PROFITABILITY OF INVESTMENT AND EXPORT: EVIDENCE FROM EAST ASIA

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SUSMITA MITRA

CENTRE FOR INTERNATIONAL TRADE AND DEVELOPMENT
SCHOOL OF INTERNATIONAL STUDIES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI 110067
INDIA
2008

CENTRE FOR INTERNATIONAL TRADE & DEVELOPMENT
SCHOOL OF INTERNATIONAL STUDIES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI - 110 067

Tel : 011-2670 4338
Fax : 91-011-2671 7586
Gram : JAYENU

Date: 28.07.08

DECLARATION

I declare that the thesis entitled "Profitability of Investment and Export: Evidence from East Asia" submitted by me for the award of the degree of **Master of Philosophy** of Jawaharlal Nehru University is my own work. The thesis has not been submitted for any other degree of this University or any other university.

Susmita Mitra

SUSMITA MITRA

CERTIFICATE

We recommend that this thesis be placed before the examiners for evaluation.

S Bansal

Dr. Sangeeta Bansal
Chairperson
Chairperson
Centre for International Trade Development
School of International Studies
Jawaharlal Nehru University
New Delhi - 110 067

Dr. Meeta K. Mehra
Supervisor
Associate Professor
Centre for International Trade & Development
School of International Studies
Jawaharlal Nehru University
New Delhi-110067

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Susmita Mitra

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Chapter 1: Introduction

Economic development is the main objective of all countries. Although merely economic growth is not sufficient for economic development, but it is a very important, rather the most important component of economic development.

There was a time when economists associated development with growth and industrialisation. Afterwards, economic development was equated with output growth, and capital formation was identified as the crucial component to accelerate development. The role of savings was important in bringing development through capital formation. Savings could be manipulated by government intervention. Thus, government involvement was regarded as a critical tool of economic development – whether by planning, socio-economic engineering or effective demand management. Later on economists turned to international trade as the great catalyst to growth. Neoclassical school of economists – who relied mostly on market determination rather than government intervention – emphasised on the role of trade or more specifically on the role of exports in bringing economic development through economic growth.

International trade as an 'engine of growth' was not in style during the entire three decades from 1950s to end of 1970s. At that point of time the majority of the developing countries executed industrialisation policies under government protectionism. As a result, Latin American, Asian and African countries were seen mostly as underdeveloped countries. After 1980s it was felt that the inward-oriented policies were no longer sustainable. The poor performance of Latin American countries implementing import substitution strategy was in dramatic contrast to the rapidly growing East Asian countries that had implemented outward oriented strategies (see Appendix 1).

This difference in performance became a topic of policy debate. In the 80s, economists dealing with poorer countries recommended reduction of trade barriers and the opening up of international trade. Moreover, the World Bank and the International Monetary Fund required the developing countries to open up their external sector as a condition for receiving financial assistance.

By using various econometric methods economists tried to prove that openness or trade leads to growth. This is an extensively researched area. There is hardly any corner left to peep in. So, the question arises, why to work in such a well researched area?

1.1 Scope of a new study

In contrast to the view that openness leads to growth, there is another school of thought who believes that role of trade is highly over stated. There are other factors apart from export which also affect growth positively. The number of researches in this area is relatively lesser.

A new addition to this debate is that, it might be the investment boom first causing the export boom. Investment based explanation for a country's growth may be even stronger than trade based explanations. Economists generally relate export growth to economic growth. But focusing only on export policy will not be a wise decision for the developing countries. The investment policy should also get its due importance. But a very few economists have worked upon this. Therefore we want to work in this area.

Rodrik (1995) focused on the investment based argument for two East Asian countries, namely South Korea and Taiwan. He compared the situation with two non East Asian countries Chile and Turkey and concluded that East Asian growth has investment based explanation rather than trade based explanation. But the question arises: can the case study of only these two countries represent the entire East Asia? This is an area where we think a new work can add some value to the ongoing debate.

1.2 Objective

In this thesis our objective is to examine the role of investment in the trade growth relation. But due to lack of information, it is very difficult to study the relation between profitability of investment and export. So we will study the causal relation between investment and openness for all East and South East Asian countries like China, Hong

Kong, Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand. We want to see whether Taiwan and South Korean argument holds for the entire region or there is difference in the trade pattern among these countries also. To support the result there will be a detailed study on the trade policies of the selective East Asian countries.

Along with East Asia we will also study how these variables had performed for another fast growing developing country, India. We want to test causality for pre and post liberalisation periods separately and see whether the relation has changed after the economic reform in 1991 or not.

1.3 Research Questions and Chapters

As discussed above, the thesis addresses three broad research issues:

a. Whether or not investment boom has caused export boom in the entire East and South East Asia
b. A detailed study on the export promotion policies of selective East Asian countries
c. Investment openness causality for India in the pre and post liberalisation era

These issues will be addressed on the basis of country wise secondary data using Granger-causality tool of econometrics.

The thesis consists of six chapters. After this introduction, chapter 2 provides a review of both the theoretical and empirical literatures pertaining to the research issues addressed in this thesis. Chapter 3 presents role of investment in the export growth relation. It consists of a model explaining how export boom can arise from an increase in profitability of investment. Then it finds empirically the relation between investment and openness (export plus import as a share of GDP) for East and South East Asian countries. Chapter 4 presents export promotion policies of selective East Asian countries. Chapter 5 examines investment-openness causality for India. Along with a summery chapter 6 concludes.

Chapter 2: A Review of Literature

Trade and growth is a much-researched area. However, it does not cover all the aspects of trade and development, because development is broader than just growth. Most of the existing literature deals with only growth and the export component of trade. In this section we have tried to present a thematic review of the existing literature on trade/export and growth. This will cover the entire debate on whether or not trade/openness causes growth.

We begin with the supporting view or the Export-led Growth (ELG) theory, which encompasses the following areas: how and when the concept emerged, how to define whether a country has an open policy or not, why openness will bring higher growth and empirical evolution of evidence of the linkages.

We then review the opposing view as to why trade barrier can foster growth, criticism of some previous papers and the literature on other growth enhancing factors apart from export.

Finally, we present a brief review of the literature on the trade-growth debate pertaining to India.

2.1 Openness leads to growth

Multilateral institutions like the World Bank (WB), International Monetary Fund (IMF) and the Organisation for Economic Co-operation and Development (OECD) propagate that openness breeds economic growth. For example, OECD report (1998) states, "More open and outward-oriented economies consistently outperform countries with restrictive trade regimes." According to the IMF report (1997), "Policies toward foreign trade are among the more important factors promoting economic growth in developing countries."

This view is currently widespread among economists as well. Krueger (1998) believes that superior growth performance of countries is associated with outer-oriented trade strategies. According to Stiglitz (1998), external openness like trade ratio or index of price distortion is strongly linked with per-capita income growth. Fischer (2000) states, "Integration into the world economy is the best way for countries to grow."

The idea of trade as an 'engine of growth' is quite old. But it was not popular in the post World War II era when the developing countries just gained independence from the colonial powers. At that time most of the economists used to believe that the best way for these countries to develop is to stimulate Import Substituting Industrialisation (ISI). In the coming subsection we will study how the concept of ELG emerged and gradually attained popularity.

2.1.1 How the concept of 'Openness leads to growth' emerged

The 1950s, 1960s and 1970s were dominated by a protectionist model. The developing countries adopted ISI policies for the manufacturing industries so that domestic producers can grow. At the same time they concentrated on exports of primary products, so that foreign currency could be earned to import capital goods needed for industrialisation.

One of the reasons behind this protectionist policy was infant industry argument. It stated that during the short period when the cost of domestic product was above its import price, a tariff was a socially wanted method to prevent competition from foreign producers and develop domestic industry. During the 50s, economists like Prebisch, Singer and Nurkse had argued that infant industry argument is relevant to the entire manufacturing sector and not just to a single industry (Baldwin, 2003).

Another reason behind the protectionist policy was the deterioration of Terms of Trade (TOT). According to Prebisch (1950, 1951, and 1959) and Singer (1950, 1975) open trade policies would not be appropriate for developing countries because of the low elasticity of demand for primary products in developed countries. This low elasticity

would imply a deteriorating TOT for developing countries so that the growth of the primary sector would have only limited benefits for import capacity.

But the concept of deteriorating TOT for the primary exports faced some criticisms. Prebisch (1950, 1951) had shown that the TOT of United Kingdom (UK) improved in the period 1870-1938. He assumed that TOT of the Less Developed Countries (LDCs) is the reciprocal to the UK's TOT. But the inverse of UK's TOT may not be an appropriate measure of the TOT of LDCs as the former may not be representative of the developed countries' TOT as a whole (Kindelberger 1956, Meier and Baldwin 1957).

Nurkse (1959) cited reasons as to why growing through exports cannot be optimal for developing countries. According to him, export prospect for primary products (which are produced mainly by the developing countries) were poor due to synthetic substitution in the developed countries. At the same time export prospects for labour intensive manufactures were poor because despite low wages, the shortage of trained labour would result in low productivity and high labour costs. He further argued that developed countries would create barriers against the labour intensive exports from LDCs.

In reality import substitution policy performed quite well initially during the 1950s and early 1960s. But later on, as a number of developing countries extended this policy to more and more intermediate inputs and for a longer period than temporary protection, the drawbacks of import-substituting policy became noticeable. The export sectors were forced to pay for high cost domestic inputs. So their profit margins declined. As a result export production declined. By this time a small group of economists suggested alternative trade regimes (Baldwin, 2003).

The multi-country investigations on trade orientation and economic performance of Little et al. (1970), and Balassa (1971) analysed how the protectionist policies had affected the overall economic structure of developing countries. Their general conclusion was that protectionist policy had reduced savings, rate of employment and rate of capacity

utilisation. Thus developing countries should reduce protection and open up to international trade.

Neither Little et al. (1970) nor Balassa (1971) studied the transformation of specific countries from one trade regime to another. They only concluded that developing countries should open up to international competition (Edwards, 1993). So in the next subsections we will study how to define a country's movement from one trade regime to another, how economists concluded that openness leads to growth and also some empirical evidence supporting the view.

2.1.2 How to define whether a country is open or protected / measuring openness

The first systematic attempt to differentiate various trade regimes came from the National Bureau of Economic Research (NBER) studies directed by Krueger (1978) and Bhagwati (1978). They tried to answer what is exactly meant by an export promoting trade strategy. Trade orientation was measured by how much a country's protective structure is biased against exports. This was measured by an index, defined as the ratio of the Effective Exchange Rate paid by importers (EER_M) to the Effective Exchange Rate faced by exporters (EER_X).

The EER_M is defined as nominal exchange rate applied to imports (E_M) multiplied by the average import tariff (t), other import surcharges (n) and the tariff equivalence of quantitative restrictions like import licenses (L) as-

$$EER_M = E_M(1+t+n+L)$$

The EER_X is calculated as the nominal exchange rate applied to exports (E_X) multiplied by export subsidies (s) and other export encouragement schemes (r) as-

$$EER_X = E_X(1+s+r)$$

If the nominal exchange rates are same i.e. $E_M = E_X = E$, then degree of bias of the trade regime is

$$\frac{EER_M}{EER_X} = \frac{E_M(1+t+n+L)}{E_X(1+s+r)}$$

A value of the ratio greater than one implies that for an import worth a dollar a country has to pay more than a dollar, while an export worth a dollar fetches only a dollar. This represents the 'bias against exports'. This is the idea behind import substitution strategy, which creates a net incentive to substitute imports relative to what international prices dictate (Bhagwati, 1988). If the value of the ratio is one, then the bias is fully eliminated, and if the value is less than one then the country is said to follow an export promotion strategy.

The Bhagwati-Krueger project (1978) defined trade liberalisation as a policy reducing anti-export bias. Further this definition allows that a liberalised trade economy can have high tariffs (Krueger, 1978). At the same time, since the definition is based on average incentives, it is possible that a country protects some sectors but does not generally have an anti-export bias (Edwards, 1993).

To study the gradual movement towards liberalisation, the Bhagwati-Krueger project (1978) defined five phases. Phase I is marked by heavy quantitative restrictions and a Balance of Payment (BOP) crisis. To tackle the crisis, phase II witnesses increasing anti-export bias. Phase III is characterised by devaluation of currency and relaxation of some quantitative restrictions, paving the way for liberalisation process. Phase IV is a step further towards liberalisation. In this phase quotas are replaced by tariffs. The economy becomes fully liberalised in phase V where no quantitative restrictions exist. In a nutshell, the first two phases can be termed as protectionist regimes while the last three phases represent different stages of movement towards free trade. Devaluation plays an important role while moving from phase II to III.

Krueger and Bhagwati (1978) econometrically tested two hypotheses, 1) more liberalised regimes result in higher rate of exports growth, 2) more liberalised regimes result in higher rate of aggregate growth. d_1 was the dummy that took the value one in Phases I and II and zero otherwise; d_2 was the dummy which took the value one in Phases IV and V and zero otherwise. Both the hypotheses were tested with linear regressions. The dummy for liberalised regime i.e. d_2 came out to be significant in both the cases.

The World Bank project of Michaely et al. (1991) classified countries in different trade regimes subjectively, by asking individual country authors to build an index of trade liberalisation from 1 (highly protective) to 20 (fully liberalised). Instead of relying on dummy variables to classify different phases, these indices were used as indicators of trade orientation in the linear regression estimation. Like the NBER study directed by Krueger and Bhagwati (1978), Michaely et al. (1991) also concluded that outward looking policy is better. Taylor (1991) criticised these studies by saying that trade liberalisation policy is 'intellectually moribund' and there are no great benefits in following open trade and capital market strategies.

Economists have suggested some reasons for openness to be a better policy regime. We are mentioning a few of them in the next section.

2.1.3 Why openness will bring higher growth

In trade theory there are several reasons to support the Export Led Growth theory:

a) World markets are certainly larger than home markets. Thus export growth increases demand for the exporting country's output.
b) Export promotion brings incentives for domestic resource allocation closer to international opportunity costs and hence closer to what will generally produce efficient outcomes (Bhagwati, 1988).
c) Import substituting strategies are more likely to trigger 'directly unproductive profit-seeking' activities. These activities divert resources from productive use into unproductive but profitable lobbying to change policies. By opening up the economy to international market, losses from these activities can be curbed down (Bhagwati, 1988).
d) Export expansion may reduce foreign exchange constraint (Chenery and Strout, 1966), which makes import of inputs 'easier to meet domestic demand. This enables output expansion.

e) If the country exports certain goods offer the benefits of economies of scale, then export expansion may allow the exploitation of economies of scale, which may lead to increased growth (Krueger, 1980).

f) The outward orientation may also give access to foreign investment, advanced technologies and better management practices (Hart, 1983; Ben-David and Loewy, 1998) that may result in further efficiency gain. Technology spillover can take place through many channels if a country trades. Multi National Companies (MNCs) can usher in new technologies to LDCs. Developing countries can either directly import technology or imitate technology used in advanced countries. Foreign investment into import substituting countries will be self limiting in the long run because they are aimed at home market and therefore constrained by it (Bhagwati, 1988).

2.1.4 Empirical evidences of and econometric analysis on Export led growth

Using the concept of the effective rate of protection, Little *et al* (1970) wanted to compare import substitution policies across industries and countries taking developing nations like Argentina, Brazil, Mexico, India, Pakistan, the Philippines and Taiwan as samples. Quite similarly, the Balassa (1971) project studied Chile, Brazil, Mexico, Malaysia, Pakistan, the Philippines and Norway. Both of them reached the same conclusion that opening up is a better policy for developing countries (Edwards, 1993).

The NBER project directed by Krueger and Bhagwati (1978) studied different phases of policy regimes for countries like Chile, Colombia, Egypt, Ghana, India, Israel, Korea, the Philippines, and Turkey. Following quite similar lines, the individual country-researchers in the Michaely et al. (1991) project constructed an annual index of the degree of trade liberalisation for Argentina, Brazil, Chile, Columbia, Greece, Indonesia, Israel, Korea, New Zealand, Pakistan, Peru, the Philippines, Portugal, Singapore, Spain, Sri Lanka, Turkey, Uruguay, and Yugoslavia. Most of the studies covered the period from around 1950 to the early 1980s. Both the studies by Krueger and Bhagwati (1978) and Michaely

et al. (1991) offered similar conclusion that outward-looking policies are more appropriate for achieving long term growth.

Studies on East Asia reveal that the countries registered slow growth with their inner-oriented trade strategies and quantitative control over imports. But with the opening up of trade they witnessed an accelerated growth rate (Krueger 1990).

There were also cross-country econometric studies in the 1960s and 1970s, which attempted to test the relationship between trade and economic growth. The early and simplest econometric method used was to run correlation between growth as a change in national product and export growth (Emery, 1967; Maizels, 1968; and Kravis, 1970). They found significant correlation between the two and thus supported the Export Led Growth hypothesis. Their process had been criticised on the ground that since exports are a part of national product, a positive correlation is almost inevitable (Michaely, 1977).

As a solution to this problem, Michaely (1977) represented export performance by the extent of export bias i.e. the proportion of exports in the Gross National Product (GNP). The growth rate is represented by the rate of change of per capita product. He took data for 41 LDCs for the time period 1950-1973. He ran correlation between the variables, namely average annual changes of $\frac{export}{GNP}$ and average annual changes in *per capita GNP*. He found the correlation to be significant at the 1% level. Another interesting finding was that the positive association between these two variables was strong among the more developed countries. So he concluded that growth is affected by export performance only once countries achieve some minimum level of development.

Balassa (1978) found a solution in a slightly different way. He ran correlation by considering different variables. Firstly, *export growth* with *growth of GNP*, secondly, *export growth* with *growth of GNP net of export,* thirdly, *incremental* $\frac{export}{GNP}$ with *growth of GNP,* fourthly, *incremental* $\frac{export}{GNP}$ with *growth of GNP net of export,* and

finally, *average* $\frac{export}{GNP}$ with *growth of GNP*. He found all the correlations to be high. He then repeated the work by taking manufactured output instead of GNP. With one exception, the observed correlation was higher for GNP than for manufactured output.

But in general the use of correlation in this kind of estimation is criticised by some economists because of the disadvantage of omitting other relevant variables (Michalopoulos and Jay, 1973). At the same time simple correlation test faces certain limitations -

a. High correlation between two variables (i.e. export growth and economic growth) does not imply that one is the result of the other.
b. The high correlation may be simply a spurious correlation.

Therefore, economists (Michalopoulos and Jay, 1973; Balassa 1978; Tyler, 1981; Feder, 1982; Ram, 1985; Moschos, 1989 and Vohra, 2001) started analysing the role of exports in economic growth in the framework of a production function model that treats export as a production input. They used investment and labour as explanatory variables along with export in an inter-country regression framework. The inclusion of export in a production function-type relationship can be justified on the ground that exports tend to raise total factor productivity for the reasons already mentioned.

The aggregate production function was specified by these economists as:

$$Y = f(L, K, X)$$

Where Y is aggregate real output, L is the labour input, K represents the input of capital, and X measures export.

Taking total derivatives:

$$dY = \frac{\partial Y}{\partial L}.dL + \frac{\partial Y}{\partial K}.dK + \frac{\partial Y}{\partial X}.dX$$

Dividing throughout by Y and manipulating slightly, gives:

$$\frac{dY}{Y} = \frac{\partial Y/Y}{\partial L/L}.\frac{dL}{L} + \frac{\partial Y/Y}{\partial K/K}.\frac{dK}{K} + \frac{\partial Y/Y}{\partial X/X}.\frac{dX}{X}$$

$$\Rightarrow \qquad \dot{Y} = \beta_1 \dot{L} + \beta_2 \dot{K} + \beta_3 \dot{X} (where \beta_1 = \frac{\partial Y / Y}{\partial L / L} etc.)$$

Since growth rate of capital input is usually not known for most of the countries, $\frac{dK}{Y}$ has been used. Adding a constant β_0 and a stochastic term U:

$$\dot{Y} = \beta_0 + \beta_1 \dot{L} + \alpha_2 \frac{I}{Y} + \beta_3 \dot{X} + U$$

In the above equation α_2 is the marginal physical product of capital. β_3 indicates the direction and magnitude of the impact of export expansion on economic performance. Regression analysis has been conducted to study the significance of exports through β_3.

Michalopoulos and Jay (1973) used data for 39 developing countries for the period 1960-66. They found that inter-country differences in domestic and foreign capital and labour growth together explained only 53% of the inter-country variation in GNP growth rates. But after adding an export variable, 71% of the difference could be explained. Thus they concluded that export growth affects and explains GNP growth rate.

Balassa (1978) used the regression designed by Michalopoulos and Jay (1973) to explain inter-country differences in GNP growth rates for 10 countries for an extended period 1966-73. He also found a similar result. The study concluded that export growth favourably affects the rate of economic growth, over and above the contributions of domestic and foreign capital and labour. He calculated the average GNP growth rate for the group as a whole. Comparing the average and individual GNP growth rates it was found that for the countries that adopted export-orientation, the individual growth rate of GNP is higher than the group average. On the other hand, the countries that practiced import substitution showed a GNP growth rate much lower than the group average.

In a similar manner Tyler (1981) employed both correlation and regression procedures to a larger sample comprising of 55 middle-income LDCs. He reached the same conclusion

that there exists a strong cross country association between export performance and GNP growth. He also emphasised like Michaely (1977) that a critical level of development is necessary for a country to extract maximum benefit from export oriented growth.

Ram (1985) wanted to study whether or not the importance of export for economic growth increased during the 1970s after the oil shock. He used a large sample of 73 LDCs for the period 1960-70 and 1970-77 separately. He also categorised the LDCs as low-income and middle-income groups for both the periods. He concluded that export performance does seem important for economic growth. The two time periods demonstrated interesting contrasts. Before 1970 the impact of export expansion was smaller for the low-income LDCs compared to middle-income LDCs. But this impact differential disappeared in the period 1970-77. Thus according to him the conventional wisdom that export performance is unimportant for growth in the low-income LDCs should be abandoned after 1970.

The concept of the basic or critical level of development (to achieve maximum benefit from export oriented growth) has been criticised by Moschos (1989) because it was chosen arbitrarily. He searched and tested for the existence of a critical level of development below and above which there are significant differences. In the absence of a priori information about the critical level, he employed the technique of searching for a critical switching point in a discontinuous regression regime, developed by Quandt (1958). The empirical result of Moschos (1989) suggested that, export expansion performs better in countries below the critical level.

Vohra (2001) did a similar study like Ram (1985) taking 5 Asian countries including India, Pakistan, the Philippines, Malaysia, and Thailand for the time period 1973-93. Though his result also supported that exports have a positive impact on economic growth, it contradicted the conclusion of Ram (1985). Vohra (2001) showed that after the oil shock also the impact of export expansion is significant mainly in the middle-income group countries as they have already achieved some basic level of economic development.

Feder (1982) added a new dimension to the production function approach. According to him, export promoting countries benefit from closer-to-optimal resource allocation and therefore they enjoy higher growth. He tried to explain that there are substantial differences between marginal factor productivity in export (higher) and non-export industries (lower). As export is a high productivity sector, more resource allocated to this segment will direct the movement of resource allocation closer to optimality. He has provided a model to show this. The model is based on few assumptions-

a. There are two sectors in the economy—export and non-export sector.
b. There is positive externality of export production for non-export sector due to development of efficient management, introduction of improved production techniques, training of higher quality labour and steadier flow of imported inputs.

The production functions are:

$N = F(K_N, L_N, X)$ .....(1) and

$X = G(K_X, L_X)$ .....(2) where

N= non-exports,

X= exports,

K_N, K_X = respective sector capital stocks,

L_N, L_X = respective sector labour forces.

Suppose the ratio of respective marginal factor productivities in the two sectors deviates from unity by a factor δ, i.e.

$$\frac{G_K}{F_K} = \frac{G_L}{F_K} = 1 + \delta$$

δ=0 implies an allocation of resources that maximises national output. But in general δ>0 due to a number of reasons. One important reason is that export-oriented firms operate in a more competitive environment. Competition induces innovation,

adaptability, efficient management of firm resources, etc. Other reasons for deviation include various regulations and constraints such as credit and foreign exchange rationing for export-oriented firms. Productivity differentials which are due to externalities are not included in δ.

A differentiation of equations (1) and (2) gives-

$$\dot{N} = F_K \cdot I_N + F_L \cdot \dot{L}_n + F_X \cdot \dot{X} \quad \text{.....(4)}$$

$$\dot{X} = G_K \cdot I_X + G_L \cdot \dot{L}_X \quad \text{.....(5)}$$

Where I_N, I_X are respective sectoral gross investments. $\dot{L}_N, \dot{L}_X$ are sectoral changes in labour force, and F_X describes the marginal externality effect of exports on the output of non-exports.

Denoting Gross Domestic Product by Y, and since by definition Y= N + X, it follows

$$\dot{Y} = \dot{N} + \dot{X} \quad \text{.....(6)}$$

Using equations (3)-(5) in (6) gives

$$\dot{Y} = F_K \cdot I_N + F_L \cdot \dot{L}_N + F_X \cdot \dot{X} + (1+\delta) \cdot F_K \cdot I_X + (1+\delta) \cdot F_L \cdot \dot{L}_X$$

$$= F_K \cdot (I_N + I_X) + F_L \cdot (\dot{L}_N + \dot{L}_X) + F_X \cdot \dot{X} + \delta \cdot (F_K \cdot I_X + F_L \cdot \dot{L}_X) \quad \text{.....(7)}$$

Equations (3) and (5) give

$$F_K \cdot I_X + F_L \cdot \dot{L}_X = \frac{1}{1+\delta} \cdot (G_K \cdot I_X + G_L \cdot \dot{L}_X) = \frac{\dot{X}}{1+\delta} \quad \text{.....(8)}$$

Using (8) in (7) and $I \equiv I_N + I_X$ and $\dot{L} \equiv \dot{L}_N + \dot{L}_X$ finally gives

$$\dot{Y} = F_K \cdot I + F_L \cdot \dot{L} + \left(\frac{\delta}{1+\delta} + F_X \right) \cdot \dot{X} \quad \text{.....(9)}$$

Suppose real Marginal Productivity of labour ($MP_L(F_L)$) is linear to average output per labour i.e.

$$F_L = \beta\left(\frac{Y}{L}\right) \quad \text{.....(10)}$$

Dividing (9) throughout by Y and denoting $F_K \equiv \alpha$ gives

$$\frac{\dot{Y}}{Y} = \alpha \cdot \left(\frac{I}{Y}\right) + \beta\left(\frac{\dot{L}}{L}\right) + \left[\frac{\delta}{1+\delta} + F_X\right] \cdot \left(\frac{\dot{X}}{X}\right) \cdot \left(\frac{X}{Y}\right) \quad \text{.....(11)}$$

This equation implies that GDP growth rate is composed of the contribution of factor accumulation (i.e. growth of capital and labour) and the gains brought about by shifting factors from a low productivity sector (non-export) to high productivity sector (export).

If δ=0, MPs are equal in two sectors and if F_X=0, no inter sectoral externality. Then $\frac{\dot{Y}}{Y} = \alpha\left(\frac{I}{Y}\right) + \beta\left(\frac{\dot{L}}{L}\right)$ which is a neo-classical growth model.

But according to Feder (1982), $\left[\frac{\delta}{1+\delta} + F_X\right]$ is generally non zero for LDCs. He estimated $\frac{\dot{Y}}{Y} = \alpha \cdot \left(\frac{I}{Y}\right) + \beta\left(\frac{\dot{L}}{L}\right) + \nu \cdot \left[\left(\frac{\dot{X}}{X}\right) \cdot \left(\frac{X}{Y}\right)\right]$, where $\nu = \left[\frac{\delta}{1+\delta} + F_X\right]$ and found that ν was positive and significant. It implied that there are substantial differences between marginal factor productivity in high productive export and low productive non-export industries. Export promoting countries benefit from closer-to-optimal resource allocation. This is precisely the reason for their high growth rate.

So far economists have used Ordinary Least Square (OLS) method to study the relation between export and growth. But Lee and Cole (1994) rejected the method to be a lopsided approach. This is because according to them, export is not exogenous. It is dependent on other factors like infrastructure, service sector which affect export positively. According to them single equation model may lead to simultaneous-equation bias. They used OLS method to estimate a standard single equation model first, which

served as a benchmark to test simultaneity bias. Then Hausman's test for exogeneity was used to check whether export is endogenous or exogenous. Result supported that growth rate of export is endogenous. So 2 Stage Least Square (2SLS) estimates were derived and compared with OLS estimates. It was found that 2SLS estimates of the export coefficients were uniformly much larger than the OLS estimates for all the 73 economies, taken in their sample. Therefore, they concluded that single equation model is not optimum to study the effect of exports. In single equation model simultaneity bias leads to under estimation of the role of exports in economic growth.

Frankel et al. (1996) dealt with the endogeneity of trade by using variables like distance, population, common border and common language as exogenous determinants from the gravity model of bilateral trade. Like Lee and Cole (1994), they also concluded that effect of openness on growth is even stronger when corrected for the endogeneity of openness than in standard OLS estimates. They found that trade openness explains the growth of Hong Kong and Singapore to a large extent, while for Korea, Malaysia and Taiwan also the relation between the two is positive, insignificantly though. Besides openness, investment and education were also found to be important factors of growth for countries like Japan, Korea, Malaysia, Singapore and Taiwan.

Simultaneously, there was another concern bothering economists—regression analysis assumes that exports cause growth and not the other way round. But it was necessary to test the causation between exports and growth.

Marin (1992) tried to find out if a causal link between exports and productivity exists for the four developed market economies, namely Germany, UK, US and Japan. His study was based on cointegration and Granger causality techniques. The cointegration test implied that except for the UK, in the other three countries, export, productivity and the TOT move together in the long run, or in other words, they are cointegrated. For all the four countries he found that exports Granger cause productivity, i.e. ELG cannot be rejected.

