027) (-1.8548) (-0.1755) (2.5186)

-7.9625
(-1.6446)

R-squared	0.58
Adj R squared	0.24
Akaike AIC	8.40
Schwarz SC	8.64
Log Likelihood	-44.38

5. $\Delta RWPI_t = 0.02EC_{t-1} - 0.025\Delta RWPI_{t-1} + 0.0697\Delta RWPI_{t-2} - 0.21\Delta REER_{t-1} - 0.0880\Delta REER_{t-2}$
(0.0783) (-0.055) (0.2037) (-0.9640) (-0.3786)

+2.0686
(0.9376)

R-squared	0.17
Adj R squared	-0.52
Akaike AIC	6.66
Schwarz SC	6.90
Log Likelihood	-33.96

Table 14: Nominal Effective exchange rate and trade competitiveness of Philippines – Regression Analysis 1990-2004 a) results

1. EPI = -5.0568 + 0.9609NEER
(0.4719) (10.714)

R^2 =0.89 DW=2.05
AIC=7.25 SC=7.35

2. ΔEPI = 0.8091ΔNEER + [AR (1) =-0.4073]
(3.118) (-1.4708)

R^2 =0.46 Adj.R^2 =0.41 DW=2.11
AIC=7.85 SC=7.94

3. IPI = -37.65 +1.5305NEER +[AR (1) =1.2890, AR (2) =-0.5497]
(-1.3887) (6.4580) (5.6145) (-2.5489)

R^2 =0.98 Adj. R^2 =0.97 DW=2.2
AIC=7.58 SC=7.75

4. ΔIPI = 1.3828ΔNEER +[AR (1) =0.4532]
(5.6027) (1.8229)

R^2 =0.71 Adj.R^2 =0.68 DW=1.8
AIC=7.17 SC=7.80

5. RWPI = -129.156 - 0.13796NEER +[AR (1) =0.8407]
(6.546) (-1.031) (5.2481)

R^2 =0.85 Adj. R^2 =082 DW=1.62
AIC=6.41 SC=6.55

6. ΔRWPI = 0.0117ΔNEER + [AR (1) =0.3097]
(0.1002) (1.359)

R^2 =0.16 Adj.R^2 =-0.26 DW=2.17
AIC=6.24 SC=6.33

7. PI = -61.198 + 1.496NEER +[AR (1) =0.8148]
(-2.4193) (6.0458) (9.5419)

R^2 =0.98 Adj. R^2 =98 DW=1.9
AIC=7.49 SC=7.6

8. ΔPI = -8.2022ΔNEER + [AR(1)=1.3017
(1.9690) (4.8321)

R^2 =0.66 Adj.R^2 =0.63 DW=1.5
AIC=7.75 SC=7.85

9. RPI = -4.0036 + 0.9026NEER +[AR (1) =0.4025]
(0.1710)(4.4698)(1.42207)

R^2 =0.82 Adj. R^2 =0.78 DW=1.66
AIC=8.16 SC=8.29

10. ΔRPI = 0.6193ΔNEER
(1.9690)

Adj.R^2 =0.14 DW=1.96
AIC=8.16 SC=8.20

b) Vector Error correction models

1.ΔEPI_t=-0.879EC_{t-1}+0.4644ΔEPI_{t-1}+0.2676ΔEPI_{t-2} -0.8636$\Delta NEER_{t-1}$ +0.01958$\Delta NEER_{t-2}$
(-0.7534) (0.5067) (0.4116) (-0.8679) (0.0275)

-4.638
(-0.7810)

R-squared 0.27
Adj R squared -0.34
Akaike AIC 8.92
Schwarz SC 9.16
Log Likelihood -47.51

2.ΔIPI_t= +0.8319EC_{t-1} +0.0609ΔIPI_{t-1} -0.9167ΔIPI_{t-2} -0.3839$\Delta NEER_{t-1}$ +1.3641$\Delta NEER_{t-2}$
(1.8699) (0.1211) (-1.5827) (-0.5599) (1.6219)

-15.6602
(-2.730)

R-squared 0.49
Adj R squared 0.06
Akaike AIC 8.36
Schwarz SC 8.60
Log Likelihood -44.17

3.ΔPI_t=+0.3606EC_{t-1} +0.1765ΔPI_{t-1} -0.9799ΔPI_{t-2} -0.4988$\Delta NEER_{t-1}$ Δ+1.7251$\Delta NEER_{t-2}$
(0.8253) (0.33254) (-1.5691) (-0.6243) (1.7993)

-20.960
(-2.1485)

R-squared 0.48
Adj R squared 0.05
Akaike AIC 8.9
Schwarz SC 9.1
Log Likelihood -47.41

