THE IMPACT OF TRADE POLICY ON GROWTH IN INDIA

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ABSTRACT

The objective of this research is to study the impact of trade policy on growth in India in a time-series framework. This has been done in several steps. In the first step, a time-series index of trade policy was constructed and its relationship with growth was examined. In the second step, the impact of trade policy on exports was examined. In the next step, we investigated the issue of causality between export growth and income growth to see if the export-led-growth hypothesis is valid even for a 'large' country such as India. Finally, the alternative hypothesis of government-led-growth was also tested since the governmental intervention in India was expected to engineer an economic take-off in India. If this latter thesis is rejected by the data, then, by contrast, the earlier thesis of export-led-growth (if accepted) would be rendered even more remarkable.

In carrying out the above steps we have made use of cointegration and error-correction modelling. This is an appropriate methodology to use for our purpose as it helps us to handle non-stationary time series and at the same time preserves the long-run information. More specifically, the Engle-Granger two-step approach, Johansen's Maximum Likelihood procedure and Granger-causality technique have been employed. The time period of our study is 1950-96.

It emerges from this research that liberal trade policy leads to faster economic growth in India. Secondly, the elasticities of exports with respect to the real effective exchange rate and world income are quite large, signifying that world demand conditions were not significant in constraining Indian exports. Further, the available evidence suggests that the export-led-growth thesis is valid even for a 'large' country like India. In this context, what we actually find is that a two-way causality between export growth and output growth. Finally, the evidence presented by us suggests that the expansion of the government sector is detrimental to growth, i.e., the government-led-growth thesis is rejected by the data. An examination of this thesis at a disaggregated level shows that while the expansion of government investment has a negative impact on growth, the impact of growth in government consumption is

insignificant. An interesting finding emerging from our study is that the investment ratio has an insignificant impact on growth in India The impact of trade policy on growth appears to be via higher productivity rather than through higher investment.

The policy conclusion emerging from this study is that export pessimism of the past was misplaced and India would do well to pursue export expansion much more vigorously than hitherto. This would require policies aimed at offsetting the earlier anti-export bias, such as an aggressive exchange rate policy, lowering the degree and dispersion of protection further, de-reservation of (removal of reservation status for) the small-scale sector and liberalisation of the agricultural and consumer goods sectors. This would also require a strategy to tackle infrastructural bottlenecks, which are posing a serious constraint on India's growth and exports.

CONTENTS

CHAPTER 1

INTRODUCTION

In the literature broadly two types of trade strategies have been distinguished: outward orientated and inward orientated. Outward-orientated strategy is broadly one where the system of incentives is neutral between production for exports and production for home market. Inward orientation, on the other hand, favours production for the home market and discriminates against exports.

A number of studies suggest that those countries adopting outward oriented strategies have outperformed those adopting inward oriented strategies. For example, World Bank (1987) has classified 41 developing countries according to their trade orientation and found that trade strategy has a profound impact on economic performance. The performance of outward oriented economies was found to be better in terms of such indicators as GDP growth, saving and investment ratios, capital-output ratios, inflation, export growth, income inequality, agricultural and industrial growth, and total factor productivity growth.

Some studies have used correlation framework, while some others a regression framework, to establish the superiority of outward-oriented strategy. For example, Michaely (1977), Heller and Porter (1978) and Balassa (1978) take export growth as a proxy for outward orientation and find a significant correlation between the export variable and GDP growth. Feder (1983) and Ram (1985) use a production function type of framework and find that export growth has a significant impact on GDP growth. These studies, however, are cross-country studies. More recently, Bahmani-Oskooee and Alse (1993) present time-series evidence suggesting strong support for the export-led-growth thesis.

Why do outward-oriented economies perform better? Krueger (1980) gives three arguments. Firstly, developing countries have a small domestic market and techno-economic requirements of production such as minimum efficient plant size, indivisibilities in the production process, increasing returns to scale and necessity of

competition require outward orientation in trade strategy. Secondly, excesses of import substitution such as extreme currency overvaluation combined with quantitative controls in trade and industrial sector restricted competition and encouraged rent-seeking behaviour. Finally, under export promotion, policy makers get a quick feedback and any policy mistakes can be rectified quickly; therefore under export promotion, policies are closer to optimum and policy makers are constrained in such a way that they do not impede growth.

While outward orientation has recently been claimed to lead to better economic performance, many countries of Latin America and Asia chose an inward-looking strategy of development in the post-war period. India also followed the same strategy. Many countries of Asia, after completing the first easy stage of import substitution, changed over to outward orientation. India along with many Latin American countries continued into deeper and deeper import substitution. The consequences were adverse in terms of economic efficiency and resource use.