To test causal relation between export growth and economic growth in developing Asian countries, Ekanayake (1999) applied cointegration and error correction models. He found that in the short run, economic growth causes export growth in most of the cases. But there is strong evidence of long-run Granger causality running from export growth to economic growth in all cases.

Apart from these above mentioned studies which mainly focused on the empirical relationship between trade volumes and economic growth. There are some other studies on trade policies rather than trade volumes. These studies mainly focused on constructing alternative indicators of openness (Dollar, 1992; Sachs and Warner, 1995) and testing the strength of a wide range of openness measures (Edwards, 1998).

Dollar (1992) constructed two separate indices, "index of real exchange rate distortion" and an "index of real exchange rate variability" (DISTORTION and VARIABILITY). According to him, these indices are related to outward orientation. Low level of protection for production inputs brings about a sustainable level of the real exchange rate, which is favourable to exporters. Again, if there is relatively little variability in the real exchange rate, so that incentives are consistent over time, then also it helps exporters. Thus less distortion and less variability, both are linked to outward orientation. Dollar (1992) empirically also found that each of these indices was negatively correlated with growth over the period 1976-85 for a sample of 95 developing countries.

Sachs and Warner (1995) attempted to construct an index of openness that combines information about several aspects of trade policy. The Sachs-Warner (SW) openness indicator is a zero-one dummy, which takes the value 0 if the economy is closed according to any one of the following criteria: if the country had average tariff rates higher than 40%, its nontariff barriers covered on average more than 40% of imports, it had a socialist economic system or a state monopoly of major exports, if its black market premium exceeded 20% during either 1970s or 1980s. The underlying principle for combining these indicators into a single dichotomous variable is that they stand for

different ways in which policymakers can close their economy to international trade. A value of 1 indicates an open economy.

Sachs and Warner (1995) tested the openness index for 79 countries for the period 1970-89. They found the index to be positively related to the per capita GDP. At the same time it was statistically significant also. So, SW openness indicator suggested that openness leads to growth.

Edwards (1998) took an alternative approach to evaluate the strength of the openness-growth relationship by using different existing indicators. He ran regressions of total factor productivity growth on nine alternative indicators of openness: (i) the Sachs-Warner openness index; (ii) the World Bank's subjective classification of trade strategies in World Development Report 1987; (iii) Edward Leamer's (1988) openness index, built on the basis of the average residuals from regressions of trade flows; (iv) the average black market premium; (v) the average import tariffs from UNCTAD via Barro and Lee (1994); (vi) the average coverage of non-tariff barriers, also from UNCTAD via Barro and Lee (1994); (vii) the subjective Heritage Foundation index of Distortions in International Trade; (viii) the ratio of total revenues on trade taxes (exports + imports) to total trade; and (ix) Holger Wolf's regression-based index of import distortions for 1985.

By regressing these nine different measures of openness for the period 1960-90 for 93 developed and developing countries he found that six out of nine measures of openness statistically justified that openness leads to growth. Thus he concludes that there is a significantly positive relationship between openness and productivity growth.

In a recent study, Romalis (2007) examined whether improved access to developed countries' markets raises developing country growth. He used annual data from 1960 to 2000 for all the developing countries and did regression analysis. His results suggested that better access to developed country markets could have a meaningful effect on economic outcomes in developing countries - at least for those willing and able to expand their trade. He also concluded tariffs and more importantly non-tariff barriers badly affect

developing country's trade. So a reduction in these would almost certainly lead to a substantial increase in the trade as well as growth of developing countries. According to him, despite tariff reductions since 1960, trade policy in developed and developing countries still greatly restricts developing country trade, which may substantially harm growth in poor countries.

Thus the economists belonging to Export Led Growth school of thought have tried to establish their view from all the different angles. But economist's belief on Export Led Growth is not universal. "While a relation has been established between export expansion and superior growth performance, we do not fully understand why performance should be much better in export-promotion than in import- substitution regimes" (Kuznets, 1988). In the next subsections we will present the literatures, opposing ELG hypothesis.

2.2 Trade barriers also create growth

Yanikkaya (2002) mentioned that trade liberalisation does not have a simple and unique relationship with growth. He used a large number of openness measures of trade volumes and trade restrictions for a cross section of countries. On one hand, from the estimation results of various trade volume measures he found that there is a positive and significant association between trade openness and growth. But on the other hand, the estimation results for trade barriers suggested a positive and significant relationship between trade barriers and growth.

In endogenous growth models growth is generated by non-diminishing returns to renewable factors of production or by learning-by-doing and other forms of endogenous technological changes. These models assume that lower trade restrictions boost output growth in the world economy as a whole. But at the same time a subset of countries may experience higher growth with restricted trade depending on their initial factor endowments and levels of technological development (Rodriguez and Rodrik, 2000).

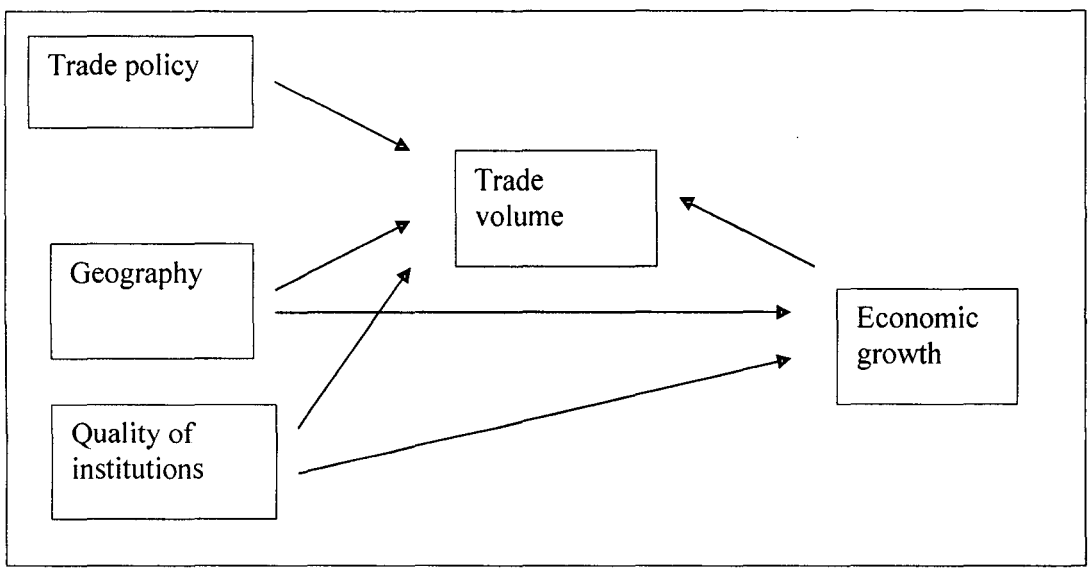
2.2.1 Criticism of some previous works

Economists like Emery (1967), Maizels (1968), and Kravis (1970) ran correlation between growth in national product and export to reach the conclusion of ELG hypothesis. But it is very much possible that the correlation is caused by other factor or factors.

Krueger (1990) points out that, it is difficult to identify the links between export growth and overall growth. This is because various other factors like favourable government policies, education attainment, transport, etc. can lead to the growth of both export and economy simultaneously at the same time frame.

Rodrik (2000) argues about a model like the following diagram.

Diagram 1: Factors Affecting the Correlation between Trade and Growth



In this model, neither trade policy nor trade volume affects economic growth. But still trade and growth are correlated because there are geographical factors and institutions which lead to both higher trade and economic growth.

Factors like increase in world demand or reductions in transport costs are responsible for trade volume growth. Along with these trade policies also affect the volume of trade

positively. But according to Rodriguez and Rodrik (2000) poor economic performance can mar the positive impact these policies have on trade volume. Thus in many cases, the indicators of openness or of trade barriers become highly correlated with the sources of poor economic performance. On this ground they attacked the studies that concluded trade barriers reduce economic growth. The papers they mainly criticised were Dollar (1992), Sachs and Warner (1995) and Edwards (1998). They believed that relationship between openness and growth is dependent on a particular country's internal and external conditions. According to them, the evidence in favour of trade openness has been highly overstated.

Rodriguez and Rodrik (2000) first criticised the two indices of Dollar (1992) i.e. "index of real exchange rate distortion" and an "index of real exchange rate variability" (DISTORTION and VARIABILITY). According to them DISTORTION can be used as a measure of trade restriction if there is no price distortion, export tax, subsidy, etc. So before testing for such an index, all these conditions have to be checked. The ten countries with the highest VARIABILITY in Dollar (1992) are Iraq, Uganda, Bolivia, El Salvador, Nicaragua, Guyana, Somalia, Nigeria, Ghana, and Guatemala. According to Rodriguez and Rodrik (2000) these countries experienced very high inflation rates and/or severe political disturbances during the period 1976-85. It is possible that VARIABILITY index was highly influenced by these economic instabilities at large. So they questioned the authenticity of DISTORTION and VARIABILITY as indicators of trade orientation.

Rodriguez and Rodrik (2000) also criticised the Sachs-Warner dummy. Sachs and Warner (1995) found that strength of the dummy comes mainly from the two variables – black market premium and the state monopoly of exports. But Rodriguez and Rodrik (2000) opined that these were not proper measures of trade policy. On the contrary, the two variables that were the most direct measures of trade policy, namely tariff and non-tariff barriers came out to be insignificant in Sachs and Warner (1995).

Rodriguez and Rodrik (2000) reworked the Edwards (1998) paper with more recent data. This recalculation failed to confirm that openness leads to growth as suggested by Edwards (1998) earlier.

The main concern of Rodriguez and Rodrik (2000) was that effects of trade liberalisation may be helpful on standard comparative-advantage grounds but integration into the world economy can't be a substitute to the development strategy. The United States industrialised and flourished by imposing high import duties on manufactures for much of the later part of the nineteenth century. The remarkable performances of industrialisation achieved by the Soviet Union in the 1920s and 1930s and by China after 1949 by pursuing inward-looking policies are historical examples (Baldwin, 2003).

There is also prospect for Growth Led Exports. According to Lancaster (1980) and Krugman (1984), economic growth enhances skills and technology. This increases efficiency and creates comparative advantage for the country. Thus export is facilitated. The result of the Vector Auto Regressions (VAR) suggested by Harrison (1995) indicates that higher growth rates lead to more open trade regimes.

Henriques and Sadorsky (1996) dealt with the causal relation between export and growth. They repeated Marin's (1992) work with another developed country – Canada. They found evidence that real Canadian exports, real Canadian Terms of Trade and real Canadian GDP are cointegrated, i.e. there exists a long run steady relationship among these variables. But their empirical evidence from a VAR supported the growth-driven exports hypothesis. They found no evidence supporting the ELG hypothesis. On a very similar line, for Austria, Kunst and Marin (1989) concluded that economic growth paves the way to higher exports.

There are also some other factors apart from export which contribute to economic growth. These should not be overlooked. In the next subsection we provide some literature surveys on this.

2.2.2 Other growth enhancing factors apart from exports

Government intervention

Economists often stressed on government intervention as a harbinger of higher economic growth (Amsden, 1989; Wade, 1990). A review of both analytical models and historical evidence supports a strong role of the government. But at the same time they also mentioned that intervention has to be selective.

Ram (1986) used Feder's (1982) model in a slightly different form, with two sectors, namely government and non-government and concluded that government size has a positive effect on economic performance and growth. Ram (1987) included government expenditure as a separate regressor to explain economic growth and found that it also affects growth significantly.

According to Krueger (1990), to achieve the desired growth in the field of export, all the government policies in East Asian countries (like Hong Kong and Singapore) were directed towards export promotion. The government provided with the entire infrastructure necessary for export, for example, good ports, convenient transport, easy communication, etc. In addition to these, abundant labour and a well-functioning labour market facilitated the export sector.

Quite same logic is given by Lee and Naya (1988). "An outward-oriented development strategy adopted in these countries (East Asian) in the early 1960s has created a right atmosphere, making it possible to realise efficient allocation of resources and dynamic gains from trading with the rest of the world. However, in addition to adopting the strategy, governments have directly intervened with markets where deemed necessary for economic growth and export expansion."

The importance of government intervention is also found in Sen's (1983) argument. According to him the highest per capita growth rates among the low income countries (per capita income below $ 400 according to World Bank's World Development Report,

1982) were achieved by China, Pakistan, Sri Lanka, and among the middle income countries by Romania, South Korea, and Yugoslavia. In all of these countries the government had intervened extensively.

Geographical component

Frankel and Romer (1999) recognised the effect of geographical component on the relationship between trade volume and income level. Their paper focused on the component of trade that is facilitated by geographical factors. They found that some countries trade more just because they are near well-populated countries and some trade less because they are isolated. So they concluded that the trade volume of a country is not determined exogenously. As a result, correlation between trade and income cannot identify the effect of trade.

Import

Lawrence and Weinstein (1999) found Import Led Growth rather than ELG for Japan and South Korea. They estimated regression equation taking Total Factor Productivity (TFP) growth as dependent variable and found that it is the import, not export that enhanced TFP growth for the two countries. At the same time they found that lagged TFP is highly correlated with exports, which implies that productivity growth causes export growth, not the reverse.

Domestic investment

According to Boltho (1996) there is no doubt that exports played a significant role for Japan in earlier years. But for the period 1952-73 he found some evidence that growth was not Export-Led. Growth in these years was driven by internal forces, like investment. Helliwell (1992) also emphasised that investment rates in physical capital matters significantly in explaining growth differences among the Asian economies.

Bradford and Chakwin (1993) worked on two possible interpretations of the trade-output correlation. The first one is the general view that, increase in exports causes output expansion. The second approach highlights the role of investment in determining output

growth. They took the case study of Hong Kong, Japan, South Korea, Singapore and Taiwan for the period 1969-89 and applied Vector Auto Regressive technique for both the models.

In the first model they considered exports to be the exogenous variable affecting all other variables. Despite this the analytical evidence demonstrated that investment is exogenous in this model. So they formed the second model assuming investment to be the strategic variable and exports are passive and correlated with output only through investment. Their results of the second model provided evidence that exports are affected by investment through a rise in the volume of output. So Bradford and Chakwin (1993) found that East Asian growth is not export led. It is investment which led to output growth, and export grew only as a result.

Frankel et al. (1996) dealt with the endogeneity of trade by using variables like distances, populations, common borders and common languages as exogenous determinants from the gravity model of bilateral trade. They concluded that effect of openness on growth is even stronger when corrected for the endogeneity of openness than in standard OLS estimates. Apart from openness they found investment and education as important explanatory variables for few countries like Japan, Korea, Malaysia, Singapore and Taiwan.

Kuznets (1988) studied East Asian model of economic development for three countries namely Japan, Taiwan and Korea. He found four main characteristics (apart from export expansion) explaining the extraordinary growth. They are high investment ratios, small public sectors, competitive labour markets, and government intervention. Large and efficient investments in human capital and well developed capacities to absorb new technology are also two very important characteristics. Balassa (1988) also studied the determinants of the favourable performance of the East Asian countries and reached quite a similar conclusion that government intervention, well functioning labour and capital market and private investment are the main ingredients of successful economic performance.

According to Rodrik (1995) internal factors like investment affect trade, not the vice versa. He argued that nothing in theory or in the experience of other countries suggests that export would necessarily pull investment up. According to him, if the domestic capital goods industry is poorly developed and capital goods are mostly imported then increase in investment is possible through increase in imports. If the country can't borrow freely from the world market, an increase in exports is mandatory to pay for the imports. And this can happen even without any significant exchange rate depreciation. He considered South Korea and Taiwan as his case study. With the Granger causality test, he proved that in both the countries investment has caused trade, not the other way round.

Recent works by Kawai (2004) Johnson (2006) talk about trade and Foreign Direct Investment in East Asia. FDI is a separate vast area which needs to be dealt with in another paper. So we are keeping FDI out of our purview. In the next subsection we present very briefly the ongoing trade-growth debate in India.

2.3 Review of literature on trade and development particular to India

East Asia is the most prominent example provided by economists while talking about free trade policy. Compared to the East Asian countries India was a latecomer in the realm of economic reforms. In the early sixties when East Asian countries like South Korea and Taiwan had already adopted export promotion policy India followed ISI as a strategy of economic growth. At this stage India's motive was self-sufficient growth. The "new economic policy" originated in the mid 1980s evoked the debate on ELG in India. Some economists felt that protectionist policies were responsible for the demand deficiency and resulted into stagnation in the manufacturing sector since mid 1980s (Ahluwalia, 1985; Joshi and Little, 1987 and Dhar, 1989). Economists attributed the economic growth after 1980s to the new more open policy.

Nidugala (2000) used production function framework by taking export as an input. He tried to find empirically, the role of exports in India's economic growth by using regression analysis. The finding made it clear that export growth was not significant for

the GDP growth in the period from 1961-62 to 1979-80, but had a significant impact on GDP growth in 1980s. So he concluded that ELG hypothesis holds for India, particularly in the 1980s. Further, he highlighted that growth of manufactured exports had a significant positive relationship with GDP growth, while exports of primary goods had no such influence.

The two-way causation between exports and economic growth has been studied by Nandi and Biswas (1991) in the Indian context, for the period 1960-1985. Their econometric result showed that, there is only one way causality from export growth to income growth. So according to them the ELG hypothesis holds true for India quite prominently.

But Chandra (2002) found evidence of bi-directional causality between real export growth and real GDP growth in India. He provided reasons for this relationship. According to him expansion of productive capacity through income growth can raise exports. At the same time increase in the profitability of export sector can raise the saving rate and capital accumulation in the economy, giving rise to high economic growth. He also found that higher export growth leads to higher non-export GDP growth, which led him to conclude that export growth has spill-over effect in India. Thus according to him export promotion strategy can positively promote overall growth even for a large country like India.

Dhawan and Biswal (1999) examined whether the ELG hypothesis holds true for India or not for the time period 1961–93. They used a multivariate framework and applied Johansen's cointegration test for three variables – real GDP, real exports and TOT. They found one long-run equilibrium relationship between the three variables. They observed the causal relationship to be flowing from GDP and TOT to exports in the long run and exports to GDP in the short run.

Konya and Singh (2006) aimed to study whether India experienced export/import-led growth, or growth-driven export/import, both or none during the 54 years of planning—1951-52 to 2003-04. They found that export and import, both jointly and individually

Granger cause GDP. This result supports ELG for India. They also concluded that growth-driven export/import hypothesis does not seem probable for India.

On the other hand, the new economic policy of the 1980s faced intellectual opposition from a large group of economists (Chakravarty, 1987; Singh and Ghosh, 1988; Kumar, 1992). They argued that although the main constraint to Indian growth is low demand, which can be broken internally also. They argued for an alternative agriculture-led industrialisation strategy.

Chakravarty (1987) highlighted the expansion of internal, rather than external demand. He argued that if a large-scale public investment is made in irrigation and other agricultural–related infrastructure, then agricultural sector will flourish. This growth will increase demand for manufacturing goods. Thus the demand constraint for the manufacturing sector can be broken internally also.

According to Storm (1997) increase in manufacturing exports can not be a solution alone. He concluded that if non-agricultural export has to sustain without inflation then it needs to be supplemented by adequate policies which will increase agricultural output and income.

Using a vector autoregressive (VAR) model Asafu-Adjaye et al. (1999) tested causality between three variables — exports, real output and imports for the period 1960-1994 for India. They found no evidence of causality between these variables and thus concluded that ELG hypothesis does not hold for India.

Sharma and Panagiotidis (2004) contributed to the existing literature by adding post-liberalisation data (1991-2001) to examine the effects of liberalisation on export and output growth. Taking the complete period—1971-2001—at a time they could not find evidence that exports Granger cause GDP, using both measures of GDP (GDP with exports and without exports). They also repeated the same causality test for investment and exports and found that exports do not Granger cause investment.

After doing the survey on the secondary literature we find that supporting ELG hypothesis is a much researched area. But economists who oppose the ELG theory point out that focusing only on export policy will not be a wise decision for the developing countries. In this area Rodrik (1995) points out the interesting causal relation in East Asia, namely, investment boom causing export boom.

While aiming to take another look at East Asia, Rodrik (1995) tested his model empirically for only two countries, Taiwan and South Korea. We will study the causal relation between investment and openness for all East and South East Asian countries.

We will test the same causality between investment and openness for India also. Among the literatures on India, relation between openness and investment has not gained much attention. Sharma and Panagiotidis (2004) did causality test between investment and exports as a part of their work. But they have taken the entire pre and post liberalisation period together. We want to test for both the periods separately and see whether the relation has changed after the economic reform in 1991 or not.

Chapter 3: Model, Data and Method

In our literature review we found that most of the studies conform to the view that export orientation enables growth by allowing imports to increase. But the new dimension to the existing literature on the export led growth theory is that this is not the ultimate determinant of growth. Growth requires investment, which in turn is determined by the profitability of investment. Therefore, the reasons for accelerated growth must be traced back to the causes behind the rise in the profitability of investment. Rodrik (1995) provides a comprehensive model explaining the probable causality for increased profitability of investment. He also empirically tested the two competing hypotheses of export led growth and investment led growth for two East Asian countries, South Korea and Taiwan. He compared the results with those for two non East Asian countries, Chile and Turkey. This comparison led to the conclusion that East Asian growth has an investment based explanation rather than a trade based explanation.

In this chapter we explain Rodrik's model in detail, and then proceed to describe the data and method used to test these two competing hypotheses for some other East Asian countries.

3.1 Model

The catch line of the model is: *If the domestic capital goods industry is poorly developed, then an increase in investment becomes possible only through an increase in imports. If the economy cannot borrow freely from abroad, then an increase in exports is required to pay for the imports.*

The model also explains that this situation does not need much change in the relative price of exportables. It also compares export booms that arise from an increase in relative profitability of investment to those that arise from government policies. The second types of export booms are inferior in the sense, that they increase the relative price of exportables.

Now, increase in export supply can happen if there is an exogenous increase in the savings rate or change in the inter-temporal relative prices which induce businessman and household to save more. One question that arises now is: What guarantees demand for these exports? The small country assumption provides the answer on the demand side. For small countries, the demand curve for exportables is horizontal, or in other words, demand elasticity for exportables is infinity.

Assumptions of the model:

1. There are at least two time periods in an economy. As we are studying investment behaviour, the model should deal with at least two time periods. Investment is made in the first period only, and the second period is the final stage.
2. The economy produces and consumes two goods in the first period: an exportable and a non traded good. At least two goods are required in the first period as we are studying relative prices within that period. (for only the model in this chapter, we are using an exportable and a non-tradable good, otherwise we will the plural form, exports and imports)
3. There is a third good, capital good, which is imported. Its world price is **q**
4. Only the tradable good is consumed and produced in the second period.
5. World prices of all consumption goods is unity. In the first period when there is subsidy on exports, domestic price of the exportable becomes **1+ S**. Let **P** be the price of non traded goods. Therefore real exchange rate is

$$\Pi = \frac{1+S}{P} \quad \text{.....(1)}$$

6. Let **r** be the real interest rate. Therefore $\delta = \frac{1}{1+r}$ is the discount factor.
7. In the model there are three relative prices-

   Exportable to importable: $\frac{1+S}{q}$

   Inter temporal relative price: $\delta = \frac{1}{1+r}$

Real exchange rate: $\Pi = \frac{1+S}{P}$

3.1.1 Consumer's side

In the general equilibrium model consumer's side explains the demand side. Consumer's behaviour is captured by expenditure function E(1+S,P,δ,W), which is the minimised present discounted value of consumption expenditure required to achieve utility level W. This expenditure function is homogeneous of degree one in all prices.

Partial derivative $E_i(\ .\ )$ gives compensated demand for the i^{th} good. Compensated demand curves slope downward, i.e. $E_{ii} < 0$. All the goods are assumed to be compensated substitutes, if price of one good increases, consumers will substitute by the other good, so demand for the other good will increase i.e. $E_{12}(\ .\ ) \geq 0$, $E_{23}(\ .\ ) \geq 0$.

3.1.2 Producer's side

In the general equilibrium model producer's side explains the supply side and determines investment. Producer's behaviour is articulated by the revenue function of the form R^1 (1 + S, P, K) and R^2 (1, K + I, θ). These provide the maximised value of Gross Domestic Product (GDP) when producers confront prices which are 1 + S and P (for tradable and non tradable good in the 1st period) and 1 (for only the tradable good in the second period). Economy's fixed capital stock is K (in the 1st period) and K + I (in the 2nd period). θ is the exogenous increase in the productivity of capital, which increases revenue of the second period directly, as well as indirectly by increasing the rate of increase in revenue due to increase in capital.

$R^2_\theta(\ .\ ) > 0$, $R^2_{K\theta}(\ .\ ) > 0$.

The revenue function is homogenous of degree one in prices. Its partial derivatives with respect to prices give the supply of that relevant good. Moreover, the behaviour of revenue functions is assumed as

$R^{1}_{11}(.) > 0,\ R^{1}_{22}(.) > 0,\ R^{1}_{12} < 0$

i.e. if price of one good increases, its supply increases, but the supply of other good decreases.

Economy's initial capital stock is fixed at K. Producers decide on the investment by maximising the difference between present discounted value of the 2nd period GDP and present investment cost. This is because, the cost of the investment is incurred in the 1st period but the gain is experienced in the 2nd period.

Max

I $\quad \delta R^{2}(1, K+I, \theta) - qI$

$\Rightarrow \quad \delta R^{2}_{K}(1, K+I, \theta) = q$ .....(2)

It implies investment is a function of δ, q, θ ; given the stock of capital (K) exogenously.

3.1.3 Equilibrium

Export subsidy has to be financed by an equivalent tax as the economy can't borrow freely from the world. The tax is assumed to be a lump sum one. Let X stand for 1st period's exports. Then the inter-temporal resource balance constraint is

$$E(1+S, P, \delta, W) + qI = R^{1}(1+S, P, K) + \delta R^{2}(1, K+I, \theta) - SX \quad \text{.....(3)}$$

In the above equation the left hand side represents the present discounted value of total expenditure (consumption + investment). The right hand side represents the present discounted value of income (production revenue – tax).

Since the economy can't borrow from or lend to the world market freely, income-expenditure identity has to hold in each of the two periods separately. The budget

constraint of only one period is considered. Rodrik (1995) took the 2nd period is taken). Why?(I can't answer)

$$E_{\delta}(1+S,P,\delta,W) = R^{2}(1,K+I,\theta) \quad \text{.....(4)}$$

Equilibrium for the non-traded good—

$$E_{2}(1+S,P,\delta,W) = R_{2}^{1}(1+S,P,K) \quad \text{.....(5)}$$

In the above equation the left hand side represents the demand and the right hand side represents the supply.

The volume of exports in the 1st period as derived by Rodrik (1995)

$$X = R_{1}^{1}(1+S,P,K) - E_{1}(1+S,P,\delta,W) \quad \text{.....(6)}$$

In the above equation the 1st term of the right hand side represents the supply of exportables and the 2nd term represents the domestic demand for exportable. This equation implies that if investment increases due to an exogenous increase in the productivity (θ), then domestically only supply of exportable increase not the demand. As a result exports increase. In the model there are 6 equations to solve for 6 endogenous variables- Π, W, P, I, δ and X.

3.1.4 Comparing two export increasing situations

In the model exports can be increased in either of the two ways:

a) Increasing subsidy (S) as an export-oriented policy of the government or,
b) Through an exogenous increase in the profitability of investment i.e. increase in θ

The model compares the effects of $d\theta > 0$ and $dS > 0$ in two situations, with and without non tradable goods.

For a quick comparison, the outcomes of the two policies are given below in a tabular form. This will be followed by the mathematical derivations.

Table 1: A Comparison of the Outcomes of Increase in θ and S

Increase in θ	**Increase in S**
Investment (I) increases conditionally (if and only if r does not increase much)	Investment (I) increases conditionally (if and only if r falls and δ increases)
r increases and δ falls	r falls and δ increases
$\frac{1+S}{q}$ is unchanged	$\frac{1+S}{q}$ increases
Effect on $\frac{1+S}{P}$ is ambiguous in the presence of non tradable goods	$\frac{1+S}{P}$ increases i.e. real exchange rate depreciates
Income effect is positive, i.e. W increases	Income effect is zero, i.e. W does not change

In a nutshell, all the effects of a change in θ demonstrate that when investment increases due to a rise in profitability of investment, export will increase with no change in relative prices between exportable to importable, and change in the real exchange rate is ambiguous. According to Rodrik (1995) this is a special characteristic of East Asian growth which is different from other non East Asian countries.

Effect of θ in the absence of the non tradable good

In the absence of the non tradable good, there are 4 endogenous variables W, I, δ, X . So the model shrinks to-

a) $\delta R_K^2(1, K+I, \theta) = q$ (Investment determining equation)

b) $E(1+S, \delta, W) + qI = R^1(1+S, K) + \delta R^2(1, K+I, \theta) - SX$ (Inter temporal resource balance constraint)

c) $E_\delta(1+S, \delta, W) = R^2(1, K+I, \theta)$ (Budget constraint of second period)

d) $X = R_1^1(1+S,K) - E_1(1+S,\delta,W)$ (Export supply equation)

a), b), c), d)..... (8)

Effect of θ on relative prices of exportable to importable (intuitive)

The subsidy S is given in the first period and q is exogenous, thus the effect of θ, which occurs in the second period, can not affect $\frac{1+S}{q}$. In this situation, due to a rise in θ investment increases and as a result export also increases. You are just stating it—this doesn't make it true. (please confirm, whether this logic is sufficient or not, I am not able to think beyond this logic)

Effect of θ on income (effect on W)

Since we focus on income effect of θ, we consider all the other factors to be constant. Thus differentiating 8b) and setting S=0, dI=0, dδ=0

$$E_W dW = \delta R_\theta^2 d\theta$$

$$\Rightarrow \frac{dW}{d\theta} = \frac{\delta R_\theta^2(+)}{E_W(+)} > 0 \quad \text{..... (9)}$$

It implies a positive income effect of θ.