4.ΔRPI_t=-0.9812EC_{t-1} +0.4668ΔRPI_{t-1}+0.0172ΔRPI_{t-2} -1.1059$\Delta NEER_{t-1}$ -0.1117$\Delta NEER_{t-2}$
(-1.834) (1.4629) (0.0474) (-1.8214) (-0.1748)

-6.6937
(-1.3872)

R-squared 0.61
Adj R squared 0.28
Akaike AIC 8.33

Schwarz SC 8.58
Log Likelihood .-44.01

5.$\Delta RWPI_t$=-0.747EC_{t-1} +0.147$\Delta RWPI_{t-1}$-0.039$\Delta RWPI_{t-2}$ +0.199$\Delta NEER_{t-1}$ +0.191Δ $NEER_{t-2}$
(-2.4917) (0.5024) (-0.1770) (1.0854) (1.2908)

+3.5636
(2.0044)

R-squared 0.61
Adj R squared 0.29
Akaike AIC 5.89
Schwarz SC 6.14
Log Likelihood -29.37

Table 15: Real effective exchange rate and e and trade competitiveness of Singapore- Regression Analysis: 1990-2004

1. EPI = 81.097 + 0.2355 REER + [AR (1) =0.8023]
(0.5379) (0.1491) (0.2662)

R^2 =0.60 Adj. R^2 =0.53 DW=1.60
AIC = 7.74 SC=7.87

2. ΔEPI = -0.1040ΔREER
(-0.1212)

R^2 = -0.02 DW=1.66
AIC = 7.53 SC=7.58

3. IPI = 51.005 + 0.5520REER + [AR (1) =0.6504]
(0.2568) (0.2826) (1.9639)

R^2 =0.51 Adj. R^2 =0.42 DW=1.5
AIC = 8.46 SC=8.59

4. ΔIPI = 0.0691ΔREER
(0.05303)

R^2 =-0.001 DW=1.66
AIC = 8.37 SC=8.41

5. RWPI = 93.501 + 0.1129REER + [AR (1) =0.7595]
(0.7388) (0.0865) (6.1136)

R^2 =0.84 Adj. R^2 = 0.81 DW=1.41
AIC = 7.98 SC=8.11

6. ΔRWPI = 0.7560ΔREER + [AR (1) =0.5183]
(0.5344) (1.463)

R^2 =0.06 Adj. R^2 =-0.02 DW=1.45
AIC = 8.18 SC=8.27

7. PI = -11.664 + 0.8029REER + [AR (1) =0.9677]
(-0.0589) (1.3252) (5.3951)

R^2 =0.89 Adj. R^2 =0.87 DW=1.5
AIC = 6.29 SC=6.43

8. ΔPI = -0.1964ΔREER + [AR (1) =0.6728]
(-0.3956) (2.7393)

R^2 =0.34 Adj. R^2 =0.28 DW=1.90
AIC = 5.9 SC=6.08

9. RPI = 219.33 - 1.1207REER + [AR (1) =0.8097]
(2.6468) (-1.2659) (7.41)

R^2 =0.89 Adj. R^2 =0.87 DW=2.31
AIC = 7.20 SC=7.34

10. $\Delta RPI = -0.5040\Delta REER$
(0.6076)

R^2 =-0.24 DW=1.66
AIC = 7.46 SC=7.51

b) Vector Error correction models

1.$\Delta EPI_t = -0.7248EC_{t-1} + 0.7656\Delta EPI_{t-1} \; 0.5460\Delta EPI_{t-2} \; -0.0423\Delta REER_{t-1} + 1.0699\Delta REER_{t-2}$
(-1.0630) (1.0820) (0.8130) (0.6228) (0.6228)

+ -0.3668
(-0.0905)

R-squared 0.18
Adj R squared -0.50
Akaike AIC 8.33
Schwarz SC 8.57
Log Likelihood -43.98

2. $\Delta IPI_t = -1.2271EC_{t-1} + 0.9724\Delta IPI_{t-1} + 0.9023\Delta IPI_{t-2} + 1.3092\Delta REER_{t-1} + 2.5395\Delta REER_{t-2}$
(-3.1471) (2.7442) (2.4772) (-0.7577) (1.7361)

-1.7140
(-0.4459)

R-squared 0.67
Adj R squared 0.39
Akaike AIC 8.26
Schwarz SC 8.50
Log Likelihood -43.54

3. $\Delta PI_t = -0.1615EC_{t-1} + 0.5460\Delta EPI_{t-1} + 0.0637\Delta PI_{t-2} + 0.2103\Delta REER_{t-1} + 0.3221\Delta REER_{t-2}$
(-1.1025) (1.4764) (0.1132) (0.2422) (0.5061)