Latin America was influenced by the ideas of export pessimism expressed by Raul Prebisch (1950). In his view, adverse market conditions for primary exports would not permit developing countries to attain high rates of economic growth by relying on export production. At the same time these countries could not be expected to compete with developed countries in manufactured exports. Therefore, the only way open to developing countries was to industrialise behind protective walls and follow an inward looking strategy. Similar ideas were expressed by Gunnar Myrdal (1956, 1957) who influenced the policies followed by India. Indian policies were also influenced by the example of centralised planning in USSR.

1.1 Indian Planning Experience

India became independent in 1947. To some extent it was natural for India to adopt inward orientation after independence in view of her colonial experience. Under British rule, Indian economy experienced a prolonged period of stagnation. Whatever development took place was largely lopsided in nature. For example, railways were

primarily built to take raw materials from the hinterland to the ports for export and then transport back imported manufactured goods from ports to the hinterland. Moreover, railways were largely built from imported materials and therefore did not have backward and forward linkages in the economy. While railway building led to development of industries in Britain, it led to dualistic or lop-sided development in India. Further, under the policy of laissez faire pursued by the rulers, sufficient modern industry to compensate for the decline of traditional handicrafts (which declined because of competition from cheap machine-made goods) did not come up. Some authors, in fact talked of 'de-industrialisation' under the British rule. Under these conditions, trade was regarded as exploitative and was seen, by the nationalist opinion, to be benefiting Britain rather than India.

The planning process in India started from 1951. India's development strategy, since the second plan (1956-61) onwards, has come to be known as the Nehru-Mahalanobis strategy. Nehru was the first prime minister of India and was heavily influenced by ideals of Fabian Socialism and the example of centralised planning in Soviet Union. That India under the leadership of Nehru went in for socialist economic policy framework particularly since the mid-fifties had something to do with Nehru's ideological moorings, cannot be denied. Similarly, the two-sector model developed by Prof. Mahalanobis (the author of the second five year plan) accorded primacy to the capital goods sector and closely resembles the work of Fel'dman (1928) in USSR, though the Indian work was done completely independently of Fel'dman's findings.

At the start of the planning process the planners subscribed to the supply-side view of the growth process in which capital accumulation was the key to growth. The key question was how an economy could be transformed from one saving 5 per cent of its income from one saving 20 per cent. In this scheme of things, demand considerations were more or less ignored; the need to motivate investment via adequate growth of demand found no place. Chakravarty (1987) summarises the basic constraints and assumptions at the start of the planning process in India. In his words:

"First, the basic constraint on development was seen as being an acute deficiency of material capital, which prevented the introduction of more productive technologies. Secondly, the limitation on the speed of capital accumulation was seen to lie in the low capacity to save. Thirdly, it was assumed that even if the domestic capacity to save could be raised by means of suitable fiscal and monetary policies, there were structural limitations preventing conversion of savings into productive investment. Fourthly, it was assumed that whereas agriculture was subject to secular diminishing returns, industrialisation would allow surplus labour currently underemployed in agriculture to be more productively employed in industries which operated according increasing returns to scale. A fifth assumption was that if market mechanism were accorded primacy, this would result in excessive consumption by the upper income groups, along with relative underinvestment in sectors essential to the accelerated development of the economy. Sixthly, while unequal distribution of income was considered to be a 'bad thing', a precipitate transformation of the ownership of productive assets was held to be detrimental to the maximisation of production and savings. In other words, there was a tolerance towards income inequality, provided it was not excessive and could be seen to result in higher rate of growth than would be possible otherwise" (pp. 9-10).

Given all these perceptions, it was felt that basic questions relating to how much to save, where to invest and in what forms could be best handled with the help of a plan. Added to the above perceptions was the assumption of low elasticity of export demand which meant that the Indian planners operated on the assumption of a nearly closed economy. In Chakravarty's view, in a closed economy framework if a high savings rate is to be translated into real investment, capital goods need to be produced at home and accorded priority. In his words:

"In such an economy, if savings were to be substantially raised from a low initial level of around 5% in 1950 to 20% in 1975, inter-sectoral consistency over time would demand that the productive capacity of capital goods sector would have to rise at an accelerated rate to convert growing savings into additional real investment. It was therefore the need to raise the real savings rate that led Indian planners to accord

primacy to a faster rate of growth in the capital goods sector, although doubtless there could be other considerations such as building up defence capability" (p.12).