Effect of θ on δ and I

Differentiating 8a) and 8c) we get:

$$R_K^2 d\delta + \delta R_{KK}^2 dI = -\delta R_{K\theta}^2 d\theta \text{ and}$$

$$E_{\delta\delta} d\delta + E_{\delta W} dW = R_K^2 dI + R_\theta^2 d\theta$$

The second equation gives

$$E_{\delta\delta}d\delta + E_{\delta W}\frac{\delta R_\theta^2}{E_W}d\theta = R_K^2 dI + R_\theta^2 d\theta$$

$$\Rightarrow E_{\delta\delta}d\delta - R_K^2 dI = \left[1 - \delta\frac{E_{\delta W}}{E_W}\right]R_\theta^2 d\theta$$

since $\left(\begin{array}{l} E_W = E_{1W} + \delta E_{\delta W}(\mathrm{P}\,DV) \\ 1 = \dfrac{E_{1W}}{E_W} + \delta\dfrac{E_{\delta W}}{E_W} \\ \therefore 1 - \delta\dfrac{E_{\delta W}}{E_W} = \dfrac{E_{1W}}{E_W} \end{array}\right)$

$$\therefore E_{\delta\delta}d\delta - R_K^2 dI = \frac{E_{1W}}{E_W}R_\theta^2 d\theta$$

So we have $R_K^2 d\delta + \delta R_{KK}^2 dI = -\delta R_{K\theta}^2 d\theta$ and

$$E_{\delta\delta}d\delta - R_K^2 dI = \frac{E_{1W}}{E_W}R_\theta^2 d\theta$$

Writing the two equations in matrix form:

$$\begin{bmatrix} R_K^2 & \delta R_{KK}^2 \\ E_{\delta\delta} & -R_K^2 \end{bmatrix}\begin{bmatrix} d\delta \\ dI \end{bmatrix} = \begin{bmatrix} -\delta R_{K\theta}^2 d\theta \\ R_\theta^2\dfrac{E_{1W}}{E_W}d\theta \end{bmatrix} \quad \text{.....(10)}$$

Where the determinant is

$$\begin{vmatrix} R_K^2 & \delta R_{KK}^2 \\ E_{\delta\delta} & -R_K^2 \end{vmatrix} = -\left(R_K^2\right)^2 - \delta E_{\delta\delta}R_{KK}^2 \quad \text{.....(11)}$$

= A (say)

A < 0 because of $\left[E_{\delta\delta} < 0, R_{KK}^2 < 0\right]$

$$dI = \frac{\left[R_K^2 R_\theta^2 \frac{E_{1W}}{E_W} d\theta + \delta E_{\delta\delta} R_{K\theta}^2 d\theta \right]}{A}$$

$$\Rightarrow \frac{dI}{d\theta} = \frac{1}{A}\left[\delta E_{\delta\delta} R_{K\theta}^2 + R_K^2 R_\theta^2 \frac{E_{1W}}{E_W} \right] \quad \text{.....(12)}$$

$$= (-)[(-)+(+)]$$

$$= \quad (+) \text{ first term} + (-) \text{ second term}$$

The sign is indeterminate because there are two contradictory effects. The first term expresses the direct effect of the increase in profitability of investment, which tends to push investment up. The second term captures a more understated effect. Consumption increases at present from the expectation of the future income. But since consumers cannot borrow from abroad, this will raise the real interest rate. This in turn reduces the incentive to invest.

The net effect on investment (and the first period's exports) will be positive as long as the equilibrium increase in the real interest rate is not too large.

Increase in r implies fall in δ

$$d\delta = \frac{\left[\delta R_K^2 R_{K\theta}^2 d\theta - \delta R_{KK}^2 R_\theta^2 \frac{E_{1W}}{E_W} d\theta \right]}{A}$$

$$\frac{d\delta}{d\theta} = \frac{\delta\left[R_K^2 R_{K\theta}^2 - R_{KK}^2 R_\theta^2 \frac{E_{1W}}{E_W} \right]}{A} \quad \text{.....(13)}$$

$$= \frac{(+)-(-)(+)}{(-)} \quad < 0$$

Thus r increases and δ falls. If increase in r is not massive, investment increases due to a rise in exogenous increase in the profitability.

Effect of increase in S

If S increases, it directly affects $\frac{1+S}{q}$. The relative price of exportables to importables in the first period increases due to an increase in S.

We now derive the effect of increase in S on W.

(3) Gives

$$E(1+S,\delta,W)+qI = R^{1}(1+S,K)+\delta R^{2}(1,K+I,\theta)$$

Differentiating totally

$$E_{S}dS + E_{\delta}d\delta + E_{W}dW + qdI = R^{1}_{S}dS + \delta R^{2}_{K}dI + \delta R^{2}_{\theta}d\theta - SdX - XdS$$

To see the effect of small export subsidy S is kept at 0 to start with. If we put S=0, δ has no meaning, because price is 1 in both the periods. dθ = 0, since θ is constant.

$$\therefore E_{W}dW + qdI = \delta R^{2}(1,K+I,\theta)dI$$

From (2) $q = \delta R^{2}(1,K+I,\theta)$

∴ We have dW= 0

This states that a small export subsidy has no first order effect on real income or in other words income effect is zero.

To see what happens to investment, (2) is totally differentiated.

$$\delta R^{2}_{KK}dI + R^{2}_{K}d\delta = 0$$

$$\therefore \frac{dI}{d\delta} = -\frac{R_K^2}{\delta R_{KK}^2} = \psi(say) \quad \text{.....(14)}$$

$$= (-)\frac{(+)}{(-)} > 0$$

It implies that the effect of an increase in the subsidy on investment depends on the interest rate changes. If rate of interest falls, i.e. δ increases, then investment will increase. Therefore, the effect on δ has to be seen first. From equation (4) and (5) we get the effect on δ and P.

(4) Gives

$$E_3(1+S,P,\delta,W) = R^2(1,K+I,\theta)$$

Differentiating totally with respect to P and δ

$$E_{31}dS + E_{32}dP + E_{33}d\delta = R_K^2 dI$$

$$\Rightarrow E_{32}dP + E_{33}d\delta - R_K^2\psi d\delta = -E_{31}dS$$

$$\Rightarrow E_{32}dP + (E_{33} - R_K^2\psi)d\delta = -E_{31}dS \quad \text{.....(i)}$$

(5) gives

$$E_2(1+S,P,\delta,W) = R_2^1(1+S,P,K)$$

Differentiating totally with respect to P and δ

$$E_{21}dS + E_{22}dP + E_{23}d\delta = R_{21}^1 dS + R_{22}^1 dP$$

$$\Rightarrow E_{22} - R_{22}^1 dP + E_{23}d\delta = \left(R_{21}^1 - E_{21}\right)dS \quad \text{.....(ii)}$$

Arranging (i) and (ii) in matrix form-

$$\begin{bmatrix} E_{32} & E_{33} - R_K^2\psi \\ E_{22} - R_{22}^1 & E_{23} \end{bmatrix} \begin{bmatrix} dP \\ d\delta \end{bmatrix} = \begin{bmatrix} -E_{31}dS \\ \left(R_{21}^1 - E_{21}\right)dS \end{bmatrix}$$

The determinant-

$$(E_{32})^2-(E_{22}-R_{22}^1)(E_{33}-R_K^2\psi)=\Delta(say)$$

$$\Rightarrow \Delta=(E_{32})^2-E_{22}E_{33}+R_{22}^1E_{33}+R_K^2\psi E_{22}-R_K^2\psi R_{22}^1$$

Clearly the sign is conditional. It depends on the strength of own price effects E_{22}, E_{33} and cross price effect, i.e. the term $(E_{32})^2$.

Using Cramer's rule-

$$d\delta=\frac{1}{\Delta}\left[E_{32}(R_{21}^1-E_{21})dS+E_{31}dS(E_{22}-R_{22}^1)\right]$$

$$\Rightarrow \frac{d\delta}{dS}=\frac{1}{\Delta}\left[E_{32}(R_{21}^1-E_{21})+E_{31}(E_{22}-R_{22}^1)\right]$$

$$=\frac{(+)[(-)-(+)]+(+)[(-)-(+)]}{\Delta}$$

$$=\frac{(+)(-)+(+)(-)}{\Delta}$$

For $\frac{d\delta}{dS}$ to be > 0, Δ has to be negative. (Sufficient condition for Δ to be negative is that cross price effect has to be weaker than own price effects, i.e. $(E_{32})^2-E_{22}E_{33}<0$)

Under this condition $\frac{d\delta}{dS}>0$ .....(a)

$$dP=\frac{1}{\Delta}\left[-E_{31}dSE_{23}-(R_{21}^1-E_{21})(E_3-R_K^2\psi)dS\right]$$

$$\frac{dP}{dS}=\frac{1}{\Delta}\left[-E_{31}E_{23}-(R_{21}^1-E_{21})(E_{33}-R_K^2\psi)\right]$$

$$=\frac{-(+)(+)-\{(-)-(+)\}\{(-)-(+)\}}{\Delta}$$

$$=\frac{(-)-(-)}{(-)}>0[\text{since}\,\Delta<0]$$

$\frac{dP}{dS} > 0$ .....(b)

(a), (b).....(17)

Therefore, effects of the subsidy on the discount factor and on non-tradable price are unambiguous. Due to an inter-temporal shift in expenditures towards the future r falls leading to a rise in δ. Export subsidy makes the exportables more expensive at home. Thus the consumers switch their demand towards non tradable goods of the 1st period as well as tradable goods in the next period. Thus P and δ both increase.

Effect of S on real exchange rate

We have found that due to an increase in S, P also increases. Thus in the expression of real exchange rate $\frac{1+S}{P}$, both numerator and denominator increase. For real exchange rate to depreciate or $\frac{1+S}{P}$ to rise we need

$$o < \frac{dP}{P} < \frac{dS}{S}$$

Since we are talking about a small increase in S, or in other words we start from S = 0, the condition boils down to $0 < \frac{\frac{dP}{P}}{dS} < 1$

This requires-

$$\frac{dP}{dS}.\frac{1}{P} > 0$$

$$\Rightarrow \frac{1}{\Delta P}\left[-E_{31}E_{23} - \left(R^{1}_{21} - E_{21}\right)\left(E_{33} - R^{2}_{K}\psi\right)\right] > 0$$

$$\Rightarrow \left[-E_{31}E_{23} - \left(R^{1}_{21} - E_{21}\right)\left(E_{33} - R^{2}_{K}\psi\right)\right] > P\left[\left(E_{32}\right)^{2} - \left(E_{22} - R^{1}_{22}\right)\left(E_{33} - R^{2}_{K}\psi\right)\right]$$

Rearranging terms-

$$-\left(R_{21}^{1}-E_{21}\right)\left(E_{33}-R_{K}^{2}\psi\right)+\left({}^{P}E_{22}-{}^{P}R_{22}^{1}\right)\left(E_{33}-R_{K}^{2}\psi\right)>{}^{P}\left(E_{32}\right)^{2}+E_{31}E_{32}$$

$$\Rightarrow\left(E_{33}-R_{K}^{2}\psi\right)\left[{}^{P}E_{22}-{}^{P}R_{22}^{1}+E_{21}-R_{21}^{1}\right]>E_{32}\left[{}^{P}E_{32}+E_{31}\right]$$

$$\Rightarrow\left(E_{33}-R_{K}^{2}\psi\right)\left[\left({}^{P}E_{22}+E_{21}\right)-\left({}^{P}R_{22}^{1}+R_{21}^{1}\right)\right]>E_{32}\left[{}^{P}E_{32}+E_{31}\right]$$

$$\Rightarrow\left(E_{33}-R_{K}^{2}\psi\right)\left[\left(-\delta E_{23}\right)-0\right]>E_{23}\left(-\delta E_{33}\right)\left[\begin{array}{l}u\sin g\\ R_{12}^{1}+{}^{P}R_{22}^{1}=0\\ E_{21}+{}^{P}E_{22}=-\delta E_{23}\\ E_{31}+{}^{P}E_{32}=-\delta E_{33}\end{array}\right]$$

$$\Rightarrow-E_{33}\delta E_{23}+\delta E_{23}R_{K}^{2}\psi>-E_{33}\delta E_{23}$$

$$\Rightarrow\delta R_{K}^{2}E_{23}\psi>0\left[\begin{array}{l}\sin ce\\ E_{23}=E_{32}\end{array}\right]$$

All the four terms in left hand side are positive. So the condition $\frac{dP}{dS}.\frac{1}{P}>0$ is unambiguously satisfied, i.e. real exchange rate $\frac{1+S}{P}$ is guaranteed to depreciate.

Effect of dθ> 0 in the presence of non tradable good

In the absence of non tradable goods, it was possible for investment and exports to increase without any change in relative prices in the first period. Is it same in the presence of non tradable? We also want to see the effect of a rise in θ on real exchange rate. We differentiate (2), (4) and (5), and use equation (9) i.e. $dW=\frac{\delta R_{\theta}^{2}}{E_{W}}d\theta$

(2) gives

$$\delta R_{K}^{2}(1,K+I,\theta)=\text{q}$$

Differentiating totally,

$$R_K^2 d\delta + \delta R_{KK}^2 dI + 0dP = -\delta R_{K\theta}^2 d\theta \quad \text{.....(A)}$$

(4) gives

$$E_\delta(1+S,P,\delta,W) = R^2(1,K+I,\theta)$$

Differentiating totally,

$$E_{33}d\delta - R_K^2 dI + E_{32}dP + E_{3W}dW = R_\theta^2 d\theta$$

$$\Rightarrow E_{33}d\delta - R_K^2 dI + E_{32}dP = R_\theta^2 \frac{-\delta E_{3W}}{E_W} d\theta \qquad \left[\text{since } dW = \frac{\delta R_\theta^2}{E_W} d\theta\ \right]$$

$$\Rightarrow E_{33}d\delta - R_K^2 dI + E_{32}dP = R_\theta^2 \frac{(E_{1W} + PE_{2W})}{E_W} d\theta \quad \text{.....(B)}$$

$$\left[E_{1W} + PE_{2W} = -\delta E_{3W}\right]$$

(5) gives

$$E_2(1+S,P,\delta,W) = R_2^1(1+S,P,K)$$

Differentiating totally,

$$E_{23}d\delta + 0dI + E_{22}dP + E_{2W}dW = R_{22}^1 dP$$

$$\Rightarrow E_{23}d\delta + 0dI + \left(E_{22} - R_{22}^1\right)dP = -E_{2W}\frac{\delta R_\theta^2}{E_W} d\theta \quad \text{.....(C)}$$

Arranging (A),(B) and (C) in matrix form-

$$\begin{bmatrix} R_K^2 & \delta R_{KK}^2 & 0 \\ E_{33} & -R_K^2 & E_{32} \\ E_{23} & 0 & \left(E_{22} - R_{22}^1\right) \end{bmatrix} \begin{bmatrix} d\delta \\ dI \\ dP \end{bmatrix} = \begin{bmatrix} -\delta R_{K\theta}^2 d\theta \\ R_\theta^2 \dfrac{(E_{1W} + PE_{2W})}{E_W} d\theta \\ -E_{2W}\dfrac{\delta R_\theta^2}{E_W} d\theta \end{bmatrix} \quad \text{.....(18)}$$

The determinant

$$R_K^2\left[-R_K^2\left(E_{22}-R_{22}^1\right)\right]+\delta R_{KK}^2\left(E_{32}\right)^2-\delta R_{KK}^2E_{33}\left(E_{22}-R_{22}^1\right)=\Omega(say)\ldots\ldots\ldots(19)$$

Here the sign of Ω is conditional. Since the middle term is negative, sign of the total expression is dependent on the relative strength of own and cross price effects. If own price effects are stronger than the cross price effect, then the determinant will be positive.

Effect of θ on investment

$$dI=\frac{1}{\Omega}\left[\left\{R_K^2\left(R_\theta^2\left(\frac{E_{1W}+PE_{2W}}{E_W}\right)d\theta\left(E_{22}-R_{22}^1\right)+E_{2W}\frac{\delta R_\theta^2}{E_W}d\theta E_{32}\right)\right\}+\delta R_{K\theta}^2d\theta\left\{E_{33}\left(E_{22}-R_{22}^1\right)-\left(E_{32}\right)^2\right\}\right]$$

$$\Rightarrow\frac{dI}{d\theta}=\frac{1}{\Omega}\left[\left\{R_K^2R_\theta^2\left(\frac{E_{1W}+PE_{2W}}{E_W}\right)\left(E_{22}-R_{22}^1\right)+R_K^2E_{2W}\frac{\delta R_\theta^2}{E_W}d\theta E_{32}\right\}-\delta R_{K\theta}^2\left\{E_{33}\left(-E_{22}+R_{22}^1\right)+\left(E_{32}\right)^2\right\}\right]$$

$$\Rightarrow\frac{dI}{d\theta}=\frac{1}{\Omega}\left[R_K^2R_\theta^2\left(\frac{E_{1W}+PE_{2W}}{E_W}\right)\left(E_{22}-R_{22}^1\right)-\delta R_{K\theta}^2\left\{\left(E_{32}\right)^2-E_{33}E_{22}+E_{33}R_{22}^1+\right\}+E_{2W}E_{23}R_K^2\right]$$

..... (20)

Similar to the case without non tradables, the sign is ambiguous. The income effect of the productivity increase (in the second period) pushes up the desired consumption in both the periods. It drives up the real interest rate to eliminate excess demand in the first period. Investment will increase if increase in r is small.

Effect of θ on real exchange rate

Since S is kept constant in this case, $\frac{1+S}{P}$ moves with inverse of P. It implies that real exchange rate (which is the inverse of $\frac{1+S}{P}$) moves only with P and in the same direction.

$$dP = \frac{1}{\Omega}\left[\left\{R_K^2\left(R_K^2 E_{2W}\frac{\delta R_\theta^2}{E_W}d\theta\right)-0\right\}-\left\{\delta R_{KK}^2\left(E_{33}\left(-E_{2W}\frac{\delta R_\theta^2}{E_W}d\theta\right)\right)-\delta R_{KK}^2\left(E_{23}R_\theta^2\frac{(E_{1W}+E_{2W})}{E_W}d\theta\right)\right\}-\left\{\delta R_{K\theta}^2 d\theta\left(R_K^2 E_{23}\right)\right\}\right]$$

$$\Rightarrow \frac{dP}{d\theta} = \frac{1}{\Omega}\left[\left(R_K^2\right)^2 E_{2W}\frac{\delta R_\theta^2}{E_W}+\delta R_{KK}^2 E_{33}E_{2W}\frac{\delta R_\theta^2}{E_W}+\delta R_{KK}^2 E_{23}R_\theta^2\frac{(E_{1W}+E_{2W})}{E_W}-\delta R_{K\theta}^2\left(R_K^2 E_{23}\right)\right]$$

$$\Rightarrow \frac{dP}{d\theta} = \frac{1}{\Omega}\left[E_{2W}\frac{\delta R_\theta^2}{E_W}\left\{\delta R_{KK}^2 E_{33}+\left(R_K^2\right)^2\right\}+\delta E_{23}\left\{R_{KK}^2 R_\theta^2\frac{(E_{1W}+E_{2W})}{E_W}-R_K^2 R_{K\theta}^2\right\}\right]$$

.....(21)

In sharp contrast to the case of export subsidy, the effect on the real exchange rate is now ambiguous. The first term is positive and it appreciates the real exchange rate. Intuitively, as real income increases, demand for non tradable goods also increases and pushes up its price. The second term is negative (due to R_{KK}^2) and tends to depreciate real exchange rate. Intuitively as interest rate rises, it reduces the demand for the non tradable and prevents its price from increasing.

3.2 Data

In this paper we have taken a sample of East and South East Asian countries like China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand.

The source of all the data are Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006. We have collected data for the period 1950-2004. But for some of the countries data for the earlier years was not available.

3.3 Method

Since we want to study the causality between openness and investment, we have used Granger causality test.

The variables are defined as-

a) Openness is the share of exports and imports in GDP (ogdp)
b) Investment is the share of investment in GDP (igdp).

All the variables are taken in constant prices.

The Granger causality test shows the direction running from one variable to the other. It is based on the concept that time does not run backward. That is, if event A happens before event B, then it is possible that A is causing B, but it is not possible that B is causing A. In our case the test involves estimating the following pair of regressions:

$$OGDP_t = \sum_{i=1}^{n} \alpha_i IGDP_{t-1} + \sum_{j=1}^{n} \beta_j OGDP_{t-1} + u_{1t} \quad \text{.....(1)}$$

$$IGDP_t = \sum_{i=1}^{n} \lambda_i IGDP_{t-1} + \sum_{j=1}^{n} \delta_j OGDP_{t-1} + u_{2t} \quad \text{.....(2)}$$

Where it is assumed that the disturbances u_{1t} and u_{2t} are uncorrelated. There can be four distinct cases:

a) Unidirectional causality from IGDP to OGDP is indicated if the estimated coefficients on the lagged IGDP in (1) are statistically different from zero as a

group (i.e. $\sum \alpha_i \neq 0$) and the set of estimated coefficients on the lagged OGDP in (2) is not statistically significant from zero (i.e. $\sum \delta_i = 0$)

b) Conversely, unidirectional causality from OGDP to IGDP exists if the set of estimated coefficients on the lagged IGDP in (1) is not statistically different from zero as a group (i.e. $\sum \alpha_i = 0$) and the set of estimated coefficients on the lagged OGDP in (2) is statistically significant from zero (i.e. $\sum \delta_i \neq 0$)

c) Bilateral causality is suggested when the sets of IGDP and OGDP coefficients are statistically significantly different from zero in both regressions.

d) Independence is suggested when the sets of IGDP and OGDP coefficients are not statistically significant in both the regressions.

To run Granger causality test we first have to see whether the variables are stationary or not. This is because; the time trend or non stationary characteristics of the data can affect the reliability of the result. Openness and investment for all the 10 countries were non stationary. We made them stationary by taking first difference (as shown in Appendix2).

The number of lagged terms to be taken in the causality tests is an important practical question. To check for the optimal lag, we run the Vector Auto Regression (VAR) test, and from Akaike or Schwarz information criteria, we found the optimal lag to be 2.[1] Then Granger causality test was run by taking 2 lags. All econometric estimations in this paper have been carried out using *Eviews 5*. The summery of the results is given below in the table form (detailed results are given in the Appendix 3).

Table 2 : Results of Granger causality test for East Asia

Country	igdp → ogdp only	ogdp → igdp ony	igdp → ogdp and ogdp → igdp	No causality
China (1952-2004)				√**
Hong Kong (1960-2004)				√**
Indonesia (1960-2004)	√***			

[1] The optimal lag is that one for which the Akaike or Schwarz information is minimum.

Japan (1950-2004)				$\surd^{**}$
South Korea (1953-2004)	$\surd^{**}$			
Malaysia (1955-2004)				$\surd^{**}$
Philippines (1950-2004)				$\surd^{**}$
Singapore (1960-2004)	$\surd^{***}$			
Taiwan (1951-2004)	$\surd^{*}$			
Thailand (1950-2004)	$\surd^{***}$			

$\surd^{***}$ implies significant at 1% level
$\surd^{**}$ implies significant at 5% level
$\surd^{*}$ implies significant at 10% level

In the above chart the "→" marks the direction, i.e. whether the causation is from investment to openness, openness to investment, either ways, or no ways.

Our results on South Korea and Taiwan to some extent match Rodrik's (1995) findings. He used Heston-Summers data set (PWT 5.5) for the period 1950-1992 and found that the variable investment (as a share of GDP) causes openness (the share of export and import in GDP) for both South Korea (significant at 10% level) and Taiwan (significant at 5 % level). Interestingly he also found openness causing investment in Taiwan (significant at 1% level).

We used the same data set, but of recent version (PWT 6.2) and up to current period (1953-2004 for South Korea and 1951-2004 for Taiwan). Our result found that investment Granger caused openness for both South Korea (significant at 5% level) and Taiwan (significant at 10 % level). But we have not found any reverse causality for Taiwan.

Coming to the rest of the countries, results show that, for some of the countries, e.g., Indonesia, Singapore and Thailand, match the pattern of South Korea and Taiwan. But for the other countries like China, Japan, Hong Kong, Malaysia, Philippines we find no causality between investment and openness.

Thus the result implies that, there is not only difference between the growth pattern of East Asian and non East Asian countries as suggested by Rodrik (1995); there is difference among the East Asian countries also. We can not generalise that investment led growth holds for all East Asian countries.

Chapter 4: Export Promotion Policies of Selected East Asian Ccountries

In the previous chapter we found that in some East Asian countries, Indonesia, Singapore and Thailand, there is evidence of investment-led growth similar to South Korea and Taiwan. At the same time in some other countries, China, Japan, Hong Kong, Malaysia and Philippines, we found no causality between openness and investment. But most interestingly, in none of the East Asian countries did the data show causation from openness to investment.

Thus we can divide the East Asian countries into two categories—countries with investment led growth (i.e. Indonesia, Singapore Thailand, South Korea and Taiwan) and countries with no causal link between investment and openness (i.e. China, Japan, Hong Kong, Malaysia and Philippines). Here we will study the export promotion policies by taking two representatives from each category, namely, China, Japan, South Korea and Taiwan. These are the four densely populated resource poor countries, which, despite differences, have an outstanding record of development.

We will study mainly:

1) When and why these countries liberalised
2) What were their export promotion policies
3) How export was promoted through Export Processing Zones (EPZs)

We then try to explain the differences in the results found in the previous chapter.

4.1 When and why these countries liberalised

South Korea and Taiwan

The wide ranging argument about the liberalisation process of both South Korea and Taiwan is quite similar. During the early 1950s, both the countries were preoccupied with conventional import substitution policies. Both were distinguished by multiple exchange rates, high levels of trade protection and repressed financial markets (Rodrik, 1995a). By

the late1950s, both adopted export-oriented policies. A few reasons can be cited for the shift:

1. During the early1950s US aid was the main source of foreign exchange for both these economies. By the late 1950s, reduction in US aid led policymakers to alter their economic strategy.
2. Industrialisation required enormous import of foreign technology and raw materials. To cover the rapidly growing import bill, growing export revenues were needed.
3. Many of the designated priority sectors were characterised by significant economies of scale. The state instructed industry to build their plants sufficiently large so that they could reach efficient production scale. Hence, exports were also necessary to avoid losses from low capacity utilisation in priority industries.

China

From 1949, China followed a closed socialist heavy industry development approach, or the 'Big Push' strategy. Most of it was done at the expense of suppressing the private sector. In the 1950s the country witnessed fast growth in heavy industries. But industrial production was badly affected by the 'Great Proletarian Cultural Revolution' of 1966. The revolution left China in trouble and need for a major economic modification was felt.

It was Deng Xiaoping, who first realised the necessity of opening up. From 1979, China undertook major economic reforms. The aim was to modernise the Chinese economy while maintaining its socialist structure. Liberalisation was inevitable as without market oriented reforms it was not possible then to increase productivity and the quality of technology.

Japan

The post World War II led to an era of traditional import substitution policies in Japan along with heavy import barriers. Almost all products were subject to government quotas and many faced high tariffs. Domestic companies were allowed only limited imports because of the scarcity of foreign currency. The Ministry of International Trade and

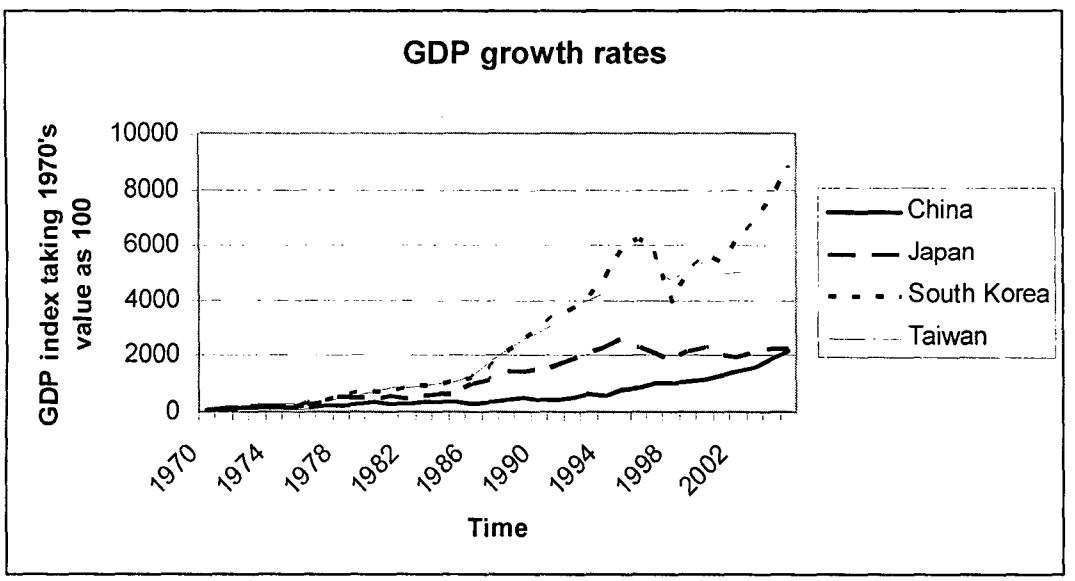
Industry (MITI), the nodal agency for imports, allotted very little foreign exchange to each company for the payment of imports. These policies were justified by the weak industrial position of the country and its chronic trade deficits.