-1.2693
(-0.7505)

R-squared 0.43
Adj R squared -0.05
Akaike AIC 6.5
Schwarz SC 6.74
Log Likelihood -33.00

4. $\Delta RPI_t = -0.3466EC_{t-1} \; -0.1698\Delta RPI_{t-1} \; -0.6395\Delta RPI_{t-2} \; -0.5852\Delta REER_{t-1} \; -0.8931\Delta REER_{t-2}$
(-1.6166) (-0.4709) (-1.715) (-0.4344) (-0.7225)

+9.2498
(2.3754)

R-squared 0.51
Adj R squared 0.11
Akaike AIC 7.53
Schwarz SC 7.77
Log Likelihood -39.18

5. $\Delta RWPI_t = -0.5374\ EC_{t-1} - 0.5767\Delta RWPI_{t-1} - 0.8526\ \Delta RWPI_{t-2} + 1.7743\Delta REER_{t-1} \; -0.15391\Delta REER_{t-2}$
(-1.7607) (-0.6999) (-1.0981) (0.6537) (-0.0825)

-13.6564
(-1.3416)

R-squared 0.61
Adj R squared 0.29
Akaike AIC 8.05
Schwarz SC 8.29
Log Likelihood -42.28

Table 16: Nominal effective exchange rate and e and trade competitiveness-Regression Analysis: Singapore 1990-2004

1. EPI = 144.73 - 0.3988NEER + [AR (1) =0.8212]
(0.8205) (-0.2227) (2.6737)

R^2 =0.60 Adj. R^2 =0.53 DW=1.46
AIC = 7.73 SC=7.87

2. ΔEPI = -0.3863ΔNEER
(-0.4224)

R^2 =-0.003 DW=1.61
AIC = 7.52 SC=7.57

3. IPI = 305.326 - 2.0125NEER + [AR (1) =1.0201, AR (2) =-0.3985]
(1.1168) (-0.7292) (3.0172) (-1.5325)

R^2 =0.59 Adj. R^2 = 0.45 DW=2.48
AIC =8.47 SC=8.65

4. ΔIPI = -0.2511ΔNEER
(-0.1799)

R^2 =0.0009 DW=1.61
AIC = 8.37 SC=8.41

5. RWPI = 185.67 - 0.8046NEER + [AR (1) =0.7616]
(1.2603) (-0.5400) (6.2101)

R^2 =0.84 Adj. R^2 =0.82 DW=1.51
AIC = 7.94 SC=8.08

6. ΔRWPI = -1.1639ΔNEER + [AR (1) =0.2152]
(-0.7713) (0.5309)

R^2 =0.06 Adj.R^2 = -0.02 DW=1.41
AIC = 8.18 SC=8.27

7. PI = 164.28 - 0.5976NEER + [AR (1) =1.6643, AR (2) =-0.8111]
(2.9921) (-1.0734) (8.3819) (-3.7625)

R^2 =0.93 Adj. R^2 = 0.91 DW=2.1
AIC =6.07 SC=6.24

8. ΔPI = -0.3075ΔNEER + [AR (1) =0.6759]
(-0.5047) (2.7711)

R^2 =0.35 Adj. R^2 =0.29 DW=1.88
AIC = 5.33 SC=5.95

9. RPI = 181.91 - 0.6781NEER + [AR (1) =0.8479]
(1.6882) (-0.5973) (8.364)

R^2 =0.88 Adj. R^2 =0.85 DW=2.31
AIC =7.34 SC=7.47

10. ΔRPI = 0.4572ΔNEER
(0.5119)

R^2 =-0.26 DW=1.80
AIC = 7.47 SC=7.51

Vector Error Correction Models

1. ΔEPI_t = 0.3728EC_{t-1} -0.4980ΔEPI_{t-1} -0.4951ΔEPI_{t-2} -0.4433$\Delta NEER_{t-1}$ -1.1069$\Delta NEER_{t-2}$
(1.1281) (-0.7340) (-0.7776) (-0.2264) (-0.5022)

-0.4440
(-0.1009)

R-squared 0.19
Adj R squared -0.48
Akaike AIC 8.32
Schwarz SC 8.56
Log Likelihood -43.90

2. $\Delta IPI_t = -0.6925EC_{t-1} + 0.0246\Delta IPI_{t-1} + 0.1803\Delta IPI_{t-2} + 0.4023\Delta NEER_{t-1} + 2.3402\Delta NEER_{t-2}$
(-6.7417) (0.182I) (1.1274) (0.3625) (2.3012)

-3.3113
(-1.4005)

R-squared 0.90
Adj R squared 0.81
Akaike AIC 7.08
Schwarz SC 7.32
Log Likelihood -36.47