Whatever the reasons for adopting the above strategy, that it kept India in a low growth trap cannot be denied. The performance of the Indian economy bears this out. Analysis of the Indian growth process shows that Indian growth performance was lacklustre till the seventies with the rate of growth hovering around the annual average of 3.7% per annum (1951-79). This growth rate was not enough for the trickle down effect to take place. If population growth is assumed to be 2.3% per annum, this implies a per capita income growth of 1.4% or thereabouts. This was not sufficient to make any significant dent on poverty. When this is contrasted with the per capita income growth rates achieved by the super performers of the Far East, the failure of India's strategy becomes obvious. Not only was the rate of growth slow, it was distorted as it favoured capital intensive industries (in a country where capital was scarce and labour was relatively abundant) and discriminated against labour-intensive exports.

The efficiency of resource use was also poor. This is evident by looking at such indicators as capital output ratios and total factor productivity growth. The capital output ratios were high not only because of high capital intensity of the production process but also because of inefficiency in the use of capital. Total factor productivity performance was also poor. Ahluwalia (1985, 1991), in her study of the Indian manufacturing sector, has found that while in many countries total factor productivity growth contributed significantly to the growth process, in India its contribution was negative or insignificant till the end of the seventies.

While the saving rate jumped from 10% of GDP in 1950 to 22% by the end of seventies, the growth rate of the economy did not show any commensurate increase. Clearly, resource use was highly inefficient as seen by evidence cited above. According to Bhagwati (1993), weak growth performance of the Indian economy reflected a disappointing productivity performance rather than disappointing saving performance. The main features of the policy framework which stifled efficiency and

growth were: (1) extensive bureaucratic controls over production, investment and trade; (2) inward-looking trade and investment policies; (3) a substantial public sector which went well beyond public utilities and infrastructure which it is supposed to provide.

Over the years the government in India seemed to have become 'all pervasive'. Not only did the government intervene directly through investment in infrastructure, irrigation, defence production, fertilisers, iron and steel, and technical education, it also tried to control the flow of private investment in 'desired' directions through import and industrial licensing. The government used its licensing power to decide such things as plant size, location, choice of technology and import content. Overtime, it came to occupy such areas as cars, scooters, bicycles, bread, leather, tourism, hotels and domestic and international trade. While government entry into non-priority areas meant less resources for such things as education and health, the net result of the expansion of bureaucracy to man various controls was the proliferation of rent-seeking activities. Entrepreneurs were rewarded not for excelling in competition in the market place but for their abilities to manipulate licenses! No wonder, then, that the productivity performance of the economy suffered heavily.

It is only during the 1980s that the trend rate of growth picked up to about 5.9% per annum. Industrial as well as export growth also increased. Total factor productivity performance was also much better. This may partly be attributed to the partial liberalisation of the Indian economy during the 1980s. This took the form of more flexible exchange rate policy and liberalisation in the import and industrial licensing provisions. However, the policies of the eighties were unsustainable because they involved large macro economic imbalances. More specifically, there were large fiscal deficits financed by large internal and external borrowings resulting in high inflation and unsustainably large current account deficits throughout the eighties. Soon the internal imbalances manifested themselves in the foreign exchange crisis of 1991 when reserves were barely sufficient to finance half a month's import bill. Many international credit rating agencies downgraded India's credit rating. There was no option but to go to the IMF for loans under the usual 'conditionalities'.

In 1991 India embarked upon a comprehensive set of reforms involving stabilisation and structural adjustment of which trade liberalisation was an important component. Since then many far-reaching reforms have been carried out in India's trade and exchange rate policies. The rupee has been made fully convertible on the current account. India is gradually becoming free from the tyranny of quantitative restrictions on trade and by 1st April, 2001 all remaining quantitative restrictions on imports will be lifted. The peak rate of tariff has been drastically reduced and rationalisation of the tariff structure has been carried out. Rules governing foreign direct and portfolio investments have been liberalised. Apparently, as a result of these policies India has jumped to a higher growth path of 6-7% per annum. The foreign exchange reserves have also considerably improved and on 14th July, 2000 stood at $36.6 billion. However, the task is far from complete. More difficult reforms involving the financial sector, privatisation, labour laws and legal framework for infrastructure are still to be carried out.

1.2 Objectives

Prima facie, it appears that India's growth performance is linked to the kind of trade regime prevailing in India. Up to the end of the seventies, India's trade regime could be described as extremely inward oriented with industrial and trade sectors characterised by quantitative controls. The exchange rate was controlled by the government and was treated as an administered price. The outcome of these policies was a growth rate of 3.7% per annum which hardly had any trickle down impact. In the eighties, some liberalisation in industrial licensing and trade was attempted; and the exchange rate policy was more flexible as compared to the earlier period. All this is reflected in a higher growth rate of the economy which was about 5.9% per annum during the eighties. After the start of the reforms in 1991, which included stabilisation and structural adjustment, the Indian economy has jumped to a higher growth path. If the year 1991-92 is excluded which saw GDP growing by 0.4% due to severe fiscal and monetary compression, the growth rate in the next five years works out to 6.5% per annum during 1992-97. At present the Indian economy is growing at a rate which

lies between 6 to 7% per annum. Clearly, there is a prima facie evidence of a link between trade orientation and growth in India. It becomes important to test this relationship more formally.