Conditions changed by the late 1950s when Japan's Balance of Payments (BOP) displayed sufficient strength. At that point of time its rigid protectionism was invalid. Therefore, the International Monetary Fund (IMF) and General Agreement on Tariffs and Trade (GATT) strongly pressurised Japan to free its commerce and international payments system. So from the beginning of the 1960s, the government adopted a more open trade policy.

Reconciliation

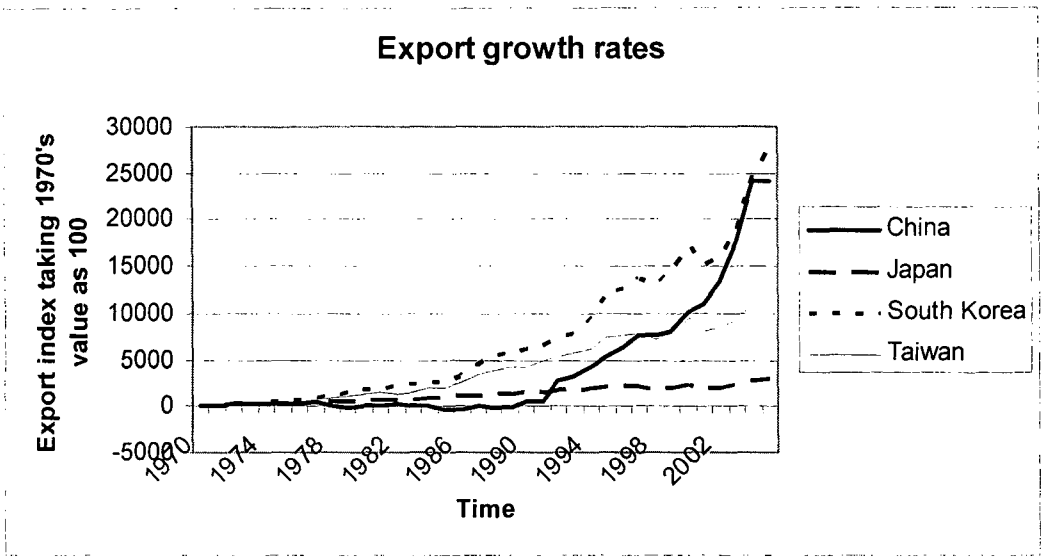
Whatever may be the reasons for opening up; the results were similar in all four countries. Exports led all these economies to specialise according to comparative advantage, resulting in rising productivity, investment, exports and incomes.

Diagram 2: Growth Rates of Gross Domestic Product



Source: Handbook of Statistics, UNCTAD

Diagram 3: Growth Rates of Exports



Source: Handbook of Statistics, UNCTAD

Data on both GDP and export have been taken for the entire period 1970-2005 in US dollar at current prices in millions. To study the growth rates, we have formed an index by taking the value of the year 1970 as 100.

Growth rate diagram shows that South Korean growth rate is the maximum, followed by Taiwan, Japan and China. Growth rate became downward in 1998 due to the East Asian crisis. But the magnitude is not same, South Korean growth rate was mostly affected and Chinese growth rate was least affected.

China's export growth rate has changed drastically after 1990. Among the four countries South Korea has a good steady export growth rate.

Sachs and Warner (1995) concluded that the important factors behind the success story of East Asian countries were the liberal trade regime and the exchange rate policies. Therefore, in the next subsection we will study these export promoting policies.

4.2 Export promotion policies

Export can be promoted by government through different types of direct subsidies[2], other incentives or by manipulating the exchange rate. In this section we will study the various policies for the export sectors adopted over the last four decades in the four countries, and their results.

4.2.1 South Korea

South Korean economy at present is strongly export oriented. But structural pattern of exports had changed since the 1960s. It is shown in the table below.

Table 3: Export-Import Structure of South Korea

	Main export commodities	Main import commodities
1960s	Textiles, garments, mining and fishing products were the main export products.	Food grains, manufactured goods, inputs for textile, leather and light engineering goods were imported.
1970s	Export structure changed from the primary goods to light industrial, leather and chemical products. Textile was still an important export component.	Import of consumer goods declined because of increased South Korean production of these goods in the domestic market. On the other hand, import of inputs for textile, leather and light engineering goods increased.
1980s	Heavy manufacturing, chemicals and other heavy engineering goods were the main exportable goods.	Main import was iron ore for ship building. Iron ore was transformed into steel in Pohang Iron and Steel Company (POSCO).

[2] Subsidy is a form of financial assistance paid to a business or economic sector. It may come in various forms.

1990s	Main export became Semiconductor, automobiles, telecommunications equipment, chemicals, non-electrical and electrical machines, automotive products and other transport equipment.	Main import was iron ore for ship building. Iron ore was transformed into steel in Pohang Iron and Steel Company (POSCO). Semiconductors, liquefied natural gas, petroleum products, computers, and manufacture equipment.
At present	Main export is still Semiconductor, automobiles, telecommunications equipment, chemicals, non-electrical and electrical machines, automotive products and other transport equipment. Apart from these, at present, new export opportunities are also envisaged especially in high technology areas, as South Korea develops its knowledge-based economy in advanced innovation and strategic technologies, such as information technology, bio-technology and nano-technology.	industrial raw materials such as crude and petroleum oil, semiconductors, liquefied natural gas, petroleum products, computers, tankers, manufacture equipment, copper goods, coal, iron & steel and aluminum.

Back during the 1950s the Chang Myon government attached no particular importance to exports. Exports constituted only 1-2% of GNP whereas imports were 14-22% of the same. The deficit was financed by US aid. After a very low growth rate in 1952 because of the Korean War GNP grew rapidly for about four years from 1953 to 1957 with the inflow of massive foreign aid. After 1961, government of General Park Chung Hee got the benefit of Rhee administration's decision to use foreign aid from the US during the

1950s to build nationwide network of primary and secondary schools, modern roads, and a modern communications network. The result was that by 1961, South Korea had a well-educated young work force and a modern infrastructure that provided Park with a solid foundation for economic growth. Park's government took a massive initiative to promote exports through various subsidies and exchange rate manipulation to make South Korea an example of successful export policies.

4.2.1.1 Subsidies and other incentives

Park's government established the Economic Planning Board in 1961 to implement export-led growth planning. Its three main pillars of export promotion strategy were preferential tax system, preferential credit system and administrative support system.

Preferential tax system

From 1961 the board exempted sales tax and reduced the direct taxes paid from the profit made through export. At the same time tariff exemptions were there on imports of raw materials and spare parts by the exporters. From 1965 tariff and tax exemptions were granted to domestic supply of the exporting firms and at the same time wastages allowance subsidies were also given.

Park's government provided an implicit guarantee that it would bail out those entrepreneurs investing in promising sectors, in case of any threat to their profitability arising out of these investments. As well as reduced rates for electricity and transportation services were applicable for the exporters (Rodrik, 1995a).

Preferential credit system

The board extended control over business by nationalising the banks and merging the agricultural cooperative movement with the agricultural bank. Exporters were given short term and long term credit for purchase of inputs and fixed capital investment at preferential interest rates.

Short-term, low-interest loans were extended without limit against any letter of credit at interest rate 6 ½ %, when after the interest rate reform ordinary bank loan rates increased up to 26 % because even at this rate excess demand for loan was positive. The cost of the interest rate subsidy was born by the Central Bank.

From 1964, offshore procurement loans were given to exporters and from 1965 credits for overseas marketing activities were introduced.

Administrative support system

It included special attention of officials to any problems faced by exporters to solve them as soon as possible.

The Korean Trade Promotion Corporation (KOTRA)[3], was founded as a public entity in 1962. KOTRA was the overseas arm of the Ministry of Commerce and Industry and functioned as commercial attaches of embassies normally do. KOTRA assisted manufacturers in locating markets, advised on market requirements and served as a medium for information between Korean producers, traders and foreign buyers. It also used to do market research and promote exports, particularly of small and medium sized enterprises. The entrepreneurs with highest export achievements in different industries were formally rewarded with the national Medal of Honour, Presidential commendations, and various more material benefits, such as relaxation of tax surveillance.

In March 1965, an Export Promotion Subcommittee (EPSC) was formed, which consisted of the vice-ministers of the economic ministries and relevant agencies, governors and officials of the Bank of Korea and the commercial banks and representatives from the Korean Chambers of Commerce, the Korean Businessman's Association, the Korean Traders Association, and the Small and Medium Business Cooperatives Association. At the working level, the EPSC consisted of a series of private and public task forces assigned to examine problems of finance and taxation, agriculture,

[3] This was the name initially, which became Korea Trade-Investment Promotion Agency since 1995.

fishing, mining, heavy industry, light industry, marketing, information, quality improvement and technical assistance etc. (Haggard et al., 1991).

In 1965, the first National Export Promotion Meeting was held, chaired by the president Park. This continued to be the monthly trade promotion meetings attended by main economic agent of the country and big businessman to set production and export targets. These targets of the exporting firms were periodically reviewed. The president could act directly on problems that individual exporters were facing. The meetings provided a way of smoothing difficulties they had in dealing with government ministries.

Although Economic Planning Board remained up to 1996, all the above mentioned export promoting policies were abolished in 1973, when South Korea moved away from the intervention policy towards greater reliance on the market. Park's government pursued a wide range of market liberalisation policies and focused on Heavy and Chemical Industrialisation (HCI). These industrialization was promoted by giving incentives through finance. Strong emphasis was given to large enterprises and chaebols[4]. This adversely affected the light manufacturing industries, small and medium-sized enterprises and led to lopsided development.

In 1973, Park's government established a fund called the National Investment Fund (NIF) through which financial support was given to exporters on a deferred payment basis. Deferred export financing through NIF was administered by the Export-Import Bank of Korea. This bank also used to sell export insurance, purchase of which was compulsory on all loans provided by the bank.

The interest rate charged on directed loans to the large export sectors was less than the interest rates on comparable commercial loans. Steel producers were one of the major beneficiaries of such loans. These loans have been considered as production subsidy - not

[4] Chaebol refers to a South Korean form of business conglomerate. There are several dozens of large Korean family-controlled, governmentgovernment-assisted corporate groups which fall under this definition, and have played a major role in the South Korean economy since the 1960s. Some have become well-known international brand names, such as Samsung, Hyundai and LG.

export subsidy. The US has applied countervailing measures on imports of different steel products from Korea on the ground that Korean steel exports have benefited from government subsidies, both on production and export.

To balance the lopsided development, region-specific subsidies were given to encourage investments in certain ones or to encourage relocation of industry from large cities to places outside metropolitan areas. Preferential treatment given to the units located in Export Processing Zones or Special Economic Zones with respect to charging rents or certain taxes and duties can be also considered as region-specific subsidies.

The Fifth Five-Year Economic and Social Development Plan (1982-86) sought to shift the emphasis away from heavy and chemical industries, to technology-intensive industries, such as precision machinery, electronics (televisions, videocassette recorders, and semiconductor-related products), and information. More attention was to be devoted to building high-technology products in greater demand on the world market (Haggard et al., 1991).

Gradual liberalisation of inward foreign direct investment (FDI) is intended to improve domestic efficiency and meet foreign requests. Since 1993, the government has simplified investment procedures, established a 'one-stop' service system, provided tax exemptions and favourable financing, and created new industrial estates for foreign investors. Inward FDI has been outstripped by outflows in recent years, in part to develop new outlets and escape domestic cost pressure (Trade Policy Review, 1996).

Trade liberalisation and a commitment to WTO principles have been integral to South Korea's economic policies in the 1990s. Based on pre-announced programmes, tariffs have been reduced and quantitative restrictions were abolished across virtually all sectors.

In 1996 the government announced a number of measures to promote exports. These included increase in the ceiling for advance export payments, reduction in import duties on certain raw inputs and expansion of export insurance fund. At present The Ministry of

Foreign Affairs and Trade (MOFAT) has primary responsible for international trade negotiations, formulation and implementation of trade policies.

Apart from joining the WTO, in 1990s South Korea joined Asia-Pacific Economic Cooperation (APEC) and the Organisation for Economic Co-operation and Development (OECD). As a result the country further liberalised trade and modified its trade and industrial policies to make them consistent with these multilaterals. For example, Korea abolished many of its subsidies by 1998. Previously a domestic person or a corporation engaged in foreign exchange earning business was allowed to establish a reserve amounting to the lesser of one percent of foreign exchange earning or 50 per cent of net income for the respective tax year. If certain export losses occurred, these could be offset using money in the reserve fund. Any amount that was not used to offset a loss was to be returned to the income account and taxed over a three-year period, after a one-year grace period. This programme was an export subsidy as it was contingent upon export performance. This system of reserves for export losses was eliminated. Various kinds of tax credits, which were considered as import substitution subsidies, were also removed.

At the same time, Korea has made major tariff reductions by voluntarily implementing the five-year Tariff Reduction Plan from 1989 to 1994. As a result, the average tariff rate was reduced from 18.1 per cent in 1988 to 7.9 per cent in 1994. Korea's tariffs on manufactured products averaged 6.2 per cent on a trade-weighted average in 1995 (Trade Policy Review, 2004).

4.2.1.2 Exchange rate policies

According to Moreno (1989) South Korea faced allegations of unfair trading practices through manipulating the exchange rate in order to get a competitive advantage in international trade. So here we study the movement of the Purchasing Power Parity (PPP) converted real exchange of the South Korean Won against the US dollar and the volume of export and import during the same period. In the following table we show the nominal exchange rate and the volume of exports and imports.

Table 4: Real Exchange Rate and trade Values of South Korea

(Trade values are in US dollars at current prices)

Year	Exchange rate	Volume of Export	Volume of Import		Year	Exchange rate	Volume of Export	Volume of Import
1960	63	32	344		1982	731	21853	24251
1961	125	41	316		1983	776	24446	26192
1962	130	56	422		1984	806	29245	30631
1963	130	87	560		1985	870	30282	31136
1964	214	118	404		1986	881	34715	31585
1965	266	173	463		1987	823	47281	41020
1966	271	251	716		1988	731	60696	51811
1967	271	321	996		1989	671	62377	61465
1968	277	457	1463		1990	708	65016	69844
1969	288	624	1824		1991	733	71870	81524
1970	311	836	1984		1992	781	76631	81775
1971	347	1067	2394		1993	803	82235	83800
1972	393	1625	2522		1994	803	96013	102348
1973	398	3221	4240		1995	771	125058	135119
1974	404	4462	6852		1996	804	129715	150339
1975	484	4945	7274		1997	951	136164	144616
1976	484	7716	8774		1998	1401	132313	93281.8
1977	484	10048	10811		1999	1189	143685	119752
1978	484	12722	14972		2000	1131	172267	160481
1979	484	15057	20339		2001	1291	150439	141098
1980	607	17512	22292		2002	1251	162470	152126
1981	681	21268	26131		2003	1192	193817	178827
					2004	1145	253845	224463

Source: Exchange rate is taken from Penn World Table, export and import values are in US dollars at current prices in millions and taken from UNCTAD

We find that the Won has been devalued quite frequently. Between 1960 and 61 Won was devalued by almost 100 % against the US dollar. Again we find a devaluation to the tune of more than 100 percent between 1962 and 1965. With continuous devaluation the Won reached a rate of 311 Wons against the US dollar in 1970 from just 63 in 1960 and further to 404 in 1974. This was obviously beneficial for South Korean exporters, and exports increased from just 32 million US dollars in 1960 to 4464 million US dollars in 1974.

The Won was kept fixed at 484 for four years, from 1975 to 1979. But interestingly we see exports increasing quite rapidly in this phase and catching up with import value in

1977. This was mainly due to the fact that other policies at that time were helping heavy manufacturing and chemical industries to export.

In 1988, the US Treasury reported to the US Congress that South Korea had manipulated the rate of exchange between their currency and the US dollar for purposes of gaining an unfair competitive advantage in international trade (Moreno, 1989). But the Won was revalued between 1987 and 1989. So in 1988 the complaint was baseless. Since 1999 the nominal exchange rate of the Won against the US dollar is more or less constant. Both exports and imports value had increased with export overtaking import marginally.

Frank et al. (1975) studied South Korean Effective Exchange Rate (EER) for the period 1955 to 1970 and found that the EER for export remained remarkably steady for the country. The same fact is pointed out by Jones and Sakong (1980). But exports were increasing rapidly at that period. So according to them it is a false claim that South Korean exports increased mainly due to exchange rate manipulation.

Rodrik (1995) showed that change in relative prices was smaller for South Korea, compared to the highly increasing export-GDP ratio. By regression analysis he also showed that for a long period (1956-1991) there was no evidence of a statistically significant effect of the exchange rate on exports. Rodrik's (1995) model helped explain the empirical finding that, the special growth process of South Korea was possible even with relatively small change in the relative price of exportables.

In a nutshell, to what extent these measures helped South Korea to achieve high export growth is still a controversial and unsettled issue. At one extreme, the view is that high export growth wouldn't have been possible without government's role in export promotion and in providing a stable macro economic environment (Wade 1990). The other extreme view is that the high export growth in South Korea was the result of policies that encouraged investment in the country (Rodrik 1995). Both these views relate to supply-side factors while another view stresses demand-side conditions. This view is

based on the argument that the momentum for export growth came from external sources, in particular from Japan (Castley 1995).

4.2.2 Taiwan

At present Taiwan is strongly export oriented. But pattern of exports had changed since the 1960s. It is shown in the table below.

Table 5: Export-Import Structure of Taiwan

	Main export commodities	Main import commodities
1960s	Agricultural products mainly sugar was important export apart from textile and clothing.	Chemical fertilizers were imported for primary sectors, where as iron ore, petrochemicals and capital goods were imported for manufacturing sectors.
1970s	Textiles, consumer products, electrical and electronic products, information technology and electrical machinery were the major exports.	Raw materials, iron ore, crude oil, machine tools and intermediate capital goods were the main imports.
1980s	Electronic goods, textiles, machinery and transport equipments were the main exports.	Raw materials, iron ore, crude oil, and intermediate capital goods were the major imports.
1990s	Mechanical appliances and accessories, electronics, electrical appliances, personal computers and peripherals, metal products, transport equipment, furniture and textiles became main exports.	Oil and petroleum, food products, machine and transport equipments became main imports.
At present	In 2004, Taiwan was the world's tenth largest exporter of merchandise goods. Machinery,	In 2004, Taiwan was the world's ninth largest importer of merchandise goods. Machine and transport

	transport equipments, textiles, electronic integrated circuits and technology intensive micro-assemblies accounted for the largest share in the country's exports.	equipment accounted for the largest share of merchandise imports. Agricultural imports constitute a large share of total import.

4.2.2.1 Subsidies and other incentives

Taiwan government had played a major role in bringing about export growth. In the 1950s government's policy was to develop certain key industries such as integrated steel mills, large shipyards and petrochemical plants which would bring about development in the entire economy through backward and forward linkage effects (Pack and Westphal, 1986). In Taiwan it was common for the state to establish new upstream industries and then either hand the factories over to selected private entrepreneurs (as happened in the case of glass, plastics, steel and cement), or run them as public enterprises.

In the early 1950s, instead of giving tax concessions and subsidy facilities to the exporters, Taiwan government took initiatives to develop heavy industries which would help export products in the long run through linkage effects (Rodrik, 1995a).

From the mid 1950s, the government started moving away gradually from its import substitution policy. During this time exporters were able to borrow much or all of their working capital requirements from government at lower than normal bank lending rates. The government made allotment of loans on the basis of export performance. If a firm wanted any help from government its request was treated more favourably if the firm could show a good export record (Wade,1990).

In 1960, Taiwan government instituted three major reforms. The first was a major shift in government attitudes toward investment. the Nineteen-Point Reform Program contained a wide range of tax subsidies for investment, which encouraged domestic investment. . The second was unification of the exchange rate and fixing it at 40.00 New

Taiwan (NT) dollars per US dollar. The third was liberalisation of the tariff rebate system started in 1955 in order to promote exports further (Okuda, 1994). If raw material and intermediate goods were imported for the production of export goods, exporters had to pay little or no tariff duty.

In 1965, export promotion was further extended with bonded factories and Export Processing Zones (EPZs). This extensive export promotion in the 1960s increased the demand for infrastructure. At the same time it was recognised that the export require substantial imported inputs. To meet the heavy import bill export revenues needed to increase substantially.

In the 1970s the government undertook an economic policy of import substitution within strategic state-owned heavy industries, while it continued its export-promotion policies. In order to increase net export revenue the Taiwan government focused on self-sufficiency and substitutions of imported material goods with domestic ones. The establishment of public enterprises in the fields of iron and steel, ship-building and petrochemicals was a secondary import substitution strategy (Okuda, 1994).

The government also presented a modified investment subsidy policy that curtailed support for labour-intensive investment and encouraged export-oriented investment. But the new strategy required greater technical competence and a better educated labour force. Thus a greater share of the government's revenue was invested for productive purposes in education, infrastructure, Research and Development (R&D) and state-owned industry.

Taiwan's External Trade Development Council (TAITRA) was founded in 1970 with the primary objective of providing support to trade promotion. Jointly sponsored by the government and industrial and commercial associations, it assisted businesses and manufacturers to reinforce their global competitiveness and to cope with challenges in markets outside Taiwan. TAITRA is in charge of implementing the Global Export Promotion Programme, aimed at expanding markets overseas such as Japan and

European countries, South-East Asia, Central Asia, and South America. The programme targets traditional industries such as textiles, and potential industries such as electronics, information technology, and electrical machinery. Its major functions include: market research and information service, market development, exhibition and convention service, design promotion, trade education, and web service.

In the bid to speed up exports on the wheel of technology the Industrial Technology Research Institute (ITRI) was established in 1973. Its mission was to build technological capacities across targeted hi-tech sectors. Its focus has been more on technology transfer than on research.

In the 1980s, the Taiwan government accelerated liberalisation through a massive tariff reduction. Government's intention was to develop capital- and technology-intensive industries and capture a huge share of the world's information and electronics market. Import controls and restrictions on foreign investment were also relaxed by this time.

However, the liberalisation during this decade was triggered by US intervention. Taiwan's bilateral trade surplus with the US reached its peak in 1987 when the latter was suffering from growing trade deficits. So it was unwilling to accept Taiwan's protectionism and excluded it from the General System of Preference (GSP)[5] list in 1988. Coupled with this, Taiwan was forced to enter into GATT. This led the government to reduce tariffs and abolish non-tariff barriers. This shifted the country's comparative advantage from labour-intensive to capital and technology-intensive industries. To cope up with this changing comparative advantage government also turned its focus to the latter (Okuda, 1994).

Liberalisation and deregulation continued throughout the 1990s with the government's emphasis on high-tech industries. Recently Taiwan attempted to strengthen the development orientation further. One strategy has been to develop the country into a regional economic centre of transnational operations combined with the strengthening of

[5] The objective of the GSP is to favour the developing countries through special measures.

Taiwan's hi-tech capabilities. Transnational investments and technology co-operation may indeed be crucial to accelerate the transfer of new technology across borders and to enhance domestic R&D capabilities as Taiwan attempts to emerge as a leading power in the world economy.

In 2001 Taiwan was admitted to the WTO, along with China. Since its accession to the WTO, Taiwan has continued to liberalise its trade regime. This liberalisation involved tariffs as well as non-tariff measures, such as prohibitions and licensing. So far the country has not notified any export subsidy to the WTO. At present it does not levy export taxes. But at the same time, exports are subject to a trade promotion service fee and harbour service dues (Trade Policy Review, 2006).

4.2.2.2 Exchange rate policies

Taiwan like South Korea also faced allegations of unfair trading practices (Moreno, 1989). According to Emery (1988) there is evidence of massive intervention to limit currency appreciation in Taiwan. Here we will study the Purchasing Power Parity (PPP) converted real exchange rate movements of the New Taiwan (NT) dollar against the US dollar to judge whether or not these allegations hold true. In the following table we have plotted the nominal exchange rate and the volume of exports and import accordingly.

Table 6: Real Exchange Rate and trade Values of Taiwan

(Trade values are in US dollars at current prices)

Year	Exchange rate	Volume of Export	Volume of Import		Year	Exchange rate	Volume of Export	Volume of Import
1960	36	164	271		1982	39	22075	18826
1961	40	201	322		1983	40	25086	20308
1962	40	220	304		1984	40	30438	22001
1963	40	332	363		1985	40	30696	20123
1964	40	434	429		1986	38	39753	24229
1965	40	449	557		1987	32	53820	34801
1966	40	536	621		1988	29	60502	49763
1967	40	640	808		1989	26	66194	52506
1968	40	802	906		1990	27	67079	54830

1969	40	1049	1216		1991	27	76163	63078
1970	40	1428	1527		1992	25	81387	72181
1971	40	1997	1848		1993	26	84641	77099
1972	40	2913	2518		1994	26	92875	85507
1973	38	4383	3800		1995	26	111563	103698
1974	38	5518	6983		1996	27	115730	101287
1975	38	5302	5959		1997	29	121081	113924
1976	38	8155	7609		1998	33	110518	104946
1977	38	9348	8522		1999	32	121496	110957
1978	37	12681	11051		2000	31	147777	139927
1979	36	16080	14793		2001	34	122506	107276
1980	36	19786	19763		2002	35	130457	112758
1981	37	22501	21153		2003	34	143900	127366
					2004	33	173909	168090

Source: Exchange rate is taken from Penn World Table, export and import values are in US dollars at current prices in millions and taken from UNCTAD

From 1961 up to mid 1980s, the New Taiwan (NT) dollar was officially pegged to the US dollar. In 1987, the US Treasury reported to the US Congress that Taiwan had manipulated the rate of exchange between their currency and the US dollar for purposes of gaining an unfair competitive advantage in international trade.1987 onwards the New Taiwan (NT) dollar was revalued several times to cope up with the US complaint about exchange rate manipulation (Moreno, 1989). The real exchange rate was revalued from 38 in 1986 to just 25 in 1992.

But this revaluation couldn't hamper exports because at the same time capital and technology-intensive industries were promoted and exports increased by exploiting Taiwan's changing comparative advantage from labour-intensive goods to technology-intensive goods.

Though the exchange rate was more or less constant in the entire period from 1960 to 1986 trade value witnessed an increase. So the allegation of exchange rate manipulation does not seem to hold much ground for Taiwan. In his study, Moreno (1989) found that, the allegation of exchange rate movement improving competitiveness may have some arguments for South Korea but certainly not for Taiwan.

Rodrik (1995) showed that export-GDP ratio of Taiwan was increasing rapidly in the 1960s and the 1970s with very little change in relative prices. By regression analysis also he showed that during this period the exchange rate change had an insignificant effect on Taiwan's exports. Rodrik's (1995) model helped explain the empirical finding that growth was possible in Taiwan even with a relatively small change in the relative price of exportables.

The government's role in Taiwan's export promotion and providing a stable macro economic environment was important (Wade 1990). At the same time a profitable environment to invite investment was also important (Rodrik 1995). Thus, to what extent these measures helped Taiwan to achieve high export growth is still a controversial and unsettled issue.

4.2.3 China

Export pattern had changed for China since the 1960s. It is shown in the table below.

Table 7: Export-Import Structure of China

	Main export commodities	Main import commodities
1960s	Textile and clothing, agricultural raw material, chemicals, mineral and metal ores were the major exports.	Food stuffs and intermediate goods were main imports.
1970s	Textile and clothing, crude petroleum, agricultural raw materials and chemicals were the main exports.	Food stuffs, intermediate goods, machinery and transport equipment and technology were the major imports.
1980s	Manufacturing goods, mainly textile and clothing, chemicals, mineral and metal ores, crude and refined petroleum and agricultural raw materials were major exports.	Intermediate goods, of which iron and steel, chemicals, crude materials were important. Apart from these capital goods and transport equipments were also imported. Share of food staffs

		declined.
1990s	Manufactures accounted for the largest share (nearly 80%) of China's total merchandise exports in 1990s. Among manufactures, textile and clothing, chemicals, electrical machinery and mineral and metal ores were important. Share of crude and refined petroleum and agricultural raw materials reduced.	Capital goods and transport equipment became major imports. The share being declined, intermediate goods are still major imports.
At present	Manufactures accounted for the largest share of China's total merchandise exports in 2004. Exports of high technology products like different types of machinery, telecommunications and transportation equipment has increased very rapidly. Compared to this, exports of relatively low technology products like textiles increased slowly.	In 2005, 41.5% of imports entered China under the 'processing trade regime. Capital goods are also major imports. In 2004, China was the largest developing country recipient of FDI, and the third largest recipient of FDI in the world, after the United States and the United Kingdom.

4.2.3.1 Subsidies and other incentives

In the 1960s China traditionally viewed export as just a surplus over domestic production, sold in order to generate foreign exchange for the import of commodities like grain (due to short supply at home) and imported technology. External trade was conducted through only to a limited number of Foreign Trade Corporations (FTCs) under a rigid state planning system up to 1978.

China has made major changes in its export policies and measures since its reform process began in the late 1970s. Before that, the economy was dominated by state-owned enterprises (SOEs), which accounted for virtually the entire GDP and employment (World Bank Document, 1993).

The Open Door policy of 1979 consisted of two major types of policy change: the opening up of geographic regions to foreign investment, and the opening of specific institutions nationwide.

The geographic opening began in 1979, when China granted the provinces of Guangdong and Fujian to preferential policy flexibility. In 1980, the Shengzhen, Zhuhai, Shantou and Xiamen Special Economic Zones (SEZs) were created. In 1982, the Yangtze River Delta, Zhu River Delta and three other regions in Fujian, Liaonin, and Shandong were opened. By 1984, 14 additional coastal cities were opened.

In 1979, the joint venture law was issued to encourage the inflow of FDI in SEZs and other coastal cities, to reduce the reliance on bank loans. China's Open Door policy provides a means for the importation of technologies to which China would not otherwise have access (SEZs will be studied in detail later on).

At the same time China implemented a progressive decentralisation of its foreign trade planning, by handling all trade to a dozen of Foreign Trade Corporations (FTCs) and their branches in 1979. They were responsible to execute all the foreign trade planning.