3. $\Delta PI_t = -0.1723EC_{t-1} + 0.5974\Delta PI_{t-1} + 0.0871\Delta PI_{t-2} + 0.2462\Delta NEER_{t-1} + 0.1177\Delta NEER_{t-2}$
(-0.8828) (1.5583) (0.1623) (0.2432) (0.1459)

-1.4294
(-0.6404)

R-squared 0.41
Adj R squared -0.08
Akaike AIC 6.55
Schwarz SC 6.78
Log Likelihood -33.28

4. $\Delta RPI_t = -0.5326EC_{t-1} - 0.1227\Delta RPI_{t-1} - 0.6322\Delta RPI_{t-2} - 1.4168\Delta NEER_{t-1} - 1.3670\Delta NEER_{t-2}$
(-2.2997) (-0.4197) (-1.9908) (-1.0219) (-1.0432)

+ 11.75337
(2.8990)

R-squared 0.62
Adj R squared 0.30
Akaike AIC 7.28
Schwarz SC 7.52
Log Likelihood -37.67

5. $\Delta RWPI_t = -0.7605EC_{t-1} - 0.1735\Delta RWPI_{t-1} - 0.5842\Delta EPI_{t-2} + 1.0218\Delta NEER_{t-1} + 0.5913\Delta NEER_{t-2}$
(-1.6518) (-0.2758) (-0.8221) (0.3504) (-0.2752.)

-10.7433
(-1.1466)

R-squared 0.62
Adj R squared 0..30
Akaike AIC 8.04
Schwarz SC 8.28
Log Likelihood -42.25

Table 17: Bilateral exchange rate and trade competitiveness of Thailand 1990-2004
A Regression analysis

1. EPI = 29.13 + 1.7811 BER +[AR (1) =0.4692]
(1.5122) (3.3146) (1.8058)

R^2 =0.72 Adj. R^2 =0.67 DW=1.61
AIC = 7.51 SC=7.64

2. ΔEPI = 1.9924ΔBER
(2.6164)

R^2 =0.34 DW=1.88
AIC = 7.55 SC=7.59

3. IPI = -17.2135 + 3.0997BER +[AR (1) =0.3584]
(-1.2314) (7.7268) (1.07434)

R^2 = 0.92 Adj. R^2=0.91 DW=1.61
AIC = 7.06 SC=7.20

4. ΔIPI = 3.1831ΔBER
(5.2086)

R^2 =0.65 DW=2.01
AIC = 7.11 SC=7.15

5. RWPI = 87.04 +0.4194BER +[AR (1) =1.4407,AR(2)=-0.5949]
(9.0405) (2.0110) (6.8067) (-2.6215)

R^2 = 0.81 Adj. R^2 = 0.75 DW=2.04
AIC = 5.15 SC=5.32

6. ΔRWPI = 0.3782ΔBER +[AR (1) =0.4889]
(1.8278) (2.2575)

R^2 =0.30 Adj. R^2 =0.23 DW=1.68
AIC = 5.09 SC=5.17

7. PI = 89.1644 +0.1133BE +[AR (1) =0.6114]
(2.4913) (0.1217) (3.1139)

R^2 =0.47 Adj. R^2 = 0.38 DW=2.04
AIC = 8.22 SC=8.35

8. ΔPI = 0.3315ΔBER
(0.2954)

R^2 =-0.05 DW=2.02
AIC =8.32 SC=8.37

9. RPI = -8.19 +2.6096BER + [AR (1) =0.3056]
(-0.6502) (7.2657) (1.0430)

R^2 =0.90 Adj. R^2 = 0.89 DW=1.76
AIC =7.08 SC=7.21

10. ΔRPI = 2.0481ΔBER
(3.2717)

R^2 =0.41 DW=2.10
AIC =7.16 SC=7.20

In first difference
Error correction models

1. ΔEPI_t = -1.6370EC_{t-1} +0.7095ΔEPI_{t-1} +0.6789$_{t-2}$ -0.4532ΔBER_{t-1} -0.8439Δ BER_{t-2}
(-2.9537) (1.8202) (1.5810) (-0.3837) (-0.6758)

+ 1.2286
(0.3100)

R-squared =0.6029
Adj R squared =0.2720
Akaike AIC =8.04
Schwarz SC =8.28
Log Likelihood= -42.24

2. ΔIPI_t = -1.7402EC_{t-1} +0.4113ΔIPI_{t-1} +0.5642ΔIPI_{t-2} -1.8820ΔBER_{t-1} -4.1006Δ BER_{t-2}
(-1.9237) (0.5948) (0.8352) (-0.7103) (-1.4774)

+9.1492
(1.7425)