The objective of this research, therefore, is to study the impact of trade policy on growth in India in a time-series framework. This will be done in a number of steps so that various links in the chain of trade policy to growth are comprehensively studied. There are at least four reasons for undertaking a time-series study.

Firstly, no study exists which has tried to analyse the relationship between trade policy and growth in India in a comprehensive and systematic manner using a quantitative framework. True, some studies (Bhagwati and Desai, 1970; Bhagwat and Srinivasan, 1975) do document the debilitating impact of industrial and import controls on India's economic performance. Similarly some studies (Panchmukhi, 1978; Goldar and Saleem, 1992) have tried to study the structure of protection in India at one or a few points in time by computing effective rates of protection across various industrial groups. Some studies (Goldar, 1986 and 1986a; Ahluwalia, 1991) have also tried to study the impact of effective rates of protection and import substitution on total factor productivity growth in a cross-section framework. But perhaps no comprehensive study exists which attempts to study the impact of trade policy on growth in India in a time series framework. So one reason for undertaking a time-series study is to fill the gap of a lack of any comprehensive time-series study on India.

Much of the empirical work on the subject of trade policy and growth adopts cross-sectional framework and neglects time-series analysis. One reason for this state of affairs is that it is very difficult to measure or quantify trade policy. Although very elegant definitions of trade orientation have been put forward in the literature such as the concept of bias (Bhagwati, 1978; Krueger, 1978) or effective rate of protection (Balassa, 1965; Johnson (1965); Corden, 1966), yet these concepts are difficult to operationalise in a time-series framework. Because of enormous data requirements great difficulties were faced in constructing Bias or Effective Rates of Protection indices. It is thus clear that some other satisfactory index of trade policy is required

for a time-series study. So the second reason for undertaking a time-series study is to construct an index of trade orientation for India. And perhaps this study constitutes the first such attempt.

The time-series index of outward orientation will be based on the work of Dollar (1992) who constructs a cross-country index of real exchange rate distortion and variability. Dollar's cross-country index is based on price level data made available by Summers and Heston (1988). We shall try to modify his framework for a time-series study of India. It may be noted that the same adaptation can be used for any country for which Summers and Heston price level data are available. However, a comparative study of all the countries is beyond the scope of this research; we shall only confine ourselves to India.

Further, most cross-country econometric work in this area assumes that more outward-oriented economies experience faster growth of exports and then it is tested whether countries experiencing faster growth of exports also experience rapid growth of GDP. A positive answer to the second proposition is then interpreted to mean that outward orientation leads to faster growth. The problem with this approach is that the link between trade policy and exports remains unestablished. We shall, therefore, not use export growth as a proxy for outward orientation; rather we shall attempt to construct an index of trade policy as noted above.

The popularity of the cross-section approach, whether using correlation or regression framework, does not imply that it has been very influential in shaping policy views. It is doubtful whether the recent popularity of trade liberalisation is based on evidence cited by cross-section studies alone. Country-specific analysis, which has provided detailed discussions on the way in which different policies have affected economic performance in a number of countries, has contributed much more to influence policy making. That is the third reason for undertaking a time-series study on India.

Many researchers (Sheehey, 1990; Pritchett, 1996) have noted that superiority of outward orientation must rely on evidence other than cross-country tests. They have

cast doubt on the conclusions of cross-country results because various indicators of trade policy used in these studies have turned out to be uncorrelated. Obviously, time-series studies assume importance and are often more influential in shaping policy views.

Finally, it was often argued that for small countries such as Singapore, Taiwan and Korea outward orientation in trade policy may be justified; but for large countries such as India such an approach may be unsuitable in view of its large internal market. For such countries import substitution was thought to be a more appropriate approach. Although India may be large in terms of population or geographical size, in terms of per capita income it is still small. With a per capita income of $390 in 1997, it cannot be regarded as a large market by any stretch of imagination. In terms of per capita income India emerges as one of the poorest economies of the world and is ranked 102nd out of 133 countries in 1997 by the World Development Report, 1998-99.

Even if it is assumed that India has a large domestic market, this should have favoured India to exploit the economies of scale and not handicapped it. By this token India should have performed better than the far-eastern countries; but nothing of that sort happened as India's growth experience suggests. The point to note is that a country like South Korea, with the world market at its disposal, was able to exploit the economies of scale while India, with only internal market to cater to, could not. Clearly, India's market was not big enough.