In 1984 Ministry of Foreign Economic Relations and Trade (MOFERT)[6] allowed FTCs to become independent financial and operating bodies, and also allowed each province to create its own FTCs. By 1986 there were 1200 FTCs in operation (World Bank Document, 1993).

[6] Later known as Ministry of Foreign Trade and Economic Cooperation (MOFTEC)

The foreign trade plan also became more export driven. Exports target would be fixed, and planning was made to manage imports within the foreign exchange constraints implied by that target. The export plan was split into two components, the command plan and the guidance plan. The command plan was mandatory, fixed in quantitative rterms, applied to specific products, and was accompanied by an assured supply of necessary inputs to the producing enterprises. In contrast, the guidance plan contained value targets assigned to provincial authorities, which were accorded considerable flexibility in determining how to achieve them. Products subject to the command export plan were in turn split into two lists, category I exports, comprising products that could be handled only by a few designated national FTCs, and Category II exports that could be handled by all FTCs. From 1986 direct subsidies were given to FTCs –If in loss –to cover their losses.

Chinese authorities have launced two major reforms of their foreign trade in 1988 and 1991.

The key feature of the 1988 reform of the foreign trade system was the contract system. Every provincial level administrative unit and all specialised national FTCs signed contracts with MOFERT. These specified three targets, first, about the amount of foreign exchange earnings, second, about the amount of foreign exchange to be remitted to the central government and third, a fixed amount of domestic currency that the centre would provide to subsidise losses on export sales. MOFERT, the Ministry of Finance, and the State Planning Commission jointly determined the values of each of these targets and the State Council approved these numbers before they were incorporated in the signed contracts. The amount of export subsidies was fixed at an amount equal to 4 % of the value of exports (World Bank Document, 1993).

Another important feature of the 1988 reform was a reduction in the importance of foreign trade plan. The number of export products in Category I – which were subject to mandatory planning – was reduced.

Since the late 1980s China implemented several cuts in its import tariff to attain full membership status in the GATT. China reduced tariffs on 265 import commodities. But despite these reductions, China's average tariff rate was higher compared to the others in 1992 (Lu, 1995).

In 1991 reform , the foreign trade contracting system was modified. The targets for the value of exports, foreign exchange earnings and the foreign exchange remitted to the central monetary authorities are now set annually, rather than every three years. Targets are proposed and negotiated by the enterprises based on their growth trends from previous years.

From 1991, subsidies to cover the losses have been eliminated. FTCs are responsible for their own domestic currency and losses on exports. All mandatory export planning has also been abolished in the reform.

In recent years the government carried out different export promotion schemes:
Export-Import (EXIM) bank of China (established in 1994) is a policy bank under the State Council. It is in charge of providing export credit. Its functions cover financial support to promote export of mechanical and electrical products and capital goods. EXIM bank also supports export of ships and other vessels. In 2003, more than 90 % of export of ships and other vessels were aided by the bank. This investment is necessary to make China the world's third largest exporter of ships and vessels since 2001 (Trade Policy Review 2006).

The China Export & Credit Insurance Corporation (SINOSURE) was set up in 2001 to promote exports, particularly in the high value-added and hi-tech capital goods sector. It is the only official export and credit insurance company and is not profit driven. SINOSURE also provides investment insurance and export-related guarantees.

There are some other forms of export assistance also in China. The Ministry of Commerce (MOFCOM) publishes information online to help enterprises export. Much of

the information is designed to help small and medium-sized enterprises (SMEs). The International Market Exploration Fund helps SMEs to participate in overseas exhibitions, promotion in international markets and exploration in new markets.

The China Council for Promotion of International Trade (CCPIT) promotes export by establishing contacts with foreign governments, organising seminars, export fairs in China and abroad, collecting and publishing trade related information, offering consultation service to enterprises and helping them to apply for patents and register trade markets.

China became a Member of the WTO in 2001. For its commitments in the WTO China reduced tariffs and eliminated most non-tariff measures, and opened the services sector to foreign competition.

4.2.3.2 Exchange rate policies

If a US trading partner makes large-scale purchase of dollar for a long time, which leads to a lower-than-market based exchange rate, then it is called exchange rate manipulation, according to IMF. As per this definition, China has manipulated the exchange rate according to Preeg (2003).

Here we will study the movements of Purchasing Power Parity (PPP) converted real exchange rate of Renminbi[7] against US dollar. In the following table we have plotted the real exchange rate and the values of exports and imports accordingly.

[7] The Renminbi is the currency of the mainland of the People's Republic of China (PRC) whose principal unit is the Yuan .

Table 8: Real Exchange Rate and trade Values of China

(Trade values are in US dollars at current prices)

Year	Exchange rate	Volume of Export	Volume of Import		Year	Exchange rate	Volume of Export	Volume of Import
1960	2.46	2571	2648		1982	1.89	22321	19285
1961	2.46	1941	1746		1983	1.98	22226	21390
1962	2.46	1913	1372		1984	2.32	26139	27410
1963	2.46	2031	1450		1985	2.94	27350	42252
1964	2.46	2250	1710		1986	3.45	30942	42904
1965	2.46	2563	2246		1987	3.72	39437	43216
1966	2.46	2680	2481		1988	3.72	47516	55268
1967	2.46	2388	2169		1989	3.72	52538	59140
1968	2.46	2339	2067		1990	4.78	62091	53345
1969	2.46	2429	1917		1991	5.32	71910	63791
1970	2.46	2307	2278		1992	5.51	84940	80585
1971	2.25	2782	2128		1993	5.76	91744	103959
1972	1.99	3692	2850		1994	8.62	121006	115614
1973	1.96	5876	5207		1995	8.35	148780	132084
1974	1.86	7107	7791		1996	8.31	151048	138833
1975	1.94	7689	7925		1997	8.29	182792	142370
1976	1.86	6943	6660		1998	8.28	183712	140237
1977	1.68	7519	7148		1999	8.28	194931	165699
1978	1.55	9954	11130		2000	8.28	249203	225094
1979	1.50	13614	15620		2001	8.28	266098	243553
1980	1.70	18099	19941		2002	8.28	325591	295171
1981	2.46	22007	22015		2003	8.28	438228	412760
					2004	8.28	593326	561229

Source: Exchange rate is taken from Penn World Table, export and import values are in US dollars at current prices in millions and taken from UNCTAD

Data shows that China's exchange rate was fixed at 2.46 for a long time from 1960 to 1970. Even it remained fixed at 8.28 for the entire period from 1995 to 2004. But surprisingly, both export and import increased in leaps and bounds during that time. The reason, however, is not far to seek.

Before the economic reform of late 1970s there was strict control over foreign exchange in China. Since 1979, there have been significant changes in its foreign exchange rate regime which is marked by major reforms. During this time the Renminbi has undergone transformation from a single official rate to a dual-track system.

From 1981 to 1984, China had dual exchange rates: official (shown in the above table) and secondary. The official rate depreciated gradually while the secondary rate was fixed at a more depreciated rate. The secondary rate, termed as internal settlement rate, was used for settlement of payments between Foreign Trade Corporations and the domestic supplying enterprises. The difference between the official and secondary rates was financed by the government as a subsidy. In 1985 the official exchange rate was set at the internal settlement rate and the latter was abolished (World Bank document, 1993).

However, dual exchange rates reappeared with the establishment of foreign exchange adjustment or 'swap' centres (FEACs) in late 1986. Between 1986 and 1989, the official exchange rate was pegged at 3.72 Yuan per US dollar. This led to a real appreciation of Renminbi in the wake of a rising inflation. By this time the swap rate depreciated, allowing exporting enterprises to maintain their profitability as foreign exchange earnings were priced at the swap rate (World Bank document, 1993).

In 1991, a new floating system was adopted, under which the administered official rate was not fixed – it was re-adjusted frequently through small periodic changes based upon several factors including development in the Balance of payment, foreign currency markets and FEACs. Although the rate was allowed to be adjusted in both directions (↑↓), it tended to depreciate and by 1993 it reached 5.76 Yuan per US dollar (World Bank document, 1993).

But later on, to prevent the East Asian crisis from enhancing further, the Chinese government made a commitment not to devalue the Renminbi. So it was kept as 8.28 Yuan per US dollar until July 2005 (Trade Policy Review, 2006).

4.2.4 Japan

Pattern of exports had changed since the 1960s for Japan. It is shown in the table below.

Table 9: Export-Import Structure of Japan

	Main export commodities	Main import commodities
1960s	Ships, textiles, light manufactures, and crude items, heavy industrial goods, complex machinery and equipment, and consumer durables were the major exports.	Raw materials, coal, petroleum, Metal ores and scrap, chemicals, machinery and equipments were the main imports.
1970s	Iron and steel products, ships, watches, television receivers, automobiles and semiconductors were the main exports.	Raw materials, coal, petroleum, iron, copper and nickel, chemicals, machinery and equipment were the major imports.
1980s	Motor vehicles, semiconductors and electronic components were the important export products.	Mineral fuels, foodstuffs, raw materials, chemicals, machinery and equipment were the main imports.
1990s	Motor vehicles, office machinery, scientific and optical equipment, and semiconductors and other electronic components were the major exports.	Foodstuffs, manufactures, raw materials and oil were important imports.
At present	Japan's main export goods are cars, electronic devices, computers, machinery and transport equipments. In 2005, Japan was the world's fourth largest exporter (counting the European Communities as one) when manufactures accounted for 91.8% of Japan's total exports.	The most important import goods are raw materials such as oil, foodstuffs, and wood. The share of primary imports continued to increase slightly as accounted in 2005 while that of manufactured imports continued to decline.

4.2.4.1 Subsidies and other incentives

During the first two decades after the World War II, Japanese government recognised the importance of imports to grow and develop. To pay for the imports it was necessary to generate exports. So export subsidy was offered in the form of a combination of tax relief and government assistance to build export industries.

Government wanted Japan to grow as a 'processing nation', which will import raw materials, add value to them and again export the value added output. To grow in this manner Japan needed to develop world class industries that could compete in the world market with value added raw materials. At the same time, providing subsidies was essential to the exporting firms so that the massive import bill could be paid through export earnings.

In 1951, the Japan Export-Import Bank was established to provide credit subsidy in the form of medium and long-term loans to ship-builders and exporters. This loan was provided mainly to import raw materials and intermediate goods.

Japan also adopted export-income tax exemption scheme in 1953. This gave export incentive in the form of tax subsidy to producers. Under this scheme a product exported guaranteed more after-tax income than the ones sold in the domestic market.

Japan's subsequent export acceleration started with the establishment of the Ministry of International Trade and Industry (MITI) in 1955. It provided financial help to modernise the heavy manufacturing and chemical industries. Along with various forms of export promotion, quotas were also used to provide protection from import competition (Kuznets, 1988).

In 1958, the Japan External Trade Organisation (JETRO) and the Foreign Trade Council had organised a national trade promotion conference with the support of seven government departments. There was agreement on the objectives like, providing more

education on trade matters, increasing productivity in the export industries in order to improve their international competitiveness, improving the quality and design of export products, getting more and better cooperation between government and private bodies for the promotion of trade. Export promotion schemes by JETRO mainly include the provision of information, market and company studies, and support for participation at international trade fairs. In November 1959, a trade promotion office was set up. This helped to generate a consensus on 'economic growth based on exports' and also put pressure on the government to take an important role in this strategy.

Relations with GATT led to abolition of export-income tax exemption scheme in 1964. After 1964 Japan took a few more measures to promote exports. The Government offered premium redemption on overseas transactions and established a reserve fund to develop overseas markets. A similar reserve fund was formed to develop overseas markets for medium and small trading companies. This enabled smaller companies to operate joint funds. Special measures for export-related expenses were also taken, for example, buyer's expenses on travel, boarding and lodging, etc.

Once the chronic trade deficit came to an end in the mid-1960s, export promotion policies were reduced. Export growth from 1961 to 1971 has been attributed to four factors: growth of world income and trade, increased Japanese price competitiveness, structural changes that expanded manufacturing output capacity, and liberalisation of foreign commercial policy (Kuznets, 1988). Preferential treatment was given to cooperative finance schemes for the export of agricultural and marine products. Export insurance underwent some revisions at this stage with premium rates reduced by 50 % (Trade Policy Review, 1995, 1998).

Japan has been a participant in the rounds of tariff-cutting negotiation under GATT and had a very low average tariff level among other industrial countries. Import expansion policies were established since 1992. Import promotion activities by JETRO were also extended. It opened a business support centre, which provided free office space and supported foreign business people to come to Japan and promote exports. At the same

time it opened the integrated import promotion centre and local import promotion centre to promote imported goods through display and sales in major cities other than Tokyo.

In 2001, Nippon Export and Investment Insurance was established as an independent administrative institute to provide export credit insurance, which previously had been provided by the MITI.

JETRO has also undertaken several export promotion activities for small and medium-sized enterprises since 2004, including support for participation in overseas exhibitions and trade fairs, market research, and advisory services.

4.2.4.2 Exchange rate policies

As per IMF definition, Japan has manipulated the exchange rate according to Preeg (2003). According to Congressional Research Service paper (2007) Japan's currency is 15% undervalued in 2007. Put the paper could not estimate how much of the undervaluation resulted from market forces and how much from intervention.

Here we will study the movements of Purchasing Power Parity (PPP) converted real exchange rate of Yen against US dollar. In the following table we have plotted the real exchange rate and the values of exports and imports accordingly.

Table 10: Real Exchange Rate and trade Values of Japan

(Trade values are in US dollars at current prices)

Year	Exchange rate	Volume of Export	Volume of Import		Year	Exchange rate	Volume of Export	Volume of Import
1960	360	4054	4491		1982	249	138385	131499
1961	360	4235	5810		1983	238	146965	126437
1962	360	4916.	5636		1984	238	169700	136176
1963	360	5452	6735		1985	239	177164	130488
1964	360	6673	7937		1986	169	210757	127553
1965	360	8451	8169		1987	145	231286	151033
1966	360	9776	9522		1988	128	264856	187378

1967	360	10441	11662		1989	138	273932	209715
1968	360	12971	12987		1990	145	287581	235368
1969	360	15990	15023		1991	135	314786	236999
1970	360	19317	18881		1992	127	339885	233246
1971	349	23995	19712		1993	111	362244	241624
1972	303	29088	23862		1994	102	397005	275235
1973	272	37016	38388		1995	94	443116	335882
1974	292	55468	61948		1996	109	410901	349152
1975	297	55819	57860		1997	121	420957	338754
1976	297	67303	64894		1998	131	387927	280484
1977	269	81083	71339		1999	114	419367	311262
1978	210	98211	79922		2000	108	479249	379511
1979	219	102299	109831		2001	122	403496	349089
1980	227	130441	141296		2002	125	416726	337194
1981	221	151495	142866		2003	116	471817	382930
					2004	108	565675	454542

Source: Exchange rate is taken from Penn World Table, export and import values are in US dollars at current prices in millions and taken from UNCTAD

The table shows that Japan maintained a fixed rate regime of 360 Yen against one US dollar for a long time. Although our series starts from 1960, but in reality this fixed rate regime was for 22 years from 1949 to 1971. During this period Japanese economy witnessed rapid growth. From 1971, Yen started to appreciate under the pressure from the US. From 1973, Japan changed to a floating rate system.

After 1985, the Yen began to soar up. Many enterprises in traditional industries invested abroad to lower costs and grab offshore markets. This indirectly led to hollow domestic industries, and thus reduced domestic employment. The lack of employment resulted in reduced income and purchasing power. So the entrepreneurs lost initiative to make domestic investment. These factors are actually the major causes for the long-term deflation of the Japanese economy. It was then that the Japanese government came to realise the harm of premature over-appreciation. From 1997 onwards, Japan adopted strategies to prevent Yen appreciation. The real exchange rate of the Yen against the US dollar had continued to appreciate in the period between 2002 and the end of 2004 (Trade Policy Review, 2007).

4.3 Export promotion through Export Processing Zones (EPZs)

The idea of the EPZ approach is to zone out an area of the country and exempt it from certain local policies so that a micro-investment climate (compatible with the growth of viable export industries) may develop. At the same time the enterprises in the zone may fully exploit the comparative advantage of the country. Therefore, EPZ is in essence a policy enclave where the industrial promotion policy differs from that applied to the country at large. We will now take a close look at the EPZ policies of the four sample countries.

4.3.1 South Korea

In the 1960s the Korean government had chosen not to encourage inward foreign direct investment (FDI). So during the 1960s FDI was only 3% of total investment. The first EPZ was established in Masan in 1970. This was followed by Iri in 1973. These new EPZs were specially designed to suit foreign firms in selected industries, such as electronics, textiles and clothing (Trade Policy Review 2004).

The South Korean government offered a wide variety of incentives to attract firms in its EPZs. These included total exemption from tariff duties on imported capital goods, raw materials, parts and semi-finished goods. Tax exemptions were also there on the export of manufactured products within the zone. In addition, the firms received total exemption from income, corporate, property and acquisition taxes and on profit, dividend, and earned surpluses accruing from foreign owned principal for 5 years. For the next 3 years all these exemptions were halved. At the same time South Korean government also offered the foreign companies permanent exemptions from business tax and from income tax on salary and wages of foreigners working in the zones. The application of various laws and regulations on capital investment, foreign trade and employment of local workers was also waived for EPZ industries. All these incentives were able to attract a notable number of foreign multinational corporations.

The products of Masan EPZ were more concentrated in the medium export intensity industries like electronics goods. But later on, the second EPZ, Iri, developed along a very different line. It utilised local capital and produced more labour intensive types of manufacturing (Sit, 1988).

4.3.2 Taiwan

The first EPZ in Taiwan was established in 1966. EPZs were developed to attract inward FDI and promote exports. Businesses which were allowed to be established in the EPZ included mainly machinery and equipment for medical, electronics, chemicals and biochemicals. Manufacturing of textiles, motor vehicles, food processing, etc., were also allowed. The services sector was also welcome in the EPZ. Consulting, shipping, insurance, legal and accounting services could take place in the EPZ.

In the later 1980s, the significance of the EPZs declined for Taiwan. Except for few lower corporate tax and advantage of 'one-stop' administration, the EPZs got no edge over the other industries. Within just 10 years after establishment, the three EPZs have become more or less stagnant. Exported products were highly labour-intensive, reflecting Taiwan's former comparative advantages in cheap labour (Sit, 1988).

With the advent of the 21st century, national boundaries are gradually disappearing from the global economic map. The Taiwan government realised that it needed to formulate new competition strategies that could drive new operating advantages. So the government decided to promote the establishment of Free Trade Zones (FTZs)[8]. The five approved FTZs till date are Keelung, Kaohsiung, Taipei, and Taichung free-trade harbours and Taoyuan free-trade airport zone (Trade Policy Review, 2006).

The main objective of the FTZs was to integrate the flow of information, funds and goods needed for global logistics, so that companies would be able to complete all of the

[8] A FTZ is an area situated within the controlled district of an airport or seaport, or within an industrial park, EPZ, science-based industrial parks, or other areas as approved for the purpose of conducting domestic and foreign business activities.

transnational economic processes involved in product supply, ordering, shipping, and sales in Taiwan, quickly and efficiently. Extracting the advantages of FTZs, Taiwan has developed into an international procurement and logistics base.

The geographic position has favoured Taiwan to establish FTZs. Whether for sea or air transportation, Taiwan lies at the centre of Eurasian navigation routes and at the finest location for shipping in Northeast Asia. So at present Taiwan mainly gathers the goods from other countries, and re-exports with the final assembly and processing. Taiwan's brand value also increases the price of the goods. Thus the development of FTZs is not merely to promote exports, but for promoting re-exports as well.

The rules and regulations are different in case of EPZs and FTZs in Taiwan. For a quick comparison, they are given below in a tabular form.

Table 11: A Comparison between EPZs and FTZs in Taiwan

Areas of Difference	**Export Processing Zones**	**Free Trade Zones**
Position	Interior special-purpose zones	Locations in international harbour/airport control areas
Shipping Costs	As goods have to be shipped through bonded trucks to the harbours or airports, the company's logistics costs are increased	Being located within international harbors/airports, FTZs do not require bonded trucks. So the costs are saved
Import Certification	Required	Not required
Escorted Shipping	Required	Not required
Bonding Procedure	Required	Not required
Single Window	Implemented	1. Implemented 2. Additional tasks (1) Relaying of entry applications for foreign business people (2) Relaying of stay extensions for foreign business people (3) Promotion of ICT in goods tracking system

Tax Preferences	Exempt from import taxes, commodity taxes, business taxes, contract taxes, trade promotion service fees	Exempt from import taxes, commodity taxes, business taxes, tobacco and wine taxes, tobacco product health welfare donations, trade promotion service fees, harbour service fees
Alien Worker Ratio	30% of total work force	40% of total work force
Offshore Financial Holding Companies	None	Foreigners may establish financial holding companies for offshore investment
International Finance	None	Banks may apply to establish branches to carry out international financial transactions and engage in foreign-currency remittances and transactions
Entry and Exit Permits for Foreign Business People	None	Administrative agency may relay applications for landing visas
Import and Export Goods	Must pass customs	Free entry and exit without passing customs
Intra-zone Transactions	Monthly reporting (with later auditing)	Free flow
Shipment of Goods to Customs Areas	Must pass customs (with monthly reporting and later auditing)	Must declare customs (with facilitated monthly reporting, prior estimation, and later auditing)
Gate Controls	Manual collection of passes	High-tech controls
Goods Tracking System	Sealing or escorted shipment	High-tech facilities (electronic sealing)
Auditing of Books	Monthly record	Remote auditing
Source: Compiled by the Center for Economic Deregulation and Innovation, CEPD		

4.3.3 China

As part of its gradual liberalization in 1979, one of the first major steps taken by China was to set up the SEZs. The State Council of China established SEZ in Southern coastal provinces of Guang dong and Fujian. Shortly after, four SEZs were opened in Shenzen, Zhuhai, Shanton of Guangdong Province and Xiamen of Fujian Province.

The main ideas behind the experiments conducted in SEZs are, attracting and utilising foreign capital, acquiring advanced foreign technology and promoting export in accordance with the comparative advantages of the region. Geographical advantages, able leadership and preferential treatments facilitated the success of China's SEZs.

Geographical advantages

The first SEZs in Guangdong and Fujian were approved due to the geographical and economic preferences of these provinces. First, the four designated SEZs enjoyed geographic vicinity to neighboring advanced economies. Shenzhen is next to Hong Kong, Zhuhai is connected to Macao by land, and Xiamen is close to Taiwan, and Shantou is situated between Hong Kong and Taiwan. All of them are coastal cities and have access to sea-ports. So they were in advantageous positions to spread out trade with developed economies. These cities could offer both inexpensive land and labor for investors from Hong Kong, Macao, Taiwan, as well as Singapore, Malaysia, and Thailand.

Able leadership

Both provinces have a long tradition of trade and entrepreneurship. Many overseas Chinese came from Guangdong and Fujian, who were successful entrepreneurs having sentimental bonds with their Chinese home towns. The provinces could use these overseas Chinese's social connections to attract overseas investment.

Preferential treatment

SEZs enjoyed a number of special policies. First, joint ventures and foreign-owned enterprises were allowed in the SEZs, but needed special approval outside them. Second, prices and distribution of goods were regulated by the market within the SEZs, but by central plans outside the zones. Third, SEZs had jurisdiction in approving much larger investment projects than non-zone localities. Fourth, SEZs enjoyed preferential treatment in tax and tariff reductions and exemptions. Finally, SEZs were granted preferential fiscal arrangements. For example, according to national and provincial provisions, Shenzhen did not have to remit revenue to the national and provincial governments (until 1989) nor

would the province and Beijing provide subsidies. Fiscal autonomy generated fiscal incentives. These privileges enabled investors to enjoy the lowest corporate income tax rates and tariffs on imports and exports, as well as a freer play of markets in SEZs. Thus SEZs became the leading place in China for attracting FDI (Lai, 2006).

The SEZs have been expanded gradually into other kinds of zones, including those specialized in high technologies, free-trade zones and bonded areas to encourage processing and transhipment, and border economic cooperative areas to develop certain parts of the country. Economic and Technological Development Zones (ETDZs) were initially set up in 1984. By the end of 1998, 14 EDTZs had been approved by the State Council. There are currently 49 ETDZs, 27 in the eastern coastal region, and 22 in the mid-west region of China. They are established mainly in the coastal cities and are aimed at developing the high-tech industry to build up an export oriented economy (Trade Policy Review, 2006).

China's Open Policy and SEZs have brought forth miraculous economic growth. It has turned the province hosting the most SEZs into the largest and strongest economy in the nation. Guangdong's GDP ranked sixth nationwide in 1980, the year when the SEZ was built. Its ranking, however, has soared since: With the deepening of its reform, it reached fourth in 1985, second in 1990, and first in 1995. In 1995, the province accounted for 6.1 percent of local revenue income, 9.4 percent of GDP, 33.3 percent of the imports and exports, and 25 percent of the utilized foreign capital of the nation (Lai, 2006).

China adopted export processing as a new form of export promotion through Foreign Investment Enterprise (FIE). FIEs have operated under an entirely different set of institutions and regulations from those applying to most domestic enterprises. The most important is duty-free processing of imported materials and components into exports. Under this, the inputs and components needed for export goods are imported duty free, with minimum administration interference, and re-exported after processing. Thus exports created by FIEs are predominantly products assembled from parts and

components. In 1994, the total processed exports formed almost half of China's export (Trade policy Review, 2006).

4.3.4 Japan

Though no evidence of EPZ is found in Japan, the country is a good source of capital in EPZs of both South Korea and Taiwan. After 1985, the Yen appreciated enormously. This led many Japanese entrepreneurs invest abroad to lower the costs.

4.4 Why the scenario is different in South Korea and Taiwan compared to China, Japan

Now, at the end of this chapter we will try to find probable reasons for evidence of investment-led growth in South Korea and Taiwan, and no causation between openness and investment in China and Japan.

Government policies in South Korea and Taiwan were helpful for the investment boom

The export boom in South Korea and Taiwan started in the mid 1960s whereas the incentives were there from nearly a decade ago (Rodrik, 1995a). The probable sequence for South Korea and Taiwan is government intervention; subsidy and tax incentives increased the profitability of investment in these two countries. At the same time, large and efficient well-educated labour force and a low endowment of physical capital ensured high return of investment. High profits of entrepreneurs and increased earnings for industrial labour force led to a very rapid rise in savings (Little, 1994). So the investment demand was met properly. As a result, there was an investment boom. The investment required imported capital goods. Exports increased because it was needed to pay the huge import bills. At the same time, investment led to the full utilisation of capacity which further resulted in a boom in output. Therefore export performance was mainly a function of domestic supply conditions, not external demand (Kuznets, 1988).

In addition to providing subsidies and tax concessions, both the governments played a much more direct role by organising private entrepreneurs into investments that they may not otherwise have made. Public enterprises played a very important role in enhancing the profitability of private investment in both countries.

The Taiwan government had played the role of a mediating agent and a facilitator in bringing industrial and exports growth. At the initial stage, the government's philosophy was to develop certain key industries (such as integrated steel mill, large shipyard and petrochemical plants) which would bring about development in the entire economy through backward and forward linkage effect (Pack and Westphal, 1986). In Taiwan it was common for the state to establish new upstream industries and then either hand the factories over to selected private entrepreneurs (as happened in the case of glass, plastics, steel and cement) or run them as public enterprises. In Korea also, the government established many new public enterprises in the 1960s and 1970s, particularly in basic industries characterised by a high degree of linkages and scale economies.

The increase in public savings rate increased the total savings in both the countries (Hong, 1976; Kuo, 1983). In addition to eliminating obstacles to investment, government policy in South Korea and Taiwan highly subsidised investment and channelised that into profitable export sectors. Both the governments have used carrot and stick policy. Firms were rewarded in the form of subsidised credit when they fulfilled government objectives and export targets. At the same time, they were also penalised when they performed poorly (Amsden 1989; Wade 1990).

Thus, in a nutshell, we can say that in case of South Korea and Taiwan, government intervention created profitability in investment which needed imported capital goods. On the other hand, exports were needed to pay for the imported capital goods. But the scenario was not so in either Japan or China. In China, despite substantial increase in export, investment allocation remained unaffected. Investable resources were divided more or less equally among all sectors instead of being channeled to the most efficient

ones (World Bank Document, 1993). So there was no special environment created by the Chinese government that could create profitability in investment.