R-squared 0.46
Adj R squared 0.02

Akaike AIC 8.53
Schwarz SC 8.78
Log Likelihood -45.20

3. ΔPI_t = -1.2120EC_{t-1} +0.3505ΔPI_{t-1} +0.3044ΔPI_{t-2} +0.4452ΔBER_{t-1} +1.1273Δ BER_{t-2}
(-10.419) (3.4453) (2.8155) (1.0380) (2.7756)

-3.6108
(-1.958)

R-squared 0.95
Adj R squared 0.91
Akaike AIC 6.29
Schwarz SC 6.53
Log Likelihood -31.74

4. ΔRPI_t = -2.0924EC_{t-1} +0.8554ΔRPI_{t-1} +0.8384ΔRPI_{t-2} -2.0731ΔBER_{t-1} -1.9881ΔBER_{t-2}
(-2.8345) (1.6824) (1.8644) (-1.3123) (-1.4185)

+ 3.4345
(1.0202)

R-squared 0.61
Adj R squared 0.29
Akaike AIC 7.75
Schwarz SC 7.99
Log Likelihood -40.49

5. $\Delta RWPI_t$ = -0.1667EC_{t-1} +0.2744$\Delta RWPI_{t-1}$ +0.0295$\Delta RWPI_{t-2}$ -0.3874$\Delta BERI_{t-1}$ -0.3219ΔBER_{t-2}
(-0.4517) (0.7488) (0.1164) (-0.9855) (-0.8979)

+0.4916
(0.4520)

R-squared 0.67
Adj R squared 0.40
Akaike AIC 5.04
Schwarz SC 5.29
Log Likelihood -24.26

Table 18: Real Effective exchange rate and trade competitiveness of India 1990-2004: Regression Ananlysis

a) A Regression analysis

1. EPI = 89.1653 +0.0512 REER + [AR (1) =0.6637]
(3.9314) (0.2524) (3.1800)

R^2 = 0.51 Adj. R^2 = 0.42 DW=1.75
AIC=7.73 SC=7.87

2. ΔEPI = 0.0198ΔREER
(0.1113)

R^2 = -0.007 DW=1.88
AIC=7.67 SC =7.71

3. IPI = -6.3141 + 0.9726 REER
(-0.192987) (3.1647)

R^2 =0.43 Adj.R^2 =0.39 DW=1.63
AIC=8.5 SC=8.59

4. ΔIPI = 0.0181 ΔREER + [AR (1) = 0.3660]
(0.0928) (1.394)

R^2 =0.16Adj.R^2 =0.08 DW=2.26
AIC=7.96 SC=8.05

5. RWPI = 109.3622 -0.0453 REER + [AR (1) =0.7085]
(17.0998) (-0.8499) (11.952)

R^2 =0.93 Adj.R^2 =0.92 DW= 2.22
AIC=5.10 SC=5.24

6. ΔRWPI = -0.0553 ΔREER + [AR (1) =0.517]
(-0.9014) (2.4232)

R^2 =0.28 Adj.R^2 =0.21 DW=2.79
AIC=5.79 SC=5.87

7. PI = 78.693 + 0.083 REER + [AR (1) = 0.6944]
(2.204) (0.278) (8.279)

R^2 =0.87 Adj. R^2 =.84 DW=2.35
AIC=8.55 SC=8.68

8. ΔPI = - 0.017 ΔREER + [AR (1) = 0.4112]
(-0.0497) (1.6347)

R^2 =-0.01 Adj. R^2 = -0.10 DW=2.44
AIC=9.2 SC=9.29

9. RPI = 74.091 + 0.1148REER + [AR (1) = 0.6165]
(2.476) (0.411) (3.839)

R^2 =0.63 Adj. R^2 =.56 DW=1.26
AIC=8.27 SC=8.41

10. ΔRPI = - 0.0017ΔREER + [AR (1) = 0.4175]
(-0.0076) (1.6386)

R^2 =0.18 Adj. R^2 =.0.11 DW=2.25
AIC=8.34 SC=8.42

Vector error correction models

1.ΔEPI_t = - 0.4644 EC_{t-1} + 0.4332 ΔEPI_{t-1} + 0.3836 ΔEPI_{t-2} + 0.2817 $\Delta REERI_{t-1}$ - 0.2385Δ $REER_{t-2}$
(-1.98799) (1.3560) (1.6741) (1.3811) (-1.1173)

+ 0.0727
(0.0316)

R-squared 0.7652
Adj R squared 0.5696
Akaike AIC 7.22
Schwarz SC 7.46
Log Likelihood -37.3036

2. ΔIPI_t = - 0.1984 EC_{t-1} – 0.1211ΔIPI_{t-1} +0.2062ΔIPI_{t-2} + 0.8078 $\Delta REERI_{t-1}$ +0.2619 Δ $REER_{t-2}$
(-2.2954) (-0.3722) (1.1089) (3.0207) (0.98597)