According to the World Development Report, 1998-99, India's GNP in 1997 was $373.9 billion and was ranked as 15th largest economy of the world. In terms of purchasing power parity, India's GNP jumps to $1587 billion and it emerges as the fifth largest economy of the world after US, China, Japan and Germany. However, it may be noted that in terms of per capita income, calculated by purchasing power parity method, India is still a poor economy and continues to rank low at 92nd. Therefore, it is clear that in terms of per capita income, whether calculated in the usual way or by purchasing power parity method, India is not a large market.

Even if GNP calculated in terms of purchasing power parity dollars is regarded as the appropriate way of measuring the size of a country's market, the question is: is inward orientation still justified for 'large' economies? It would, therefore, be interesting to see whether outward orientation would lead to higher growth for a 'large' economy such as India.

1.3 Methodology

As noted above the relationship between trade policy and growth will be studied in a number of steps so as to bring out various links in the chain. The first task is to construct a time-series index of trade policy and this will be done on the basis of Dollar (1992), as noted above. The second task is to examine the relationship between outward orientation index and growth in India. In the third step we take up the impact of trade policy on exports. Next, we investigate the issue of causality between export growth and income growth in India to see if the export-led-growth hypothesis is valid even for a large country such as India. Finally, to put the whole thing in perspective, an effort will be made to examine whether the government sector also acts as an engine of growth.

In carrying out the above steps we shall use cointegration and error-correction modelling. More specifically, we shall use the Engle-Granger (1987) two-step approach, Johansen (1988) and Johansen and Juselius (1990) Maximum Likelihood method, the ARDL approach to cointegration (Pesaran and Shin, 1995; Pesaran et al, 1996), and Granger's (1969) causality technique.

Why do we use cointegration and error-correction modelling? Empirical research shows that most economic time series is nonstationary and, therefore, the classical methods such as Ordinary Least Squares become inapplicable. As most economic time series is integrated to the order one, i.e. I(1), first differencing often results in stationarity. But this way of dealing with the problem of nonstationarity is like throwing the baby out with the bath water. Although we may get a nonstationary time

series by first differencing, this is at the cost of long-run information contained in level variables. Ideally, one should have an approach where the short run can be combined with the long run. That is why cointegration and error-correction modelling is an appropriate method to use and is, therefore, popularly applied in time-series analysis. In the error-correction formulation, long-run information is contained in the error-correction term and short-run influences are captured by the lagged differenced terms. Details of the methodological issues are discussed in Chapter 3.

1.4 The Scheme of the Dissertation

The scheme of the dissertation is as follows. In Chapter 2 we shall review the theoretical as well as empirical literature on the subject. In Part I of the chapter we shall emphasise theoretical issues. We shall start with the various arguments put forward to favour import-substitution strategy and then consider the adverse consequences of such a strategy. We shall also touch upon the debate on trade as an 'engine' of growth vs. trade as a 'handmaiden' of growth. Next we shall discuss the recent renewal of interest in trade liberalisation and why outward orientation performs better. Finally, we shall go into the design of trade reform and the political economy issues to be kept in mind while doing it.

Part II of Chapter 2 shall survey the empirical evidence on the subject of trade policy and growth. We shall start with the multi-country studies and then consider econometric studies using correlation and regression framework. We shall then consider the shortcomings of these studies. As we shall note, one major weakness of the econometric studies is that they do not go into the issue of causality between export growth and income growth. We shall then discuss a set of time-series studies which do go into this aspect. Another drawback of econometric studies is that they use export growth as a proxy for outward orientation and their results are not robust to alternative trade policy variables. We shall then discuss the studies using such alternative variables. Finally, we shall take up some studies using subjective indices of trade orientation.

In Chapter 3 we shall take up the methodological issues. As noted above we shall use cointegration and error-correction modelling as this allows us to combine the short run with the long run. As most economic time series is nonstationary we shall start with the question of testing for stationarity. Then we shall briefly review the various approaches to cointegration such as the Engle-Granger two-step method, Johansen's Maximum Likelihood Method and the ARDL approach. We shall also discuss the strengths and weaknesses of these methods. Finally we shall discuss the Granger-causality procedure.