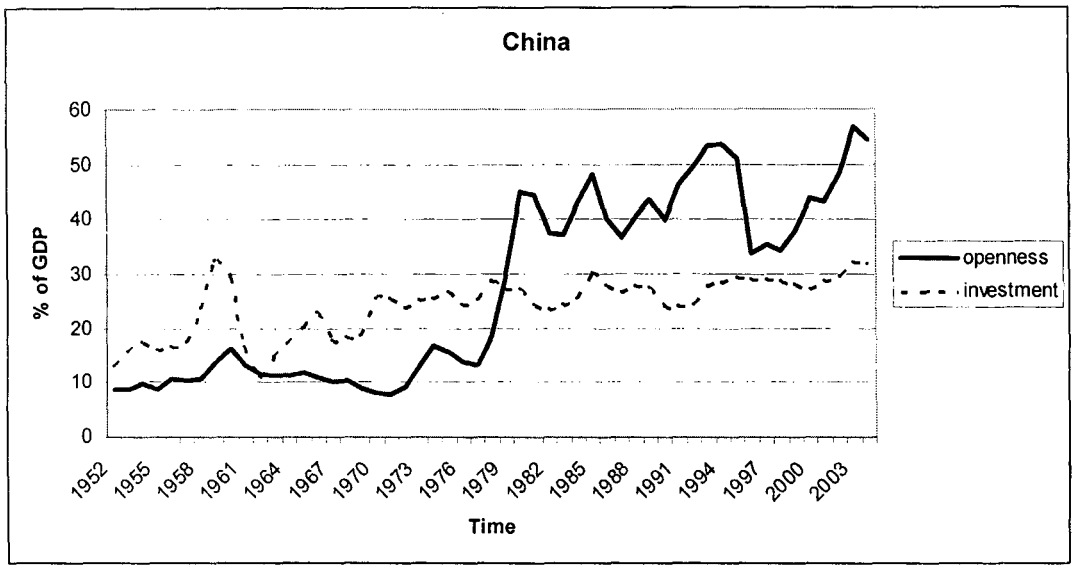
Both governments gave investment a big push. By the end of the 1950s in Taiwan and the early 1960s in Korea, economic growth had become a top priority for the leadership of the two countries. In Taiwan an important turning point was the Nineteen-Point Reform Program instituted in 1960, which contained a wide range of tax subsidies for investment and signaled a major shift in government attitudes toward investment. In Korea the chief form of investment subsidy was the extension of credit to large business groups at negative real interest rates. In addition to providing subsidies, the Korean and Taiwanese governments also played a much more direct, hands-on role by organizing private entrepreneurs into investments that they may not have otherwise made. Finally, public enterprises played a very important role in enhancing the profitability of private investment in both countries by ensuring that key inputs were available locally for private producers downstream. Not only did public enterprises account for a large share of manufacturing output and investment in each country, but their importance actually increased during the critical takeoff years of the 1960s.

SEZ played the most important role in China's openness

In the wake of reform period in 1979, China's motive was to stimulate the entire national economic development through exports, foreign technology and investment by creating SEZs. Thus the country seriously attempted to diversify the economies of the areas surrounding SEZs by investing in agriculture and mining. It also accommodated the flood of workers by building housing and providing social and educational services for them (Rondinelli, 1987). Development of new industries took place in SEZs which may not otherwise exist in China.

As a result of this serious effort, increase in openness was very sudden just after 1979. As the diagram shows, openness increased in a big leap by 1979 when China established SEZs.

Diagram 4: Openness and Investment in China



In case of attracting foreign investment, China has proved to be the most outstanding performer. The large potential domestic market was a great incentive for investors. Among all the Asian countries that have established EPZs/SEZs, China is one of the exceptional cases in terms of achieving regional development through it (Amirahmadi and Weiping, 1995).

China was the largest developing country recipient of FDI, and the third largest recipient of FDI in the world, after the United States and the United Kingdom. This reflects China's significant progress in offering a business environment conducive to FDI since 1978, and FDI has consequently played an important role in the country's economic development for a quarter of a century (Trade Policy Review, 2006).

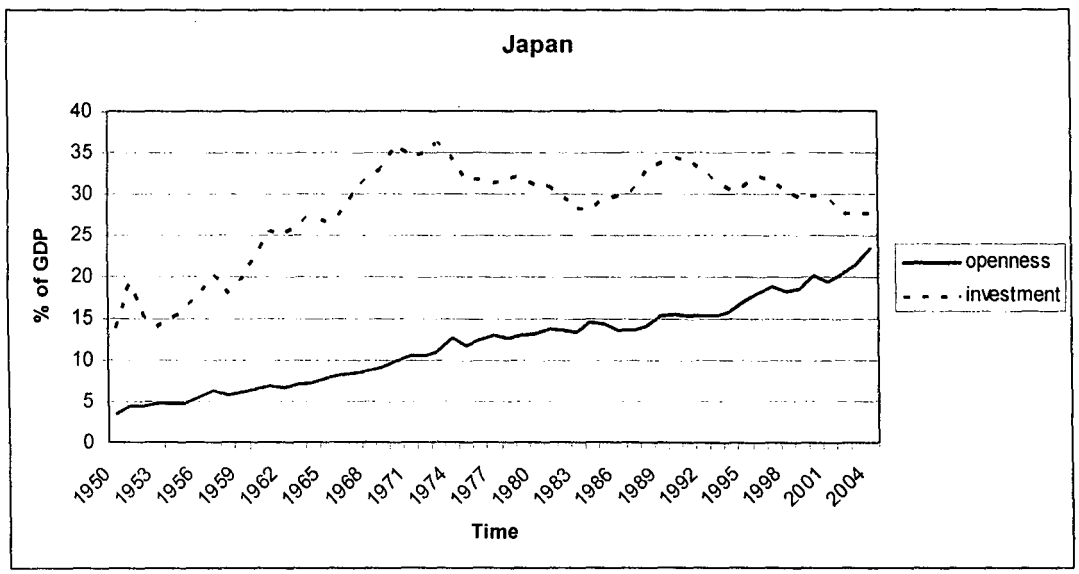
Chinese government made a very wise decision of inviting the foreign firms to establish only joint ventures with Chinese firms. So the domestic firms which were able to adopt foreign technology were able to export sophisticated goods. The intellectual property right was kept low, so that Chinese firms can do reverse engineering and export cheaper version of hi-tech goods. The remaining firms enjoyed the traditional comparative advantages of cheap labour and exported labour-intensive goods.

So China on one hand enjoyed the advantage of abandoned labour, on the other hand, due to wise government policy it exported such sophisticated goods which are generally exported by countries whose per capita income is very high (nearly six times) compared to China. (Rodrik, 2006)

Investment was always higher than openness in Japan

In Japan the need to produce exportables was different. Japan being poor in natural resources and arable land, had to import food and energy. Exports were needed to pay for these imports. Japan's exports were mainly manufactured goods, which were produced under technology of scale economics. Therefore, to extract full utilisation of capacity investment had to be always huge.

Diagram 5: Openness and Investment in Japan



The diagrammatic relation between investment and openness makes it clear, that although there is no short run causation from investment to openness, investment as a share of GDP is always huge and above openness as a share of GDP.

Chapter 5: Causality between Openness and Investment in India

After studying the causality between openness and investment for East Asian countries, this chapter will focus on India. We want to examine the causation between openness and investment for the Indian economy for two time periods, pre and post the initiation of economic reform in 1991. The chapter is divided into the following sections:

a) The background to the Indian reforms
b) The trends in Indian trade and investment over the time period, 1970-2005
c) Data, method and results
d) Inference

5.1 The background to the Indian reforms

India was a latecomer to economic reforms in comparision with the East Asian countries. In the 1960s when East Asian countries like South Korea and Taiwan had already adopted an export oriented policy, India adhered to an Import Substituting Industrialization (ISI) strategy. During 1950s India's motive was self-sufficient economic growth and the grand economic theories, such as 'big push' theory and the Mahalanobis model played a major role in industrial strategy. Indian policy makers also believed that strengthening of the industrial sector that would result from the adopted strategy was necessary for any successful export effort as India depended on a few.

But faced with a severe BOP constraint since 1957-58, Indian policy makers adopted several export promotion measures (measures are discussed in the next section). These policies were successful and by the third year of the 3rd Five Year Plan the target for the plan had already been achieved. But then drought and the cut-off of aid by the US and the World Bank derailed the entire process. In 1967 India again adopted a process of liberalisation, but under the pressure of World Bank (liberalisation policies are discussed in the next section).

Increase in the oil price in the late 1970s contributed to Balance of Payment (BOP) difficulties. So India placed emphasis on export promotion policies in the 1980s (export promotion policies are discussed in the next section), expecting exports would provide foreign exchange needed for the import of oil and high-technology capital goods.

Pressure on the BOP continued throughout the 1980s due to a large amount of oil, machinery and raw material imports and poor export performance. The situation worsened with the attempted takeover of Kuwait by Iraq in August 1990, which led to a temporary but sharp increase in the oil price. In 1990, the Indian trade deficit reached a record level. Also with the war many Indians working in that regions were repatriated and remittances from that region declined. In the wake of this exceptionally severe BOP crisis loans from commercial banks and deposits from non-resident Indians which had become major sources of BOP financing in the 1980s slowed and the Indian government approached the IMF for BOP assistance. IMF conditionality insisted on liberalization and thus began the process of reform in 1991 signalling a shift to a more open economy with greater reliance on market forces (Ahluwalia, 2002).

In this chapter we will test the causality between investment (gross domestic capital formation as a % of GDP) and openness (export plus import as a % of GDP) in the pre-reform and post reform periods. We divide the entire period into two helping order to study whether the economic reforms had any effect on the causality. But the division of periods into pre and post 1991 does not reflect an accurate division. Since 1991 was the crisis year, including it in the post reform period would be misleading. Therefore, for empirical purpose, we will take the post reform period from 1992 onwards.

Before testing the causality between trade and investment, we study their behaviour over the period.

5.2 Trends in trade

In order to study India's trade structure, we have divided the pre-reform period as prior to the 1970s, 1971-1980 and 1981-1990. The post reform period is also divided into 1992-1999 and the more recent period 2000-2005. Unless another source is mentioned, all the data are taken from the Reserve Bank of India's *Handbook of Statistics on the Indian Economy*. In general the Indian year is written as fiscal year e.g. 1960-61, which would run from April 1960 to March 1961. But to keep the same convention as in previous chapters we will write 1960-61 as 1960 as the fiscal year is composed largely of the months of 1960.

5.2.1 Prior to the 1970s

Export

Prior to the 1970s agricultural products like tea, cotton and cotton made products (cotton yarn, fabrics, and ready-made garments), jute and jute made products were the main exports from India. Apart from these Oil cakes, tobacco, cashew kernels and spices were also exported.

Mahalanobis model played a major role in industrial strategy in the 2nd Five Year Plan, which increased the imports of heavy machineries and capital goods. Thus India faced a severe BOP deficit in 1957-58. So the policy makers adopted several export promotion measures.

Export subsidisation policies took essentially two major forms: (1) fiscal measures, and (2) import entitlement schemes (Bhagwati and Srinivasan, 1975).

Among the fiscal measures exemptions from sales tax on final sales, direct tax concessions, refund of indirect taxes and concessions on rail freight were important. In addition to these direct fiscal measures, there were also other export promotion policies: (a) Budgetary grants for promotional activities, such as the Market Development Fund.

This fund financed the activities of the numerous Export Promotion Councils, research exhibitions and market surveys needed to gear export expansion (b) Special allocations of scarce items to the exporters at controlled prices, including priority access to rail space and allocations of domestic materials, such as iron and steel, etc.

Under the import entitlement schemes, eligible exporters received import licenses. By early 1965 the import entitlement schemes already had a very considerable coverage. The most important feature of these schemes was that a specified percentage of the value of exports was allowed to be used for importing raw materials and components required in the production of the export products.

In addition to these measures, which improved the direct profitability of export sales, there were also some promotional activities like budgetary appropriations for market development. This indirectly raised the profitability of foreign sales to domestic producers and traders (Bhagwati and Srinivasan, 1975).

Due to cut-off of the US aid and the pressure from World Bank India was forced to adopt further process of liberalisation in 1967.

The major change in method of export subsidisation in 1967 was the large-scale introduction of cash subsidies on an explicit basis. These were introduced for most engineering goods and chemicals and were successively extended to a number of items. By the end of 1967, they embraced the bulk of engineering goods, chemicals, processed foods, paper products, sports goods, woolen carpets, steel scrap, prime iron and steel and cotton textiles.

Although the import entitlement schemes were abolished with the 1966 devaluation, they were soon replaced in the same year by import replenishment schemes. Under the latter, exporters were again assigned import licenses of a value which was a pre-specified percentage of the export value.

1967 was characterised by three other measures which amounted to direct subsidisation of the export sector: (1) drawbacks and rebates on import and excise duties paid on direct inputs; (2) subsidisation through the State Trading Corporation of a growing range of exports; and (3) subsidisation of freight rates (Bhagwati and Srinivasan, 1975).

Grants were given to exporters to promote participation in exhibitions abroad. The promotional subsidies extended not merely to participation in foreign exhibitions and overseas expenses, but also to visits of foreign delegations to India. There were also income tax concessions on all export marketing expenditures. In addition, the government continued to expand credit facilities to exporters.

During 1969, export credits up to 10 years were given to the exporters at 6 % interest rate if certain conditions were fulfilled, like low import-content and repayment in hard currency. Even these conditions were occasionally waived.

Imports

Prior to the Green revolution India used to import food-grains on a large scale and such imports were reduced with the increase in food-grains production because of policy changes which came to be called the Green revolution. India also used to import capital goods and petroleum in large amounts. The value of imports was much higher than the value of exports. For the entire period of the 1960s India had a very large trade deficit. The BOP position is shown in the following table.

Table 12: BOP of India Prior to 1970s

(Rupees crores)

Item		1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
I.	Merchandise										
	A) Exports, f.o.b.	647	730	602	540	597	640	635	669	576	633
	B) Imports, c.i.f.	650	964	633	592	690	773	1102	1233	1029	932
	Trade balance (A-B)	-3	-234	-31	-52	-93	-133	-467	-564	-453	-299
II.	Invisibles, net	42	71	91	100	99	140	154	133	126	113
III.	Current account (I+II)	39	-163	60	48	6	7	-313	-431	-327	-186
IV.	Capital account (A to F)	-10	-2	-43	-2	-7	11	37	137	285	194

	A)	Foreign investment	4	4	4	8	8	24	21	3	10	52
	B)	External assistance, net	-5	47	22	-10	-10	6	27	36	218	175
	C)	Commercial borrowings, net	.	.	.	.	.	.	.	.	.	.
	D)	Rupee debt service	.	.	.	.	.	.	.	.	.	.
	E)	NRI deposits, net	.	.	.	.	.	.	.	.	.	.
	F)	Other capital	-9	-53	-69	0	-5	-19	-11	98	57	-33
V.	Overall balance (III+IV)		29	-165	17	46	-1	18	-276	-294	-42	8
Item			1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
1			12	13	14	15	16	17	18	19	20	21
I.	Merchandise											
	A)	Exports, f.o.b.	631	668	681	802	801	785	1087	1260	1367	1405
	B)	Imports, c.i.f.	1106	1006	1097	1245	1421	1368	1991	2062	1792	1576
	Trade balance (A-B)		-475	-338	-416	-443	-620	-583	-904	-802	-425	-171
II.	Invisibles, net		83	31	62	94	152	73	61	-5	15	-63
III.	Current account (I+II)		-392	-307	-354	-349	-468	-510	-843	-807	-410	-234
IV.	Capital account (A to F)		344	243	340	384	412	528	760	854	507	502
	A)	Foreign investment	28	30	0	26	47	18	31	37	28	24
	B)	External assistance, net	219	214	343	388	544	475	822	831	645	469
	C)	Commercial borrowings, net	.	.	.	.	.	.	.	.	.	.
	D)	Rupee debt service	.	.	.	.	.	.	.	.	.	.
	E)	NRI deposits, net	.	.	.	.	.	.	.	.	.	.
	F)	Other capital	97	-1	-3	-30	-179	35	-93	-14	-166	9
V.	Overall balance (III+IV)		-48	-64	-14	35	-56	18	-83	47	97	268

In the First Five Year Plan (1951-1956) import controls were relaxed through the expansion of the Open General Licensing (OGL) list. But foreign exchange crisis in 1956 and 1957 put an end to this and import controls were restored. External assistance in 1958 helped to reduce the overall deficit and continued to reduce overall deficit throughout the 1960s. After the Green revolution in 1968 there was a major reduction in food-grain import which reduced the trade deficit and India experienced an overall surplus.

5.2.2 1970-1979

Exports

Manufactures became main exports in the 1970s. Pearls, precious and semi precious stones became major export, followed by leather manufactures and cotton manufactures. Santacruz EPZ in Mumbai started operating in 1973. Although there were incentives and facilities provided in EPZs, Foreign Direct Investment (FDI) policy was highly restrictive. Among the agricultural exports, only tea was important.

During the 1970s government adopted export promotion through import liberalisation. There has been an increased emphasis on enhancing maintenance imports in order to promote capacity utilisation. A unique feature of trade reforms in India during this period has been that it has almost exclusively focused on the intermediate and capital goods import with little change in import control on consumer goods import.

Imports

Crude and partly refined petroleum were the major imports followed by machinery and fertilizer. Due to Green revolution food-grain imports declined. The BOP situation during the period is shown in the following table.

Table 13: BOP of India in the Period 1970-1979

(Rupees crores)

Item			1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
I.	Merchandise											
	A)	Exports, f.o.b.	1418	1581	1994	2357	3195	4180	5140	5440	5594	6313
	B)	Imports, c.i.f.	1826	2055	2161	2867	4482	5362	5450	6038	7806	9753
	Trade balance (A-B)		-408	-475	-168	-510	-1287	-1183	-310	-597	-2212	-3440
II.	Invisibles, net		-37	-24	-144	1646	331	1005	1204	1722	1974	2887
III.	Current account (I+II)		-445	-499	-312	1135	-956	-178	894	1124	-238	-553
IV.	Capital account (A to F)		435	519	279	-1113	478	790	808	710	1312	880
	A)	Foreign investment	36	44	30	52	69	-8	-26	-10	24	70

	B)	External assistance, net	504	508	377	-1223	854	1219	1270	882	455	656
	C)	Commercial borrowings, net	16	10	54	72	156	231	163	34	164	44
	D)	Rupee debt service	.	.	.	.	.	.	.	.	.	.
	E)	NRI deposits, net	0	0	0	0	0	36	167	200	156	162
	F)	Other capital	-121	-43	-182	-14	-601	-688	-766	-396	513	-52
V.	Overall balance (III+IV)		-10	20	-33	22	-478	612	1702	1834	1074	327

In common with other oil-importing developing countries, India experienced a severe external shock in 1973 when oil prices quadrupled. But India adjusted to the shock much quickly and the current deficit, which peaked in 1974, turned to a surplus in 1975. This happened due to three main factors – a)increase in external assistance from IMF, b)increase in invisible inflow or the foreign-currency remittances from Indian workers who had gone abroad, especially to the Gulf countries in the wake of the oil boom and c)exchange rate movements which were highly favourable to exports from 1972 onwards. In June 1972 the rupee was delinked from the dollar and pegged to the pound sterling, which proved to be a weak currency, depreciating substantially against most currencies in the subsequent two years. As the rupee depreciated with the pound, the index of the nominal exchange rate of the rupee against the currencies of India's major trading partners depreciated by about 11% from the average level in 1972 to the average in 1975, which provided a strong stimulus for exports (Aluwalia, 1986).

Another important feature of the adjustment after the first oil shock is that it was accomplished with an acceleration in economic growth, with GDP growth averaging about 5.1% in the period 1974 to 1978 compared with the earlier trend rate of about 3.5%. The main reason for this acceleration was the improvement in agricultural performance in this period (Aluwalia, 1986).

5.2.3 1980-1990

Exports

Manufactures continued to provide the major share of export earnings. Share of pearls, precious and semi precious stones increased in exports of manufactures, followed by fabrics. Fish, fish products and tea were important primary exports.

Export promoting reforms

Abolished in 1956, OGL was re-introduced in 1976 with 79 capital goods items on it. The number of capital goods items included in the OGL list expanded steadily reaching 1007 in 1987, 1170 in 1988 and 1,329 in 1990 (Panagariya, 2004).

A few more EPZs were established in 1984. These were at Noida (Uttar Pradesh), Falta (West Bengal) Cochin (Kerala) and Chennai (Tamil Nadu). All these zones with the exception of Chennai were set up in industrially backward regions to bring about balanced development.

From 1985 Replenishment (REP) licenses—which allowed the holder to import items on the restricted list—were given to exporters in amounts that were approximately twice their import needs, thus providing a source for imports of goods that could be sold in the domestic market at a large profit.

In the 1985 budget, 50 percent of business profits attributable to exports were made income tax deductible; in the 1988 budget this concession was extended to 100 percent of export profits.

The Import-Export Policy undertaken in the period 1985-1988 replaced import quotas with tariffs. This represented a major overhaul of the Indian trade policy as previously the trade barriers mostly took the form of quantitative restrictions.

Imports

Crude and partly refined petroleum continued to be the major import. Share of machinery, iron and steel, pearls, precious and semi precious stones increased. The very fact that the share of pearls, precious and semi precious stones increased simultaneously in exports and imports, suggests that the export of these goods thrived on the re-processing of imported inputs.

The export promoting reforms like re-introduction of OGL and expanding the list of importables boosted import volume. The inclusion of an item into the OGL list was usually accompanied by a tariff reduction on that item. The items on the list were mainly machinery or raw materials for which no substitutes were produced at home (Panagariya, 2004).

India experienced a second severe external shock in 1979 when oil prices more than doubled. The BOP situation is shown in the following table.

Table 14: Indian BOP of India in the Period 1980-1990

(Rupees crores)

Item			1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
I.	Merchandise												
	A)	Exports, f.o.b.	6666	7766	9137	10169	11959	11578	13315	16396	20647	28229	33153
	B)	Imports, c.i.f.	12877	14260	15857	17093	18680	21164	22669	25693	34202	40642	50086
	Trade balance (A-B)		-6211	-6494	-6719	-6925	-6721	-9586	-9354	-9296	-13556	-12413	-16934
II.	Invisibles, net		4000	3656	3438	3610	3850	3630	3524	3006	1976	1026	-433
III.	Current account (I+II)		-2214	-2839	-3280	-3316	-2873	-5956	-5830	-6293	-11580	-11389	-17367
IV.	Capital account (A to F)		1315	2586	2010	2738	3740	5514	5770	6545	11678	11617	12895
	A)	Foreign investment	.	.	.	.	.	.	249	563	517	683	184
	B)	External assistance, net	1112	746	1125	1183	1407	1676	1808	2945	3210	3090	3965
	C)	Commercial borrowings, net	199	146	732	785	1110	1167	2513	1266	2743	2958	4034
	D	Rupee debt	.	.	.	.	.	.	.	.	.	.	-

	)	service											2140
	E)	NRI deposits, net	178	206	383	709	879	1767	1650	1840	3636	4000	2756
	F)	Other capital	-177	-513	-228	59	342	904	-450	-69	1572	886	4096
V.	Overall balance (III+IV)		-899	-2253	-1270	-578	867	-442	-60	253	98	228	-4471

India faced a second oil shock after 1979. The adjustment to the second oil shock differed greatly from the adjustment to the first one. Assistance from IMF was in its place but foreign borrowing also led to a rapid accumulation of foreign debt. Invisible inflow could not cover the trade deficit in the way they had done after 1974, entirely because of changed international circumstances. Unlike the first oil price rise, the second one did not generate a sustained oil boom in the Gulf, partly because the world economy slowed down considerably with the volume of oil exports declining consequently, and partly because of political developments in the Gulf region, especially the Iran-Iraq War.

In 1990 there was a huge trade deficit of Rupees 16934 crores. At the same time there was a deficit in the invisible account of Rupees 433 crores. Generally this invisible income was in surplus and balanced the trade deficit. But the Gulf War between Kuwait and Iraq in 1990 left many Indians jobless there. They were a big source of this income inflow. At the same time in 1990 the amount of foreign investment declined from Rupees 683 crores in 1989 to Rupees 184 crores. So due to this accidental decline of invisible net income and reduction of foreign investment there was a record deficit and India had to enter into an IMF structural adjustment programme in 1991.

5.2.4 1992-1999

Exports

Cotton textile, readymade garments were the major manufacturing exports. Gems and jewellery were also important; India had become the world's largest processor of diamonds, followed by pharmaceuticals and cosmetics. Fish and fish products and rice became the main primary export.

Export promoting reforms

Post reform EXIM (export and import) policies aimed at increasing capabilities of the export sectors by enhancing productivity and promoting modernisation and competitiveness. A few of them are listed.

There was a reduction in the list of agricultural products that cannot be exported. In order to promote the exports of agricultural, horticultural and meat products, agricultural and processed food products Export Development Authority (APEDA) provided financial assistance for purposes of market development, packaging development and quality control, etc.

Duty Free Replenishment Certificate (DFRC) was issued to exporters of manufactures for the duty free import of inputs such as raw materials, components, intermediates, consumables, spare parts, including packing materials to be used for export production. Export Promotion Capital Goods Scheme (EPCG) was introduced in order to enable exporter to import machinery and other capital goods for export production at concessional or no customs duties at all. This facility is subject to an export obligation, i.e., the exporter is required to guarantee exports of a certain minimum value, which is a multiple of the total value of capital goods imported.

Duty Drawback (DBK) Scheme was administered by the Directorate of Drawback, Ministry of Finance. Under this scheme, an exporter was entitled to claim refund of customs duty paid on the import of raw materials, components and consumables, and of central excise duty paid on indigenous raw materials and components.

The country provided tax exemption to exporters on export earnings under section 80 HHC provision of the Income Tax Act. Exported goods were exempted from sales tax, provided the exporter or his firm is registered with the Sales Tax Authorities.

To facilitate easier creation/expansion of production capacities for export, necessary relaxations were provided in the policies for industrial licensing, MRTP (Monopolies and Restrictive Trade practices Act) and Foreign Exchange Regulations. The Foreign Exchange Regulation Act was also liberalised and Foreign Exchange Management (FEMA) Act, 1999 has been operationalised.

The export sector in India has also been given an interest subsidy. Working capital was made available by the banks to the export sector at a concessional or subsidised rate of interest. Working capital required for pre-shipment credit as well as post-shipment credit was provided to the export sector at a concessional rate of interest.

Imports

The import composition was more or less same as in the 1980s only with an increase in the volume. India imported diamonds in rough form from South Africa and fabricated them into jewelry for export. It became the world's largest processor of diamonds. The BOP situation is shown in the following table.

Table 15: BOP of India in the Period 1992-1999

(Rupees crores)

Item			1992	1993	1994	1995	1996	1997	1998	1999
I.	Merchandise									
	A)	Exports, f.o.b.	54761	71146	84329	108481	121193	132703	144436	162753
	B)	Imports, c.i.f.	72000	83869	112749	146542	173754	190508	199914	240112
	Trade balance (A-B)		-17239	-12723	-28420	-38061	-52561	-57805	-55478	-77359
II.	Invisibles, net		4475	9089	17835	18415	36279	36922	38689	57028
III.	Current account (I+II)		-12764	-3634	-10585	-19646	-16283	-20883	-16789	-20331
IV.	Capital account (A to F)		11881	30412	28745	15597	40502	37536	35034	48101
	A)	Foreign investment	1699	13282	15449	16312	21829	19961	10169	22501
	B)	External assistance, net	5748	5963	4798	3356	3998	3463	3484	3915
	C)	Commercial borrowings, net	-1095	1904	3238	4548	10004	14558	18557	1360
	D)	Rupee debt service	-2335	-3302	-3090	-3106	-2542	-2784	-3308	-3059
	E)	NRI deposits, net	6097	3780	539	3821	11894	4325	4060	6709
	F)	Other capital	1768	8786	7811	-9334	-4681	-1987	2072	16675

V.	Overall balance (III+IV)	-882	26779	18160	-4049	24220	16653	18245	27770

After economic reform, the BOP situation improved particularly from 1993. There were overall surpluses in 1993 and 1994. After the reform, foreign investment has increased significantly. But again India faced a huge overall BOP deficit in 1995 due to capital outflow of Rupees 9334 crores. Situation improved in 1996 with increase in commercial borrowing from Rupees 4548 crores in 1995 to Rupees 10004 crores in 1996.

5.2.5 2000-2005

Exports

At present handicrafts, gems and jewelry forms the most important export sector. India is building up new areas of strength in export markets, by moving to computer software exports, exports of pharmaceuticals and engineering manufactures. The share of textiles and ready-made garments are also important. Other significant exports include industrial machinery, leather products, chemicals and related products. Among manufactures the share of iron and steel products has risen. The share of automobile exports has also risen. Fish and fish products, rice remain the most important primary exports (Trade Policy Review, 2007).

Imports

The dominant imports are petroleum products and capital goods. Imports of transport equipment, gold and silver have increased. Other important import categories are chemicals, dyes, plastics, pharmaceuticals, uncut precious stones, iron and steel, fertilizers, nonferrous metals, and pulp paper and paper products (Trade Policy Review, 2007).The BOP situation is shown in the following table.

Table 16: BOP of India in the Period 2000-2004

(Rupees crores)

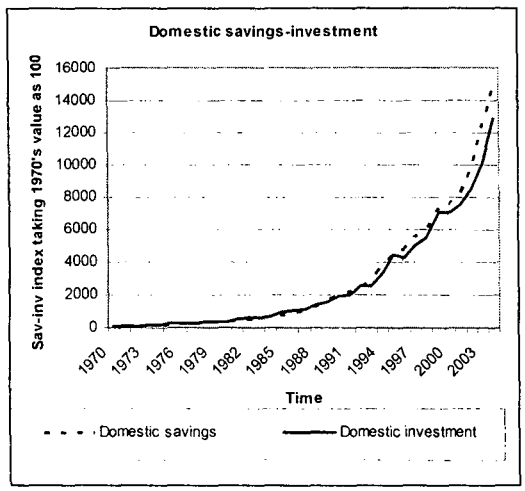
Item			2000	2001	2002	2003	2004
I.	Merchandise						
	A)	Exports, f.o.b.	207852	213345	260079	303915	381785
	B)	Imports, c.i.f.	264589	268300	311776	367301	533550
	Trade balance (A-B)		-56737	-54955	-51697	-63386	-151765
II.	Invisibles, net		45139	71381	82357	127369	139591
III.	Current account (I+II)		-11598	16426	30660	63983	-12174
IV.	Capital account (A to F)		39241	40167	51377	80010	128081
	A)	Foreign investment	31016	38861	29072	71728	68366
	B)	External assistance, net	2080	5819	-14863	-12553	8993
	C)	Commercial borrowings, net	20194	-7543	-8263	-13274	24149
	D)	Rupee debt service	-2760	-2457	-2306	-1756	-1858
	E)	NRI deposits, net	10561	13127	14424	16869	-4439
	F)	Other capital	-21850	-7640	33313	18996	32870
V.	Overall balance (III+IV)		27643	56593	82037	143993	115907

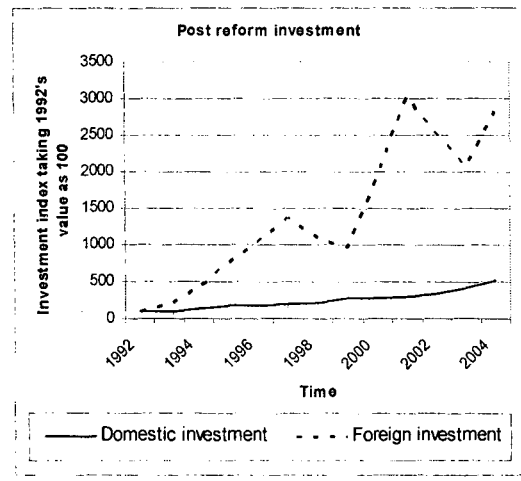
In spite of the export promotion policies the trade deficit continues. But invisible inflow and foreign investment inflow resulted in an overall surplus. Even in 2000, 2001 and 2004 there is evidence of external assistance outflow. The significant increase in invisible earnings is the outcome of service sector exports. So at present in India, the service sector exports balance the merchandise trade deficit.