+ 2.3796
(1.0597)

R-squared 0.82
Adj R squared 0.67
Akaike AIC 7.12
Schwarz SC 7.36
Log Likelihood -36.71

3. ΔPI_t = -0.8764EC_{t-1} +0.4295 ΔPI_{t-1} -0.0102 ΔPI_{t-2} -0.6438$\Delta REERI_{t-1}$ -0.6438 Δ $REER_{t-2}$
(-4.661) (2.4566) (-0.12801) (-1.6458)(-1.6458)

-7.0981
(-3.2220)

R-squared 0.98
Adj R squared 0.96
Akaike AIC 6.19
Schwarz SC 6.43
Log Likelihood -56.78

4. ΔRPI_t = -0.4542EC_{t-1} +0.5424 ΔRPI_{t-1} +0.2736 ΔRPI_{t-2} +0.00998$\Delta REERI_{t-1}$ -0.4437Δ $REER_{t-2}$
(-1.9079) (1.7891) (1.1883) (0.0285) (-1.7174)

+5020
(0.1653)

R-squared	0.77
Adj R squared	0.58
Akaike AIC	7.77
Schwarz SC	8.02
Log Likelihood	-40.65

5. $\Delta RWPI_t$ = -0.5749EC_{t-1}-0.0553$\Delta RWPI_{t-1}$+0.1198$\Delta RWPI_{t-2}$ +0.1048$\Delta REERI_{t-1}$+0.0497 Δ $REER_{t-2}$
(-1.1719) (-0.2073) (0.4666) (0.6271) (0.6123)

+ 2.01157
(1.4082)

R-squared	0.66
Adj R squared	0.37
Akaike AIC	5.46
Schwarz SC	5.70
Log Likelihood	-26.77

Table 19: Nominal Effective exchange rate and trade competitiveness 1990-2004- Regression Analysis

1 EPI = 103.257 -0.1556NEER + [AR (1) =0.6815]
(7.424) (-0.8499) (3.6713)

R^2 =0.53 Adj.R^2=0.45 AIC=7.68
DW=1.55 SC=7.81

2.ΔEPI = -0.09833ΔNEER
(0.6425)

R^2=0.02 AIC=7.64
DW=1.68 SC=7.68

3. IPI = 86.706 +0.072NEER + [AR (1) =1.029, AR (2) = -0.4077]
(6.790) (0.4659) (3.550) (-1.725)

R^2 =0.63 Adj.R^2=0.5 AIC=7.85
DW=2.43 SC=8.024

4.ΔIPI = 0.0845 ΔNEER + [Ar (1=0.3800)
(0.5721) (1.4633)

R^2 =0.19 Adj.R^2=0.11 AIC=7.93
DW=2.20 SC=8.02

5. RWPI = 105.7820 -0.017281NEER + [AR (1) =0.713589]
(22.61885) (-0.337099) (11.80956)

R^2 =0.93 Adj.R^2=0.92 AIC=5.16
DW=2.14 SC=5.29

6..ΔRWPI = -0.023191ΔNEER +[AR(1)=0.5827]
(-0.5111) (2.8198)

R^2 =0.24 Adj.R^2=0.17 AIC=5.84
DW=2.63 SC=5.92

7. PI = 84.37 +0.045311NEER + [AR (1) =0.697783]
(3.432459) (0.160837) (8.291856)

R^2 =0.86 Adj.R^2=0.84 AIC=8.55
DW=2.25 SC=8.69

8.ΔPI =0.08848ΔNEER + [AR (1) =0.3956]
(0.3268) (1.5746)

R^2 =-0.003Adj.R^2=-0.09 AIC=9.19
DW=2.41 SC=9.28

9 RPI =93.76030 -0.137620NEER + [AR (1) =0.631970]
(5.052181) (-0.545088) (4.485277)

R^2 =0.63Adj.R^2=0.56 AIC=8.26
DW=1.08 SC=8.40

10. ΔRPI =-0.1621ΔNEER + [AR (1) =0.4723]
(-1.0004) (2.0285)

R^2 =0.25Adj.R^2=-0.18 AIC=8.25
DW=2.37 SC=8.34

Vector error correction models

1. ΔEPI_t = -0.3057EC_{t-1} +0.00897ΔEPI_{t-1} +0.1747ΔEPI_{t-2} +0.5886$\Delta NEERI_{t-1}$ +0.3779$\Delta NEER_{t-2}$
(-2.3624) (0.0342) (0.6870) (2.9564) (2.2480)

+2.2615
(0.7796)