Chapter 4 will examine India's trade and industrial strategy and its consequences. India's strategy of development will be analysed in terms of the main features of India's model of growth since 1951. In the process, we shall dwell on the debilitating impact of India's trade and industrial policies since independence such as Industrial Policy Resolution 1948, Industrial Policy Resolution 1956, Industrial Development and Regulation Act 1951, Monopolies and Restrictive Trade Policies Act 1970, Foreign Exchange Regulation Act 1973, Urban Land Ceiling and Regulation Act 1976 and Industrial Disputes Act 1947. Next, we shall make an assessment of the strategy in terms of such performance indicators as exports, growth, capital-output ratio, total factor productivity growth and poverty eradication. Finally, we shall consider India's trade liberalisation since 1991 and its impact.

An index of outward orientation for India will be constructed in Chapter 5. Then we shall use it to examine its relationship with growth in India. In the process we shall compare our results with that of Dollar (1992) in a cross-country context. We shall adapt Dollar's method for the index for India. His cross-country index of real exchange rate distortion is based on international comparison of prices prepared by Summers and Heston (1988). This index is then used to investigate whether there is an empirical relationship between outward orientation and growth using a sample of 95 developing countries. Essentially, his method consists of correcting Summers and Heston price levels for variation in factor endowments. As non-tradable prices differ widely across countries depending on relative factor endowment, Summers and Heston price levels therefore need to be appropriately corrected. This is done by

regressing relative price levels on endowments. The estimated relationship then gives the international 'norm' and a country's orientation is measured as a deviation from this 'norm'.

In Chapter 6 we shall examine the relationship between various indicators of trade policy, including Dollar's index, on exports. Most studies using export growth as a proxy for outward orientation assume that liberal trade policy leads to faster export growth but they do not prove this. In our study on India, we shall explicitly explore this link. If liberal trade policy does lead to faster export growth in India, then we are justified in concluding that the link between trade policy and growth lies through exports. But as we said this needs to be explicitly examined rather than being simply assumed.

In Chapter 7 we take up the issue of causality between export growth and GDP growth. The earlier econometric work, whether using correlation or regression framework, did not go into this issue. To examine this issue one has to get away from cross-country framework and adopt a time-series approach. In other words, the issue of causality has to be addressed for each country separately. Only then can one pass a judgement on whether a particular case is that of export-led growth or not. Export-led-growth thesis cannot be judged just on the basis of a correlation or regression framework. The issue of causality has to be directly addressed; and for India this is done in Chapter 7.

Chapter 8 goes into the issue of government-led growth. In India the role of the state was all encompassing covering almost all spheres of economic activity. The public sector not only intervened directly through investment, but also indirectly by its regulatory framework to channel private investment in 'desired' directions. All this was done to engineer an economic take-off in India. Did it really happen? Did the government succeed in its aim? Answers to these questions can be found if we address the issue of causality between expansion of the government sector and GDP growth directly. It is also important to take up the issue of government as an engine

of growth because then we shall know which engine works better in India- exports or government.

In Chapter 9 we shall present a summary of our findings and make some concluding observations. We shall also analyse the policy implications for India emerging from our study. We shall also discuss what more needs to be done to make export promotion a success in India.

CHAPTER 2

TRADE POLICY AND GROWTH: A SURVEY OF THE LITERATURE

There is a vast literature on the subject of trade policy and growth. In this chapter we propose to survey this literature, and start by defining trade policy or strategy.

According to the World Development Report 1987, there are broadly two types of trade strategies: outward orientated and inward orientated. Outward orientation is defined in terms neutrality of incentives between production for exports and production for home market. In other words, the policy regime is neutral between earning a unit of foreign exchange through exports and saving it through import substitution. Inward orientation, on the other hand, favours home production and discriminates against exports.

Another way of defining the trade regime would be in terms of the effective exchange rates for exports and imports, as done by Bhagwati (1978) and Kreuger (1978). If the effective exchange rate for exports is greater than the effective exchange rate for imports, it represents the export-promotion regime. If it is the other way round, it represents an import-substitution regime. If the effective exchange rate for exports equals that of imports, it represents a neutral regime. Bhagwati and Krueger define trade liberalisation as a move which reduces the anti-export bias and helps a country to move towards neutrality.

Neutrality in trade regime can be achieved by maintaining high tariffs and then offsetting their effect through export subsidies. Therefore, a neutral regime is consistent with an illiberal policy. In order to avoid this, the concept of liberalisation can be redefined more sharply where all distortions including tariffs and subsidies are reduced. Papageorgiou et al (1991) define trade liberalisation as any act which would

make a trade regime more neutral and nearer to a system free of government intervention. This concept embraces two notions: greater neutrality and freer trade.

This chapter is divided into two parts. In the first part, we examine critically the theoretical arguments and issues concerning each type of trade strategy: import substitution and export promotion. In the second part, we take up the empirical literature on the subject.