5.3 Trends in investment

We now study the trends in both domestic and foreign investment in India. Gross capital formation as a sum of household sector, private corporate sector and public sector; is taken as domestic investment. On the other hand we have just taken Foreign Direct Investment (FDI) not the portfolio investment.

Diagram 6: Growth Rate of Domestic Savings, Investments and FDI





In the entire period 1970-2004, domestic investment has increased steadily. Although the rate of growth of domestic investment has grown after economic reform in 1991, compared to the huge growth rate of FDI, growth rate of domestic investment is low in the post reform period. FDI data is not available prior to 1990 in RBI.

After the liberalisation process started in 1991 India experienced continuous growth in annual FDI inflows. Just after the reform, inflow of foreign investment jumped from Rupees 174 crores in 1990 to Rupees 965 crores in 1992. Just the next year this value reached Rupees 1838 crores escalating to Rupees 27188 crores in 2004. Inward FDI has been particularly robust in the electronics and electrical equipment sector, mainly due to Information Technology Enabled Services (ITES) and Business Process Outsourcing (BPO) growth.

For the entire period, growth rate of domestic investment is more or less same as domestic savings. So we can say that foreign investment had neither 'crowding in' nor 'crowding out' effect for domestic investment.

Sharma (2000) studied the role of FDI in India's export performance, and found that FDI affects export positively but insignificantly. Arthreye and Kapur (2000) concluded that foreign capital is neither necessary nor sufficient for growth in India. So it is worthy of studying the role of domestic investment in the trade or openness of India.

5.4 Data, method and result

The data source is Reserve Bank of India's *Handbook of Statistics on the Indian Economy.* RBI export data is compiled by aggregating the economy wide financial transactions related to exports, as reported by exporting firms. Values of export, import, and GDP all are taken in constant prices and the unit is Rupees crores. The variable openness (OGDP) is defined as export plus import, as a % of GDP. Investment (IGDP) is defined as gross domestic capital formation as a % of GDP.

We have run Granger causality test between two variables openness (export plus import as a share of GDP) and investment (as a share of GDP). Granger causality test is a vector auto regression analysis, showing the direction of occurrence that is whether lagged 'variable1' affects 'variable2' or otherwise. It shows the direction running from one variable to other.

In our case the test involves estimating the following pair of regressions:

$$OGDP_t = \sum_{i=1}^{n} \alpha_i IGDP_{t-1} + \sum_{j=1}^{n} \beta_j OGDP_{t-1} + u_{1t} \quad \text{.....(1)}$$

$$IGDP_t = \sum_{i=1}^{n} \lambda_i IGDP_{t-1} + \sum_{j=1}^{n} \delta_j OGDP_{t-1} + u_{2t} \quad \text{.....(2)}$$

Where it is assumed that the disturbances u_{1t} and u_{2t} are uncorrelated.

This causality can be one way only, either ways, or no causality. To run Granger causality test we first have to see whether the variables are stationary or not. This is because; the time trend or non stationary characteristics of the data can affect the

reliability of the result. Openness and investment were non stationary. We made them stationary by taking first difference (Appendix 4).

To check for the optimal lag, we run the Vector Auto Regression (VAR) test, and from Akaike-Schwarz criteria, we found the optimal lag to be 2. Then Granger causality test was run by taking 2 lags. All econometric estimations in this paper have been carried out using *Eviews 3.1.* The results are given below in a tabular form (for detailed resuls see Appendix 5).

Table 17: Results of Causality Test between Investment and Openness in India

India	IGDP → OGDP	OGDP → IGDP	IGDP → OGDP and OGDP → IGDP	No causality
1970-2005				√**
1970-1990				√**
1992-2005				√**
*** implies significant at 1% level ** implies significant at 5% level * implies significant at 10% level				

We found no causality between openness and investment for all the three time periods, whether pre and post liberalization period taken together or separately.

Next we repeat the entire procedure by taking two variables, export as a % of GDP (EGDP) and investment as a % of GDP (IGDP). The test involves estimating the following pair of regressions:

$$EGDP_t = \sum_{i=1}^{n} \varepsilon_i IGDP_{t-1} + \sum_{j=1}^{n} \phi_j EGDP_{t-1} + u_{3t} \quad \text{.....(3)}$$

$$IGDP_t = \sum_{i=1}^{n} \varphi_i IGDP_{t-1} + \sum_{j=1}^{n} \gamma_j EGDP_{t-1} + u_{4t} \quad \text{.....(4)}$$

Where it is assumed that the disturbances u_{3t} and u_{4t} are uncorrelated.

Data on export (EGDP) and investment (IGDP) were non stationary. We made them stationary by taking first difference (Appendix 6). In this case also optimal lag is 2. So Granger causality test was run by taking 2 lags. The results are given below in a tabular form (for detailed result see Appendix 7).

Table 18: Results of Causality Test between Investment and Exports in India

India	IGDP → OGDP	OGDP → IGDP	IGDP → OGDP and OGDP → IGDP	No causality
1970-2005				√**
1970-1990				√**
1992-2005				√**
*** implies significant at 1% level ** implies significant at 5% level * implies significant at 10% level				

5.5 Inference

We found that investment has no causal relation with either openness or export. The absence of causality has not changed after the economic reforms in 1991. So we can conclude that the South Korean and Taiwan model does not hold for India. A few possible reasons can be:

1. India couldn't create an investment welcoming environment like South Korea and Taiwan. Indian labour market is inflexible. According to Krueger (1990) abundant labour and a well-functioning labour market facilitated the export sectors of East Asian countries.
2. Indian infrastructure is poor hampering investment incentives. Rapid growth in a globalised environment requires a well-functioning infrastructure, including especially electric power, road and railway connectivity, telecommunications, air transport and efficient ports. In these areas India lags behind nearly all East and South East Asian countries.
3. East Asian economies have been able to move rapidly from labour intensive to technology intensive manufactures, India has largely been left only with traditional labour intensive products despite beginning the industrialisation

process ahead of most of East Asia. Indian exports are dominated by simple and undifferentiated products where the main competitive advantage lies in cheap labor, low levels of skill and simple technologies (Lall, 1999). On the other hand East Asian countries have upgraded their export structures rapidly. India has, however, performed well in capturing the export market in the area of services trade, particularly in new and dynamic sectors like information and communication technology (ICT).

4. Excessive use of market borrowing to cover budget deficits has often put upward pressure on interest rates which crowded out borrowings and investment by the private sector.
5. The model provided by Rodrik (1995) assumes that the country can't borrow freely from the open market and thus needs exports to pay for the import. But India has been borrowing for a long period to balance its payments and thus reducing the importance of exports to pay back for the imports. So India doesn't fit into one of the basic assumptions of the Rodrik model.

Our empirical findings match the finding of Sharma and Panagiotidis (2005). They also found no causality between domestic investment and export for the period 1970-2000. Arthreye and Kapur (2000) concluded that foreign capital may be desirable but is not a substitute for policies to improve the incentives for long-term investment. We also found from the data that foreign investment has neither 'crowded in' nor 'crowded out' domestic investment in India.

Chapter 6: Conclusion

Trade and development is a well researched and highly debated area. On one hand, we have the popular belief of trade as 'an engine of growth', and on the other hand some economists believe that role of trade have been highly overstated. We found a new scope of study in the latter school of thought; does export led growth trace back to growth of investments?

Rodrik (1995) focused on the investment based argument for two East Asian countries, namely South Korea and Taiwan. He compared the situation with two non East Asian countries Chile and Turkey and concluded that East Asian growth has investment based explanation rather than trade based explanation. But the question arises: can the case study of only these two countries represent the entire East Asia?

The broad objective of this thesis is to examine the role of investment in the trade growth relation. The focus is threefold. First of all, we have studied the causal relation between investment and openness for all East and South East Asian countries like China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand. Second, we have studied in details, the export promotion policies of selective East Asian countries, namely South Korea, Taiwan, China and Japan. Third, we have checked for the same causality for India in the pre and post liberalisation era.

As depicted in chapter 3, our results on South Korea and Taiwan, more or less match Rodrik's (1995) findings. There were minor changes in the results after using the recent version of the same data set and up to current period (1953-2004 for South Korea and 1951-2004 for Taiwan). Our result found that investment Granger caused openness for both South Korea (significant at 5% level) and Taiwan (significant at 10 % level). Coming to the rest of the countries, we found that, for some of the countries, e.g., Indonesia, Singapore and Thailand, match the pattern of South Korea and Taiwan. But there are other countries like China, Japan, Hong Kong, Malaysia, Philippines, for those we find no causality between investment and openness.

Thus our first finding implies that, there is not only difference between the growth pattern of East Asian and non East Asian countries as suggested by Rodrik (1995); there is difference among the East Asian countries also. We can not generalise that investment led growth holds for all East Asian countries.

Chapter 4 mainly focused on the export promotion policies of four countries, South Korea, Taiwan (where investment Granger caused openness), China and Japan (where no causality was found between the two variables). After studying the export promotion policies of these countries, we are able to find some reasons behind the difference in causality.

The main difference which comes out to be, government policies in South Korea and Taiwan were helpful for the investment boom. The export boom in South Korea and Taiwan started in the mid 1960s whereas the incentives were there from nearly a decade ago. Government intervention through subsidy and tax incentives increased the profitability of investment in these two countries. At the same time, large and efficient well-educated labour force and a low endowment of physical capital ensured high return of investment. High profits of entrepreneurs and increased earnings for industrial labour force led to a very rapid rise in savings, which could supply the investment demand. As a result, there was an investment boom in these two countries. The investment required imported capital goods. Exports increased because it was needed to pay the huge import bills. At the same time, investment led to the full utilisation of capacity which further resulted in a boom in output. But the scenario was not so in either Japan or China.

Special Economic Zones (SEZs) played the most important role in China's openness. Development of new industries took place in SEZs as a result of this serious effort, which may not otherwise exist in China. So increase in openness was very sudden just after 1979, investment did not played a causal role.

In Japan the need to produce exportables was different. Japan being poor in natural resources and arable land, had to import food and energy. Exports were needed to pay for

these imports. Japan's exports were mainly manufactured good, which were produced under technology of scale economics. Therefore, to extract full utilisation of capacity investment had to be always huge leaving no room for causal relation between investment and openness.

Chapter 5 illustrates causality between investment and openness for another fast growing economy, India. Our empirical findings match some early findings of no causality between domestic investment and export for the period 1970-2000. Interestingly the causality does not change after the economic reform also. We find that investment has no causal relation with either openness or export. The absence of causality has not changed after the economic reforms in 1991. It implies that the South Korean and Taiwan model does not hold for India.

The model provided by Rodrik (1995) assumes that the country can't borrow freely from the open market and thus needs exports to pay for the import. But India has been borrowing for a long period to balance its payments and thus reducing the importance of exports to pay back for the imports. So India doesn't fit into one of the basic assumptions of the model.

Again inflexible labour market, poor infrastructure and traditional simple and undifferentiated export structure of India, differentiate India from other highly growing East Asian countries. In case of the pre and post reform investment structure, we find from the data that foreign investment has neither 'crowded in' nor 'crowded out' domestic investment in India.

To conclude, we have attempted to analyse the role of investment in the trade-growth relation, which remains another debated area and seeking for further research.

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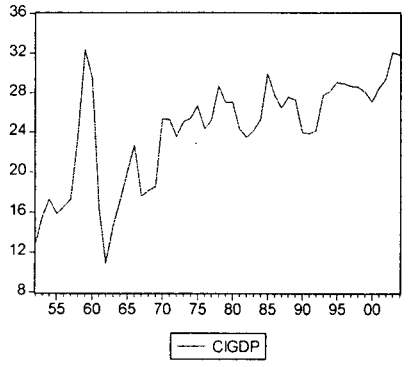
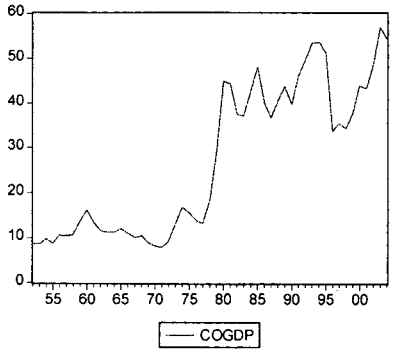
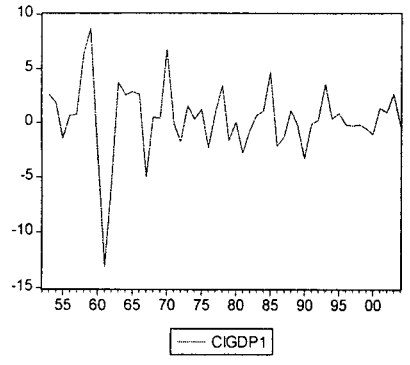
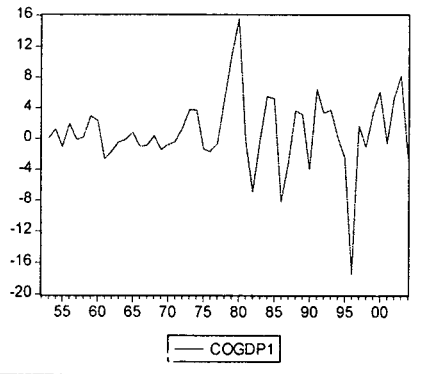
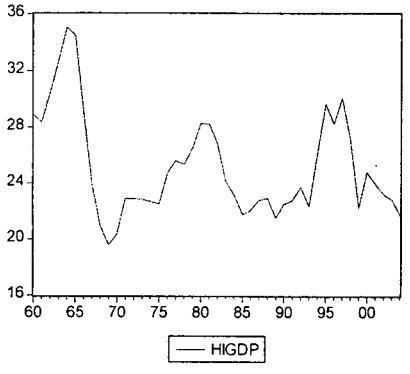
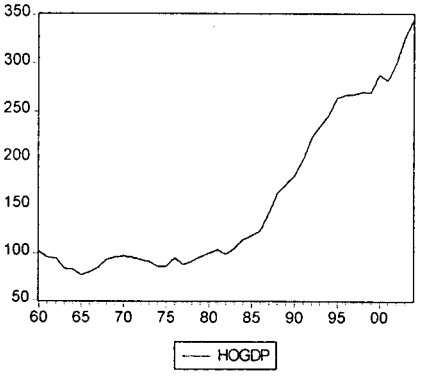
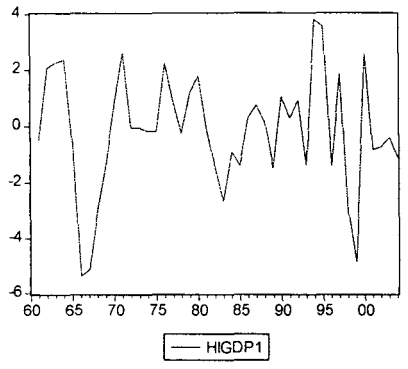
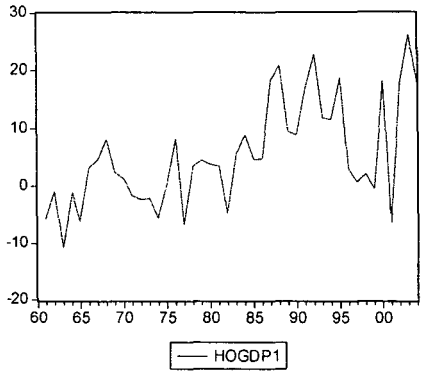
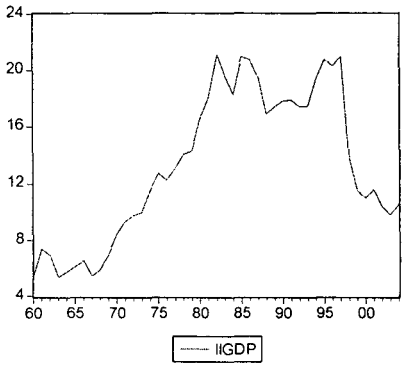
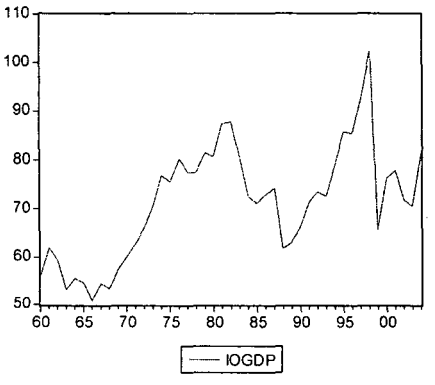
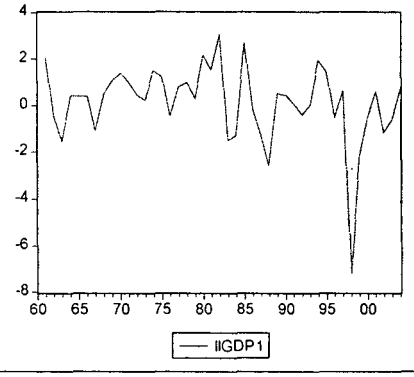
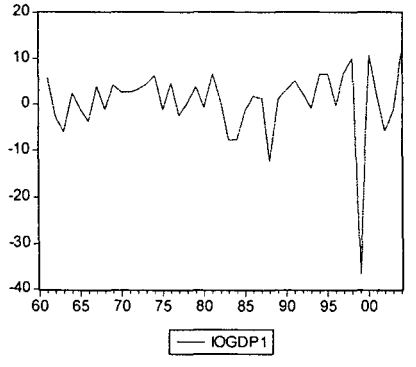
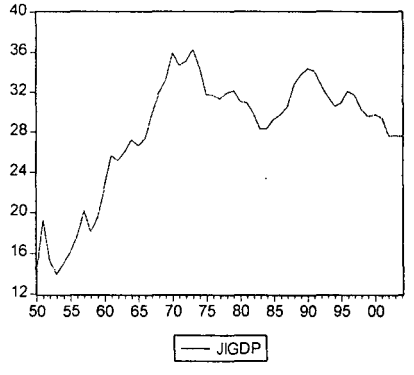
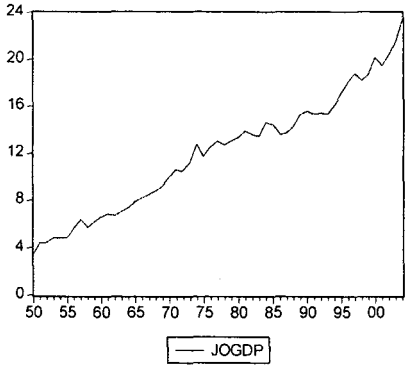
APPENDICES

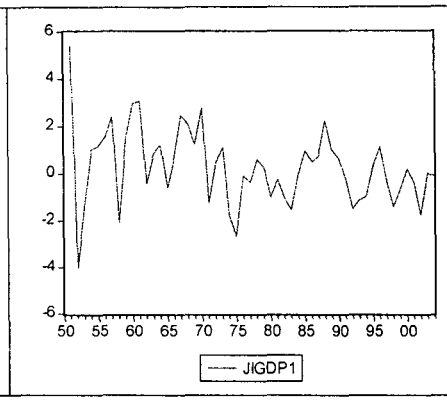
Appendix 1

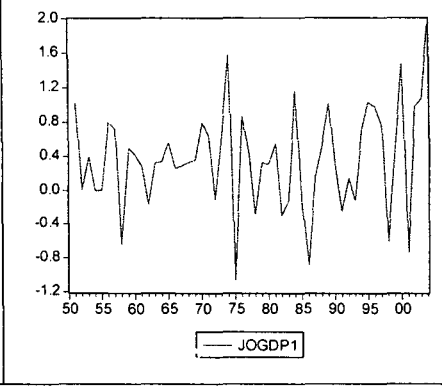
Growth and Exports in Latin America and East Asia: 1965-1989				
	Annual rate of growth of real GDP		Annual rate of growth of Exports	
	1965-80	1980-89	1965-80	1980-89
A. Selected Latin American Countries				
Argentina	3.5	-0.3	4.7	0.6
Brazil	8.8	3.0	9.3	5.6
Chile	1.9	2.7	7.9	4.9
Colombia	5.8	3.5	1.4	9.8
Mexico	6.5	0.7	7.6	3.7
Peru	3.9	0.4	1.6	0.4
Venezuela	3.7	1.0	-9.5	11.3
Latin America and Caribbean (Average)	6.0	1.6	-1.0	3.6
B. Selected East Asian Countries				
Hong Kong	8.6	7.1	9.5	6.2
Indonesia	8.0	5.3	9.6	2.4
Korea	9.6	9.7	27.2	13.8
Malaysia	7.3	4.9	4.4	9.8
Singapore	10.1	6.1	4.7	8.1
Thailand	7.2	7.0	8.5	12.8
East Asia (Average)	7.2	7.9	10.0	10.0
Source: World Bank (1989, 1990)(as cited in Edwards1993)				

Appendix2

Country	Igdp and igdp1	Ogdp and ogdp1
China		
		
Hong Kong		

		
Indonesia		
		
Japan		





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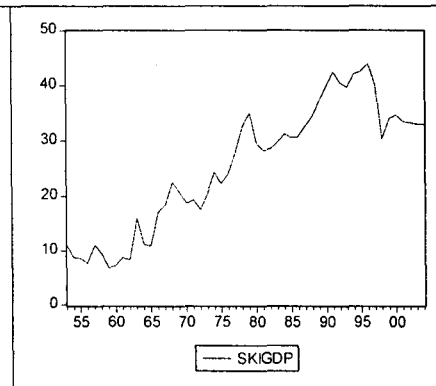

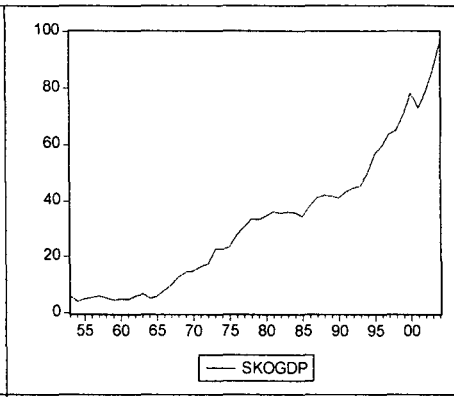

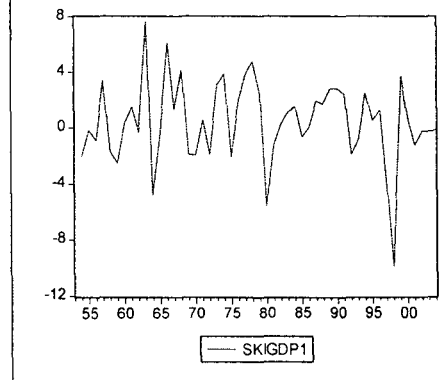

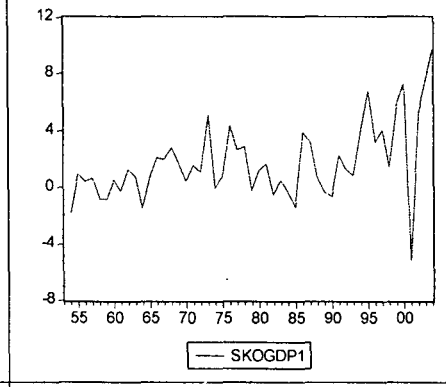

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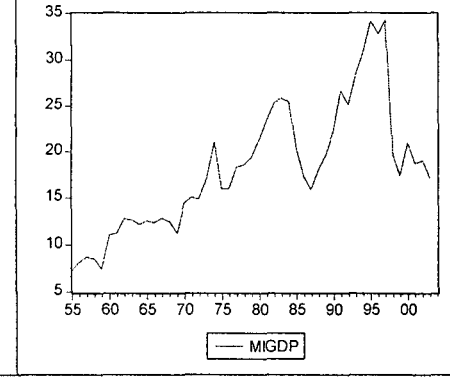
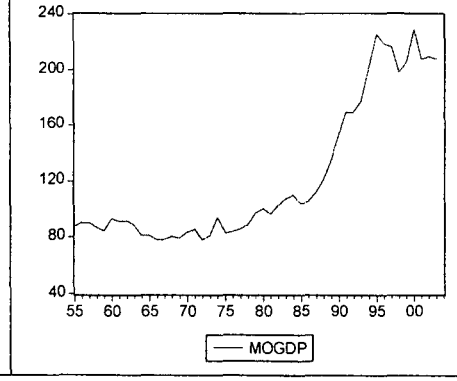
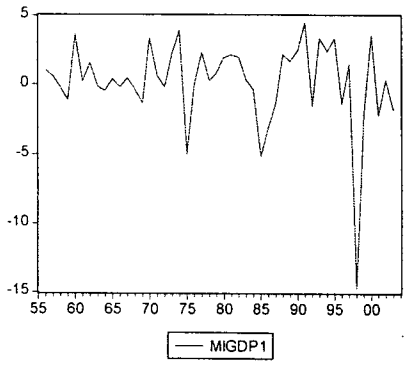
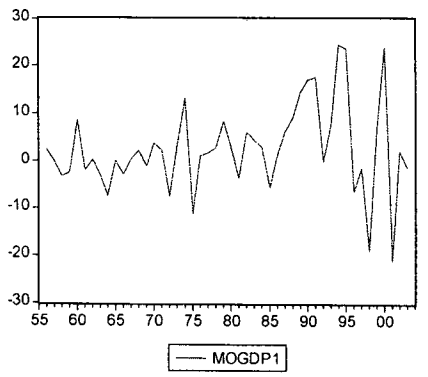
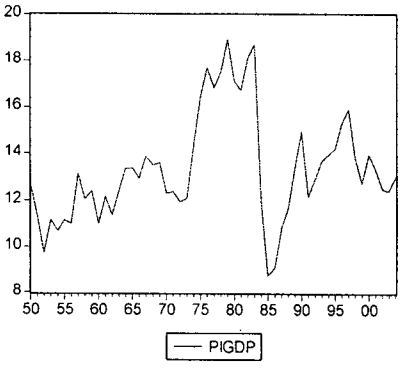
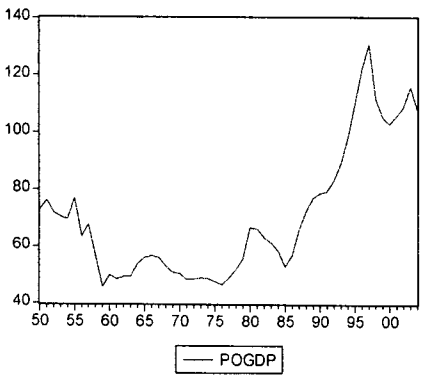
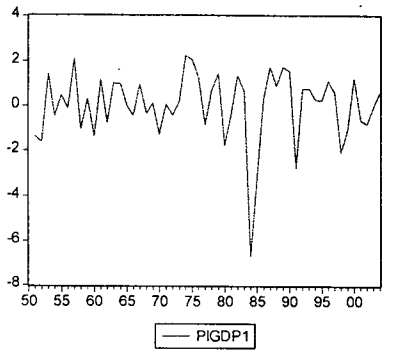
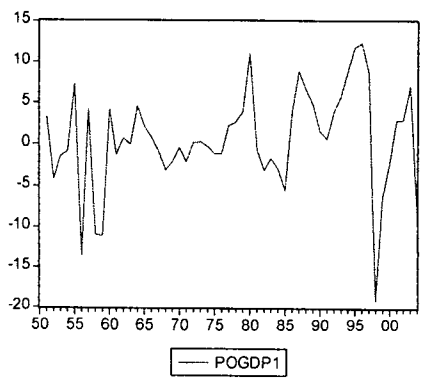
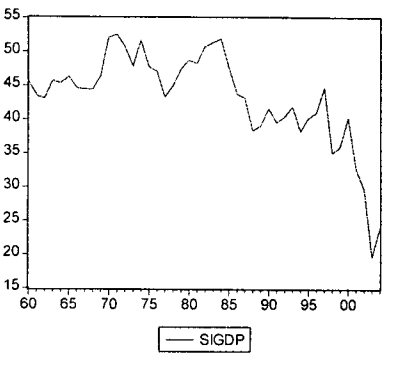
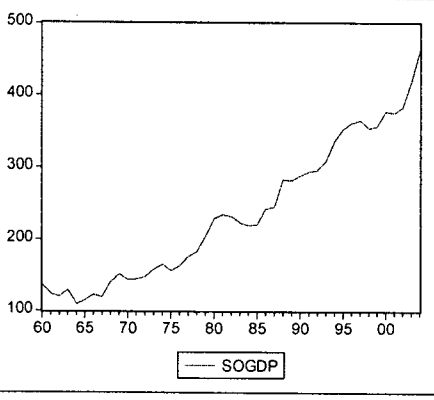
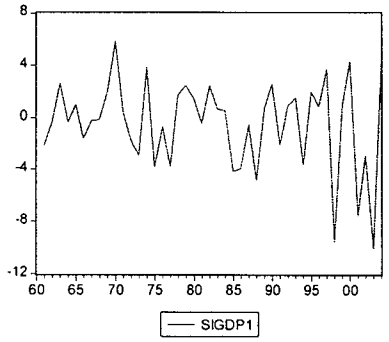
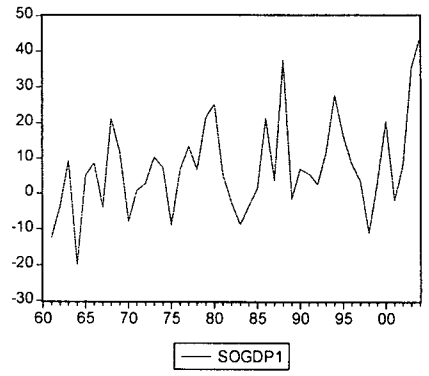
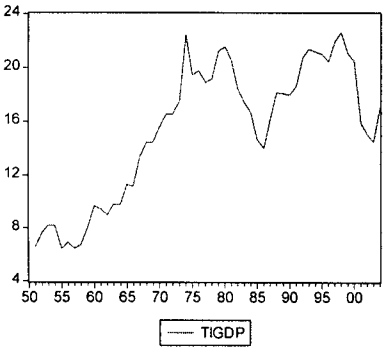
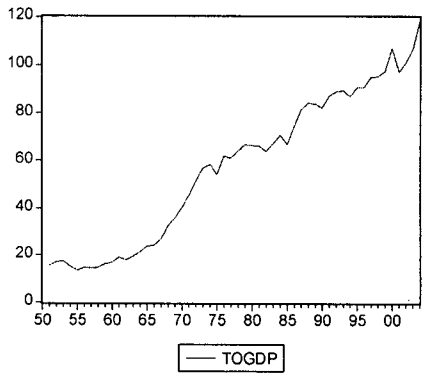
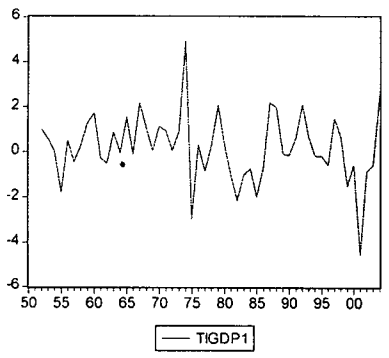
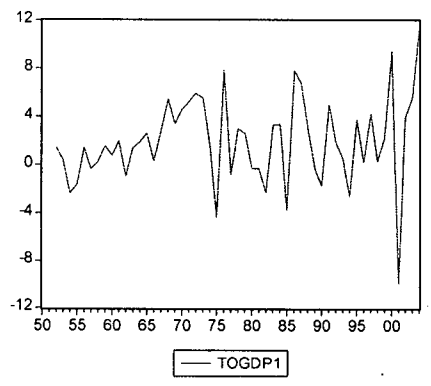
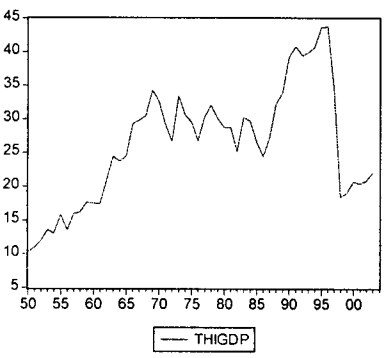
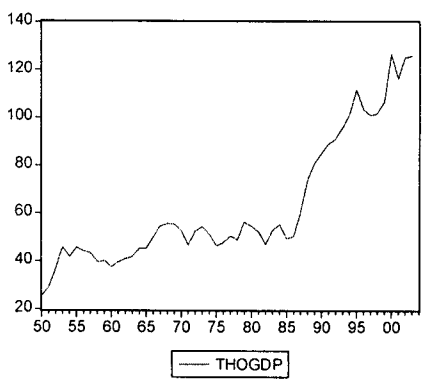
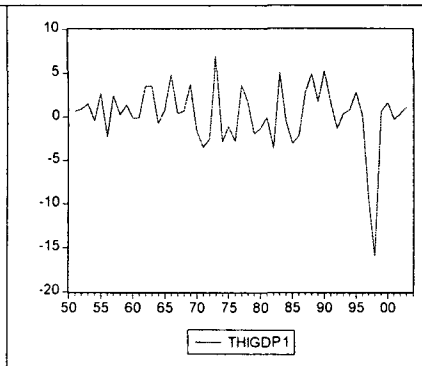
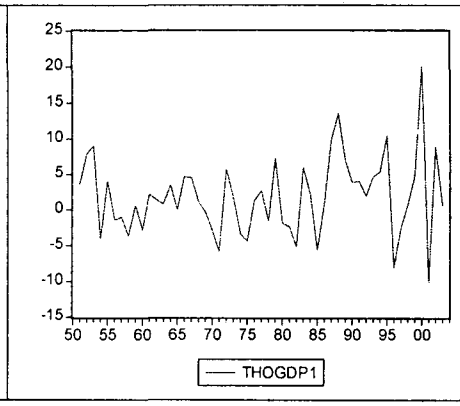