R-squared 0.65
Adj R squared 0.35
Akaike AIC 7.63
Schwarz SC 7.87
Log Likelihood -39.77

2. ΔIPI_t = -0.2854EC_{t-1} +0.22507ΔIPI_{t-1} +0.01780 ΔIPI_{t-2} +0.35705$\Delta NEERI_{t-1}$ +0.4073Δ $NEER_{t-2}$
(-2.6101) (0.9580) (0.07599) (1.6878) (2.4172)

+ 2.3147
(0.84909)

R-squared 0.73
Adj R squared 0.51
Akaike AIC 7.51
Schwarz SC 7.75
Log Likelihood -39.05

3. ΔPI_t = -0.6314EC_{t-1} -0.13803ΔPI_{t-1} -0.02158ΔPI_{t-2} +0.3983$\Delta NEERI_{t-1}$ +0.2159 $\Delta NEER_{t-2}$
(-6.5836) (-1.0216) (-0.1625) (2.4344) (1.3522)

-9.2509
(-2.7455)

R-squared 0.91
Adj R squared 0.83
Akaike AIC 7.56
Schwarz SC 7.80
Log Likelihood -39.35

4. ΔRPI_t =--0.377 EC_{t-1} +0.1673 ΔRPI_{t-1} +0.2045 ΔRPI_{t-2} +0.5842 $\Delta NEERI_{t-1}$ +0.37147Δ $NEER_{t-2}$
(-2.564) (0.6393) (0.8837) (2.6995) (1.7725)

+ 2.75197
(0.7689)

R-squared 0.70
Adj R squared 0.45
Akaike AIC 8.04
Schwarz SC 8.28
Log Likelihood -42.22

5. $\Delta RWPI_t$ =-0.1073EC_{t-1}+0.0862$\Delta RWPI_{t-1}$+0.3949$\Delta RWPI_{t-2}$ +0.0135$\Delta NEERI_{t-1}$-0.0079Δ $NEER_{t-2}$
(-0.3565) (0.2546) (1.3198) (0.1512) (-0.0655)

+ 0.3983
(0.2448)

R-squared 0.39
Adj R squared -0.12

Akaike AIC 6.03
Schwarz SC 6.28
Log Likelihood -30.20

Appendix Table 1: Estimated weights assigned to each competitors of India

Year	Malaysia	Philippines	Indonesia	Singapore	Thailand
1990	0.2418	0.0749	0.1938	0.5339	0.3539
1991	0.2481	0.0786	0.2134	0.4838	0.3184
1992	0.2422	0.0788	0.2290	0.4398	0.2840
1993	0.2400	0.0780	0.2332	0.4254	0.2667
1994	0.2651	0.0754	0.2265	0.4563	0.2697
1995	0.2775	0.0740	0.2110	0.4375	0.3065
1996	0.2943	0.0848	0.2329	0.4447	0.2968
1997	0.2786	0.0976	0.2550	0.4174	0.3095
1998	0.2740	0.1058	0.2430	0.4534	0.2622
1999	0.3218	0.1189	0.2389	0.4056	0.3387
2000	0.3136	0.1138	0.2423	0.4274	0.3108
2001	0.3302	0.1212	0.2660	0.4469	0.3389
2002	0.3467	0.1269	0.2609	0.4427	0.3740
2003	0.3579	0.1052	0.2435	0.4644	0.3799
2004	0.3636	0.0881	0.2224	0.4994	0.3704

Appendix Table 2: Estimated weights assigned to each competitors of Indonesia

Year	Malaysia	Philippines	Singapore	India	Thailand
1990	0.3154	0.0976	0.4876	0.1938	0.2918
1991	0.3463	0.0999	0.5102	0.2134	0.3282
1992	0.3852	0.1099	0.5592	0.2290	0.3667
1993	0.3891	0.1089	0.5858	0.2332	0.3477
1994	0.3557	0.0963	0.5480	0.2265	0.3046
1995	0.3428	0.0938	0.5141	0.2110	0.2986
1996	0.3531	0.1030	0.5221	0.2329	0.2948
1997	0.3706	0.1246	0.5119	0.2550	0.3087
1998	0.3369	0.1316	0.4918	0.2430	0.2765
1999	0.3344	0.1353	0.4142	0.2389	0.2722
2000	0.3483	0.1386	0.4390	0.2423	0.2780
2001	0.3379	0.1263	0.4336	0.2660	0.2832
2002	0.3233	0.1354	0.4024	0.2609	0.2786
2003	0.2880	0.1093	0.3856	0.2435	0.2729
2004	0.2828	0.0991	0.3787	0.2224	0.2538