Part I: Trade Policy and Growth: Theoretical Issues

2.I.1 Import Substitution Under Protection

Although classical and neo-classical economists talked of the virtues of free trade, the idea of liberal trade has not been very popular during most of the twentieth century. After the Second World War, it was fashionable for newly independent economies to adopt inward orientated strategies and to industrialise behind high tariff walls. In doing so they were not only influenced by their colonial past but also the prevailing economic view which favoured an import substitution model of development rather than an export promotion model. Many arguments were put forward in support of import substitution behind protectionist walls.

2.I.1(a) The Singer-Prebisch Hypothesis:

Protectionist policies were influenced by the ideas of export pessimism expressed by Raul Prebisch (1950) and H. W. Singer (1950). It was argued that while primary exports of developing countries faced adverse market conditions and deterioration of their terms of trade, these countries could not rely on manufactured exports for growth because of a lack of competitiveness. Therefore, the only alternative for these countries was to produce for the home market behind high tariff walls. Prebisch was highly influential in Latin America and as Secretary General of the UN Economic Commission for Latin America (ECLA) he was instrumental in moulding the thinking of these countries.

The Prebisch-Singer hypothesis of secular decline in terms of trade of the primary producers is based on the analysis of the British terms of trade made by Prebisch for the years 1873-1938. Singer gave the theoretical underpinnings to the argument. First, as per capita income in advanced countries increases, operation of Engel's law would ensure that proportionately less is spent on primary goods as these goods have an income elasticity of less than one. Secondly, developed countries, due to technological advances, have developed substitutes for primary commodities in the form of synthetics. This ensures that demand for primary goods may not increase at a fast rate, while manufactured goods produced by developed countries will have a price advantage as they are produced by multinationals who have the monopolistic power to set prices. The net result would, therefore, be a deterioration in the terms of trade of primary goods producing countries.

Prebisch's empiricism has been questioned on a number of grounds. Firstly, the analysis is based on the UK's terms of trade and does not take into account those of developing countries. If the UK's terms of trade have improved, it does not necessarily mean that those of developing countries have declined. Secondly, a substantial part of the UK's imports came from New Zealand and Australia which are not developing countries. Finally, issues like improvement in the quality of manufactures or fall in the prices of the UK's imports due to decline in shipping costs have been ignored. However, Singer (1989) has pointed out that subsequent analysis by Spraos (1980,1983) "has shown that correction for shipping costs and changing quality would not destroy the empirical basis for the hypothesis" (p. 324).

Recent evidence by Grilli and Yang (1988) shows that from 1900 to 1986 relative prices of all primary commodities fell by 36% or 0.5% per annum. Non-fuel primary commodities during the same period fell by 40% or 0.6% per annum. Grilli and Yang thus confirm that terms of trade for the primary commodity producers have fallen but, perhaps, not by as much as is implicit in the work of Prebisch.

Sapsford and Balasubramanyam (1994), after reviewing the recent statistical evidence on terms of trade and also after noting the statistical refinements in analysing the terms of trade from the days of Prebisch, come to the conclusion that the balance of evidence supports the hypothesis and "there can be few hypotheses in economics that have stood the tests of both time, and new statistical techniques, so well" (p. 1743). Although the magnitude of the estimates of the decline in the terms of trade varies from 0.7% to 1.3% (or higher) per annum, the phenomenon is real especially for those countries which depend heavily on primary exports as a source of foreign exchange.

Even if the terms of trade of primary producers have declined, it does not warrant the conclusion that developing countries cannot diversify and expand their manufactured exports. As the experience of south-east Asian countries shows, it is possible to grow through export expansion. Here it may be pointed out that diversification need not necessarily be into capital and technology intensive manufactures; it could be into processing of primary exports.

2.I.1(b) Infant Industry Argument for Protection:

This argument, the oldest existing argument for protection, was put forward by a German economist Fredrich List in the context of German industry which could not compete with the more established British industry and therefore needed protection to 'grow up'. It was argued that free trade may have been good for Britain whose position as the leading industrial power was well established. But for the young and emerging German industry protection was required. The infant industry argument soon came to be accepted more widely and others, particularly J. S. Mill, recognised its importance.

The crux of the argument is that a small firm may be unable to reap the economies of scale and, therefore, requires tariff protection to do so. Once the firm has grown up free trade can be allowed by dismantling the tariff. The firm then is expected to face international competition. Therefore, the argument is for short-term protection so that

in the long run the country protecting its infant industry can have a higher level of welfare.

In the short run, however, protection implies loss of consumer welfare as the consumer has to pay a higher price. It also involves a production cost in the form of loss of producer surplus. Therefore, for the infant industry argument to be justified, it is essential that the infant industry should pass two tests, the Mill test and the Bastable test (Sodersten, 1980). Under the Mill test the requirement is that infants should eventually be able to grow up and compete at world market prices. Under the Bastable test, not only should the infant be able to face international competition it should also be in a position to pay back the losses due to protection during infant industry period.