		
Philippines		
		
Singapore		

		
Taiwan		
		
Thailand		





Source: Penn World Table

Appendix 3

Since our interest is in testing for causality, the estimated coefficients of the models (1) and (2) are not needed. the F distribution follows m and (n-k) degrees of Freedom (df) (where m is equivalent to no. of lagged terms, n is number of parameters and K is number of parameters to be determined in the model. If the computed value exceeds the critical F value at the chosen level of significance (from the F-table), we reject the null hypothesis.

Pairwise Granger Causality Tests
Date: 03/04/08 Time: 19:49
Sample: 1952 2004
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
CIGDP1 does not Granger Cause COGDP1	50	0.06070	0.94118
COGDP1 does not Granger Cause CIGDP1		0.45966	0.63443

The critical F value is 3.19 (5%level) and 2.40(10% level)(for 2 and 48 df). Therefore we do not reject any of the hypotheses. There fore there is no causation.

Pairwise Granger Causality Tests
Date: 03/04/08 Time: 20:05
Sample: 1960 2004
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
HIGDP does not Granger Cause HOGDP1	42	2.34811	0.10963
HOGDP1 does not Granger Cause HIGDP		1.55834	0.22398

The critical F value is 3.23 (5%level) and 2.44(10% level) (for 2 and 40 df). Therefore we do not reject any of the hypotheses. There fore there is no causation.

Pairwise Granger Causality Tests
Date: 03/04/08 Time: 20:22
Sample: 1960 2004
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
IIGDP1 does not Granger Cause IOGDP1	42	16.0383	9.6E-06
IOGDP1 does not Granger Cause IIGDP1		0.59166	0.55856

The critical F value is 5.18 (1%level), 3.23 (5%level) and 2.44(10% level) (for 2 and 40 df). Therefore we reject the first hypotheses but do not reject the second one. There fore there is one way causality running from investment to openness.

Pairwise Granger Causality Tests
Date: 03/04/08 Time: 20:51
Sample: 1950 2004
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
JIGDP1 does not Granger Cause JOGDP1	52	0.34439	0.71042
JOGDP1 does not Granger Cause JIGDP1		1.99190	0.14779

The critical F value is 3.18 (5%level) and 2.40 (10% level) (for 2 and 50 df). Therefore we do not reject any of the hypotheses. There fore there is no causation.

Pairwise Granger Causality Tests
Date: 03/04/08 Time: 21:20
Sample: 1953 2004
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
SKIGDP does not Granger Cause SKOGDP1	49	3.08610	0.05569
SKOGDP1 does not Granger Cause SKIGDP		0.50608	0.60632

The critical F value is 3.19 (5%level) and 2.42(10% level) (for 2 and 47 df). Therefore we reject the first hypotheses but do not reject the second one. There fore there is one way causality running from investment to openness.

Pairwise Granger Causality Tests
Date: 03/04/08 Time: 21:31
Sample: 1955 2004
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
MIGDP1 does not Granger Cause MOGDP1	46	1.73256	0.18953
MOGDP1 does not Granger Cause MIGDP1		0.61227	0.54700

The critical F value is 3.20 (5%level) and 2.41(10% level)(for 2 and 44 df). Therefore we do not reject any of the hypotheses. There fore there is no causation.

Pairwise Granger Causality Tests
Date: 03/04/08 Time: 21:38
Sample: 1950 2004
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
PIGDP does not Granger Cause POGDP1	52	0.36109	0.69883
POGDP1 does not Granger Cause PIGDP		1.17352	0.31817

The critical F value is 3.18 (5%level) and 2.40 (10% level)(for 2 and 50 df). Therefore we do not reject any of the hypotheses. There fore there is no causation.

Pairwise Granger Causality Tests
Date: 03/04/08 Time: 21:47
Sample: 1960 2004
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
SIGDP1 does not Granger Cause SOGDP1	42	7.19974	0.00229
SOGDP1 does not Granger Cause SIGDP1		1.04761	0.36095

The critical F value is 5.18 (1%level), 3.23 (5%level) and 2.44(10% level) (for 2 and 40 df). Therefore we reject the first hypotheses but do not reject the second one. There fore there is one way causality running from investment to openness.

Pairwise Granger Causality Tests
Date: 03/04/08 Time: 21:55
Sample: 1950 2004
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
TIGDP does not Granger Cause TOGDP1	51	2.58803	0.08608
TOGDP1 does not Granger Cause TIGDP		1.47392	0.23964

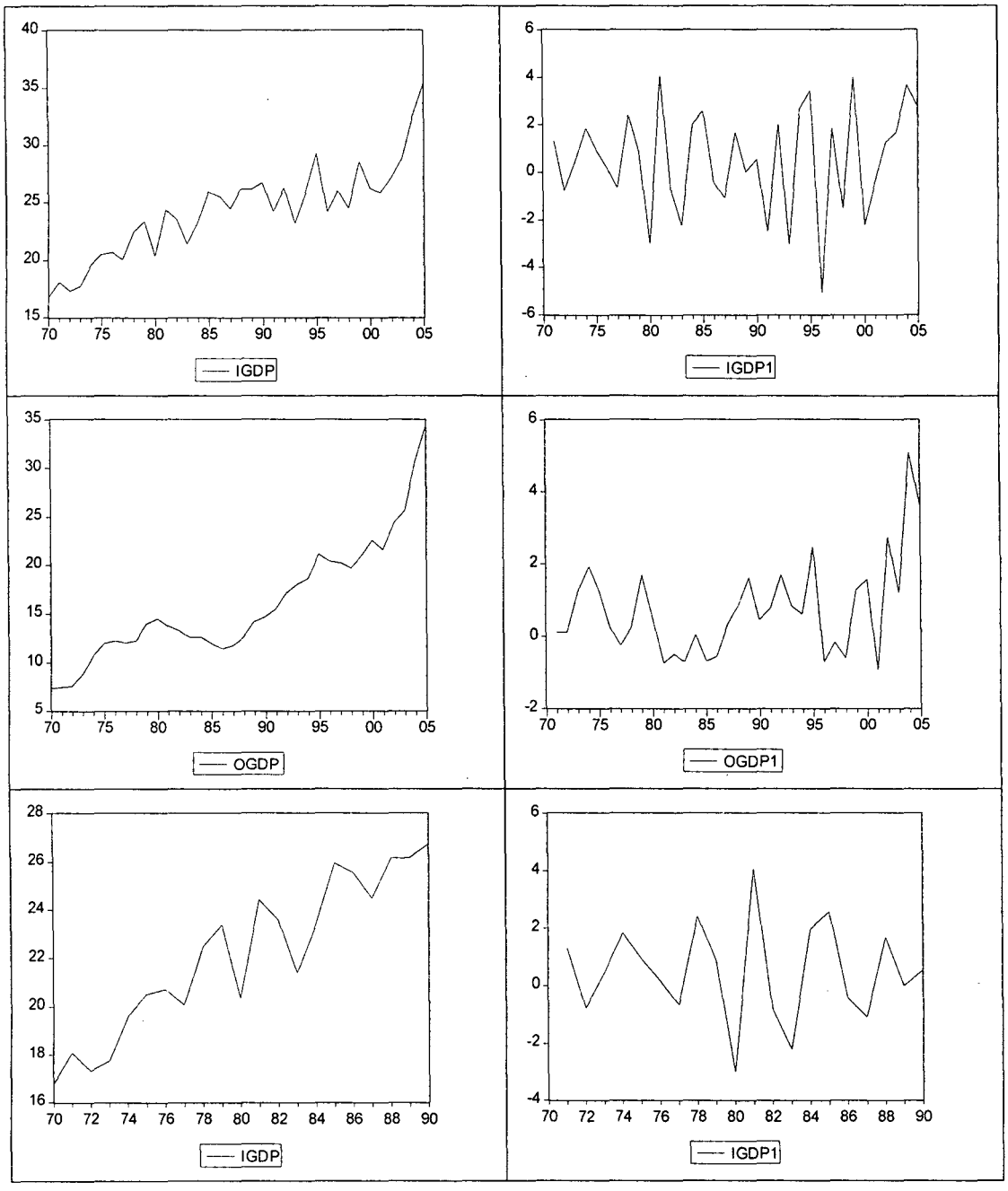
The critical F value is 3.18 (5%level) and 2.40 (10% level)(for 2 and 49 df). Therefore we reject the first hypotheses but do not reject the second one 9at 10% level). There fore there is one way causality running from investment to openness.

Pairwise Granger Causality Tests
Date: 03/04/08 Time: 22:05
Sample: 1950 2004
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
THIGDP1 does not Granger Cause THOGDP1	51	5.99708	0.00485
THOGDP1 does not Granger Cause THIGDP1		1.75689	0.18396

The critical F value is 5.10 (1%level), 3.18 (5%level) and 2.40 (10% level)(for 2 and 49 df). Therefore we reject the first hypotheses but do not reject the second one (at 10% level). There fore there is one way causality running from investment to openness.

Appendix 4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25
20
15
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IGDP
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-2
-4
-6
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IGDP1
35
30
25
20
15
10
5
70 75 80 85 90 95 00 05
OGDP
6
4
2
0
-2
70 75 80 85 90 95 00 05
OGDP1
28
26
24
22
20
18
16
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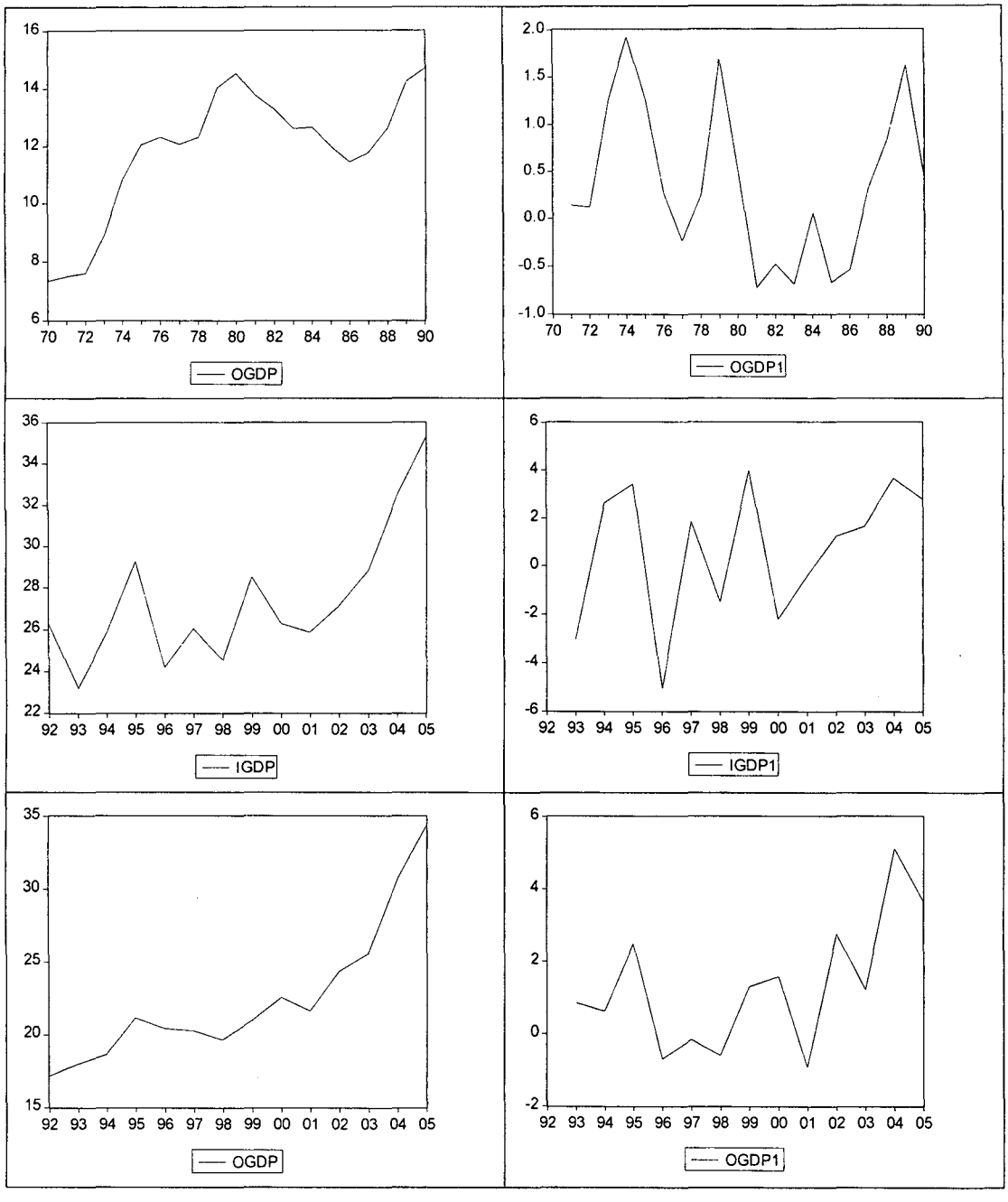
IGDP1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14
12
10
8
6
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1.5
1.0
0.5
0.0
-0.5
-1.0
70 72 74 76 78 80 82 84 86 88 90
OGDP1
36
34
32
30
28
26
24
22
92 93 94 95 96 97 98 99 00 01 02 03 04 05
IGDP
6
4
2
0
-2
-4
-6
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IGDP1
35
30
25
20
15
92 93 94 95 96 97 98 99 00 01 02 03 04 05
OGDP
6
4
2
0
-2
92 93 94 95 96 97 98 99 00 01 02 03 04 05
OGDP1

Appendix 5

Pairwise Granger Causality Tests
Date: 07/09/08 Time: 21:44
Sample: 1970 2005
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
IGDP1 does not Granger Cause OGDP1	33	1.56265	0.22731
OGDP1 does not Granger Cause IGDP1		0.95431	0.39725

The critical F value is 3.31(5% level) (for 2 and 31 df). So we do not reject any of the hypotheses. There is no causality between openness and investment for the entire period from 1970 to 2005.

Pairwise Granger Causality Tests
Date: 07/09/08 Time: 22:39
Sample: 1970 1990
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
OGDP1 does not Granger Cause IGDP1	18	0.77895	0.47917
IGDP1 does not Granger Cause OGDP1		0.59057	0.56821

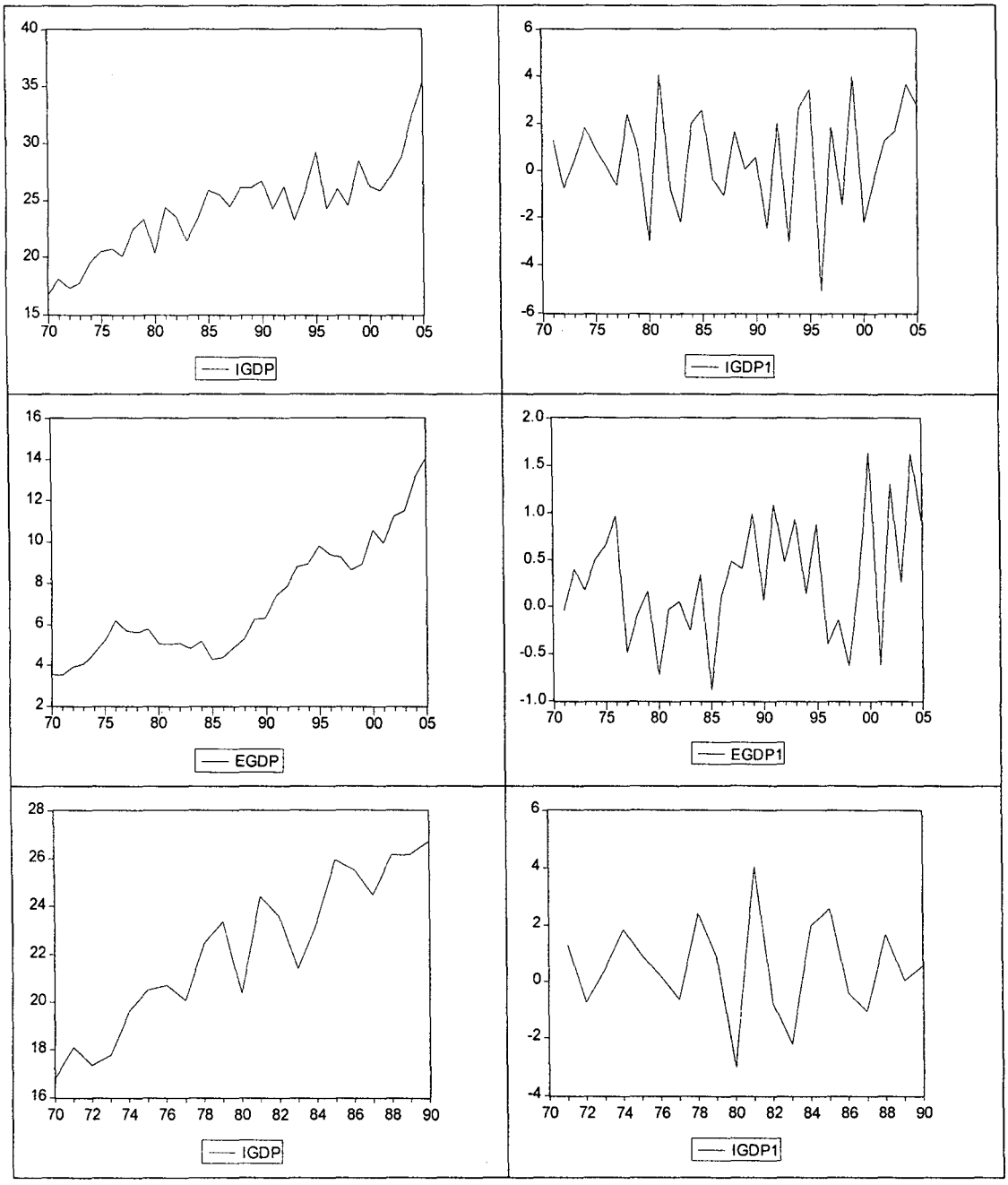
The critical F value is 3.63(5% level) (for 2 and 16 df). So we do not reject any of the hypotheses. There is no causality between openness and investment for the pre liberalisation period before liberalization from 1970 to 1990.

Pairwise Granger Causality Tests
Date: 07/09/08 Time: 22:49
Sample: 1992 2005
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
OGDP1 does not Granger Cause IGDP1	11	0.64204	0.55889
IGDP1 does not Granger Cause OGDP1		1.60607	0.27629

The critical F value is 4.26(5% level) (for 2 and 9 df). So we do not reject any of the hypotheses. There is no causality between openness and investment for the post liberalisation period from 1992 to 2005.

Appendix 6


40
35
30
25
20
15
70 75 80 85 90 95 00 05
IGDP
6
4
2
0
-2
-4
-6
70 75 80 85 90 95 00 05
IGDP1
16
14
12
10
8
6
4
2
70 75 80 85 90 95 00 05
EGDP
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
70 75 80 85 90 95 00 05
EGDP1
28
26
24
22
20
18
16
70 72 74 76 78 80 82 84 86 88 90
IGDP
6
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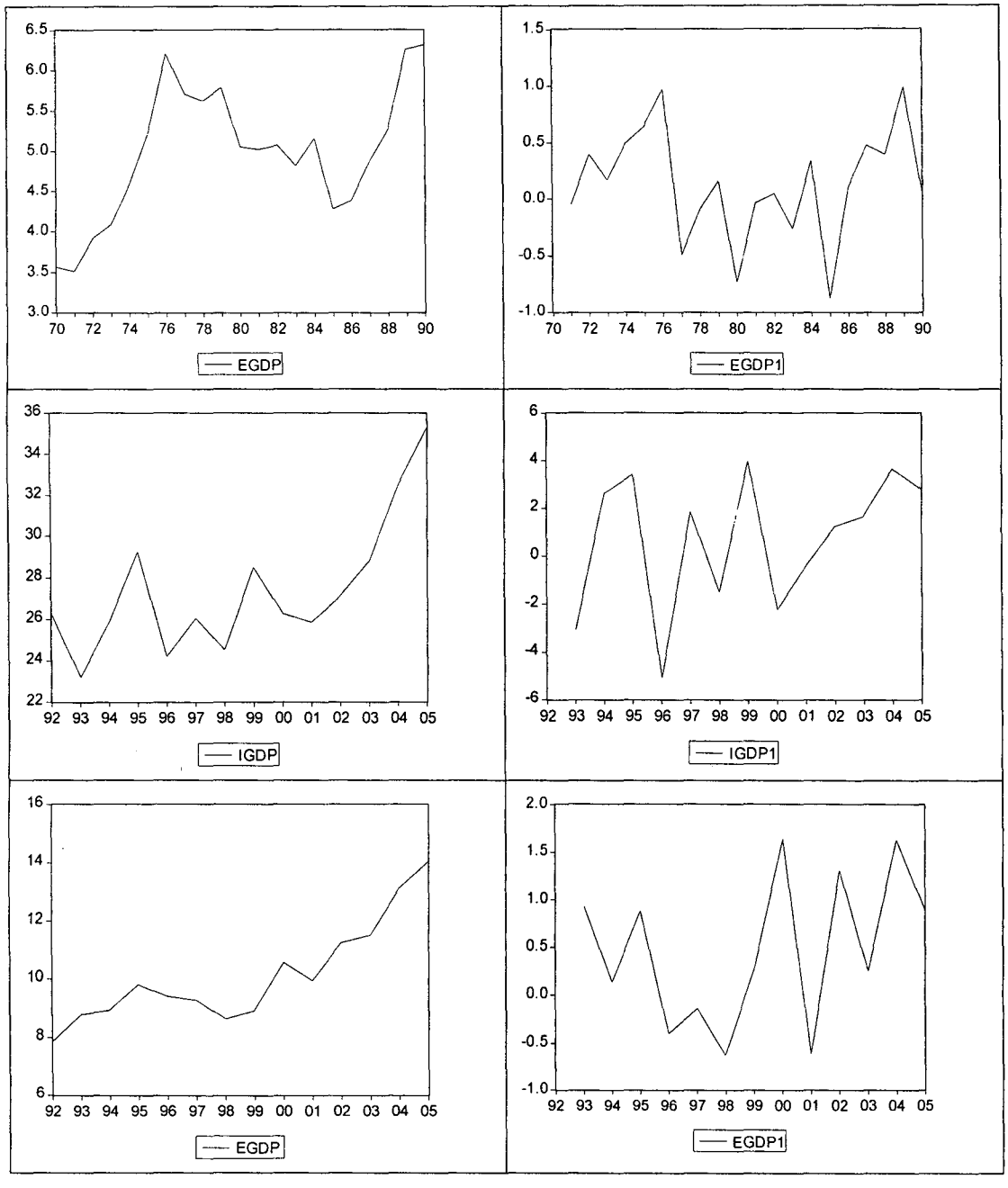
2
0
-2
-4
70 72 74 76 78 80 82 84 86 88 90
IGDP1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70 72 74 76 78 80 82 84 86 88 90
EGDP1
36
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92 93 94 95 96 97 98 99 00 01 02 03 04 05
IGDP
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92 93 94 95 96 97 98 99 00 01 02 03 04 05
IGDP1
16
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92 93 94 95 96 97 98 99 00 01 02 03 04 05
EGDP
2.0
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92 93 94 95 96 97 98 99 00 01 02 03 04 05
EGDP1

Appendix 7

Pairwise Granger Causality Tests
Date: 07/14/08 Time: 18:03
Sample: 1970 2005
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
IGDP1 does not Granger Cause EGDP1	33	2.10775	0.14038
EGDP1 does not Granger Cause IGDP1		0.14755	0.86349

The critical F value is 3.31(5% level) and 2.48 (10% level) (for 2 and 31 df). So we do not reject any of the hypotheses. There is no causality between export and investment for the entire period from 1970 to 2005.

Pairwise Granger Causality Tests
Date: 07/14/08 Time: 18:11
Sample: 1970 1990
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
IGDP1 does not Granger Cause EGDP1	18	0.03768	0.96313
EGDP1 does not Granger Cause IGDP1		1.66814	0.22654

The critical F value is 3.63(5% level) (for 2 and 16 df). So we do not reject any of the hypotheses. There is no causality between export and investment for the pre liberalisation period before liberalization from 1970 to 1990.

Pairwise Granger Causality Tests
Date: 07/14/08 Time: 18:23
Sample: 1992 2005
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
IGDP does not Granger Cause EGDP1	11	2.13433	0.19949
EGDP1 does not Granger Cause IGDP		0.40239	0.68551

The critical F value is 4.26(5% level) (for 2 and 9 df). So we do not reject any of the hypotheses. There is no causality between export and investment for the post liberalisation period from 1992 to 2005.