Appendix Table 3: Estimated weights assigned to each competitors of Malaysia

Year	Philippines	Indonesia	Singapore	India	Thailand
1990	0.1098	0.3154	0.5789	0.2418	0.3363
1991	0.1096	0.3463	0.5662	0.2481	0.3600
1992	0.1132	0.3852	0.5683	0.2422	0.3638
1993	0.1208	0.3891	0.6016	0.2400	0.3593
1994	0.1204	0.3557	0.6472	0.2651	0.3602
1995	0.1284	0.3428	0.6549	0.2775	0.3849
1996	0.1373	0.3531	0.6292	0.2943	0.3672
1997	0.1631	0.3706	0.5944	0.2786	0.3566
1998	0.1849	0.3369	0.5980	0.2740	0.3327
1999	0.2185	0.3344	0.6004	0.3218	0.3882
2000	0.2063	0.3483	0.5919	0.3136	0.3798
2001	0.1872	0.3379	0.5676	0.3302	0.3736
2002	0.1933	0.3233	0.5398	0.3467	0.3750
2003	0.1601	0.2880	0.5706	0.3579	0.3863
2004	0.1507	0.2828	0.6245	0.3636	0.3793

Appendix Table 4: Estimated weights assigned to each competitors of Philippines

Year	Malaysia	Indonesia	Singapore	India	Thailand
1990	0.1098	0.0976	0.1913	0.0749	0.1171
1991	0.1096	0.0999	0.1818	0.0786	0.1234
1992	0.1132	0.1099	0.1792	0.0788	0.1207
1993	0.1208	0.1089	0.1811	0.0780	0.1173
1994	0.1204	0.0963	0.1833	0.0754	0.1077
1995	0.1284	0.0938	0.1855	0.0740	0.1112
1996	0.1373	0.1030	0.1949	0.0848	0.1188
1997	0.1631	0.1246	0.2179	0.0976	0.1380
1998	0.1849	0.1316	0.2507	0.1058	0.1492
1999	0.2185	0.1353	0.2554	0.1189	0.1644
2000	0.2063	0.1386	0.2460	0.1138	0.1570
2001	0.1872	0.1263	0.2246	0.1212	0.1494
2002	0.1933	0.1354	0.2344	0.1269	0.1612
2003	0.1601	0.1093	0.2084	0.1052	0.1411
2004	0.1507	0.0991	0.1973	0.0881	0.1231

Appendix Table 5: Estimated weights assigned to each competitors of Singapore

Year	Malaysia	Philippines	Indonesia	India	Thailand
1990	0.5789	0.1913	0.4876	0.5017	0.6923
1991	0.5662	0.1818	0.5102	0.4527	0.6799
1992	0.5683	0.1792	0.5592	0.4104	0.6428
1993	0.6016	0.1811	0.5858	0.3979	0.6211
1994	0.6472	0.1833	0.5480	0.4292	0.6264
1995	0.6549	0.1855	0.5141	0.4102	0.6304
1996	0.6292	0.1949	0.5221	0.4132	0.5802
1997	0.5944	0.2179	0.5119	0.3881	0.5266
1998	0.5980	0.2507	0.4918	0.4252	0.5624
1999	0.6004	0.2554	0.4142	0.3768	0.4782
2000	0.5919	0.2460	0.4390	0.3992	0.5029
2001	0.5676	0.2246	0.4336	0.4164	0.5179
2002	0.5398	0.2344	0.4024	0.4104	0.4851
2003	0.5706	0.2084	0.3856	0.4286	0.5284
2004	0.6245	0.1973	0.3787	0.4636	0.5284

Appendix Table 6: Estimated weights assigned to each competitors of Thailand

Year	Malaysia	Philippines	Indonesia	Singapore	India
1990	0.3363	0.1171	0.2918	0.6923	0.3689
1991	0.3600	0.1234	0.3282	0.6799	0.3346
1992	0.3638	0.1207	0.3667	0.6428	0.3000
1993	0.3593	0.1173	0.3477	0.6211	0.2813
1994	0.3602	0.1077	0.3046	0.6264	0.2840
1995	0.3849	0.1112	0.2986	0.6304	0.3192
1996	0.3672	0.1188	0.2948	0.5802	0.3105
1997	0.3566	0.1380	0.3087	0.5266	0.3237
1998	0.3327	0.1492	0.2765	0.5624	0.2779
1999	0.3882	0.1644	0.2722	0.4782	0.3553
2000	0.3798	0.1570	0.2780	0.5029	0.3282
2001	0.3736	0.1494	0.2832	0.5179	0.3604
2002	0.3750	0.1612	0.2786	0.4851	0.3968
2003	0.3863	0.1411	0.2729	0.5284	0.4037
2004	0.3793	0.1231	0.2538	0.5284	0.3942

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