A close look at the above argument shows that the argument is not as convincing as it may first appear. It may be argued that existence of economies of scale may itself not be sufficient to protect an industry. If a well-developed capital market exists then the investment will be undertaken even without protection. If the capital market does not function properly, as may be the case in developing countries, infant protection may be justified. Even in this case it may be argued that it is better to deal with the capital market imperfection directly rather than protecting industries.

At the heart of arguments about infant industry protection lies the existence of external economies or external spillover effects which the firm may not be in a position to capture. For example, a firm may find it unprofitable to educate or train people who always have the option to leave this firm and join some other. In such a case, the investing firm is not able to appropriate or internalise the benefits of educating and training its workforce which may spillover to rest of the economy. Clearly, social benefit exceeds private benefit. Therefore, the state can step in to subsidise such investments. Here it may be noted that, from the point of view of efficient allocation of resources, it may be preferable to give a subsidy to industries having external spillover effects than protecting them through tariffs.

The infant industry argument is essentially dynamic. It is an argument for short-term protection till a country's real pattern of comparative advantage emerges. Therefore, the argument can be used for protecting only those industries in which a developing country is likely to have comparative advantage in the long run and not for protecting all industries. In practice many developing countries have used tariffs to implement their policies of import substitution where protection was provided indiscriminately and indefinitely. Many countries of Latin America and Asia are such examples.

Corden (1987) has pointed out an important qualification to the use of tariffs or quotas for infant industry protection. If an infant is to be protected or rather "promoted" then it should not just be oriented towards producing for the home market but also for exports. Most developing countries have very small home markets and, therefore, should eventually aim for world markets even if they initially produce for the home market. Assistance provided to these industries by governments should not discriminate between home and foreign markets and should take the form of subsidised infrastructure or expenditure on education to build up suitable workforce rather than tariffs or quotas.

2.I.1(c) Other Arguments

The case for import substitution under protection has also been made by putting forward a number of arguments against trade. The idea that free trade will benefit developing countries has been criticised in the literature. Neo-classical theory tells us that each country can gain from trade if it produces in line with its comparative advantage. This theory has been criticised on the grounds that it is a static theory and cannot be used to describe the dynamic process of growth which developing countries are trying to pursue. It can be argued that dynamic comparative advantage keeps on changing over time and a country can consciously strive to change its dynamic comparative advantage overtime.

Another criticism of the neo-classical trade theory is directed against the factor price equalisation theorem. According to this theorem, free trade is a substitute for factor

mobility and tends to equalise not only prices of products but also factors. Critics have, however, pointed out that in reality international distribution of income has become more unequal. Gunnar Myrdal (1956) has argued that "if left to its own course, economic development is a process of circular and cumulative causation which tends to award its favours to those who are already well endowed and even to thwart the effort of those who happen to live in regions that are lagging behind" (Meier, 1989; p. 385). Further, "on the international as on the national level trade does not by itself necessarily work for equality. A widening of markets strengthens often on the first hand the progressive countries whose manufacturing industries have the lead and already fortified in surroundings of external economies, while the underdeveloped countries are in a continuous danger of seeing even what they have of industry and, in particular, their small scale industry and handicrafts outcompeted by cheap imports from industrial countries, if they do not protect them" (p. 385).

International trade does promote exports of primary products from developing countries but here the countries face adverse demand conditions in the form of inelastic demand. Any technological improvement leading to reduction in price of primary goods benefits the importing countries. Therefore "forces in the markets will in a cumulative way tend to cause even greater international inequalities between countries as to their level of economic development and average national income per capita" (p. 385).

Meier (1989) notes that it is inappropriate to read too much into the factor price equalisation theorem as it is based on highly restrictive assumptions. These assumptions are identical production functions in all countries, constant returns to scale in the production of each commodity, and perfectly competitive product and factor markets. In reality these assumptions are likely to be violated and, therefore, it is no surprise that factor returns have not equalised between rich and poor countries. The criticism against the theorem seems, therefore, to be highly overdrawn. The essence of the neo-classical trade theory that real income of a country will be higher with trade than without may then still hold.

At this stage it may be useful to consider whether freer trade leads to worsening of income distribution. Edwards (1997), after analysing several trade policy indices and inequality measures for 44 countries, finds that there is no evidence linking openness or trade liberalisation to increase in inequality. On the contrary, countries with more distorted trade regimes have had more unequal distribution of income.

Another argument against trade is that it has led to dualistic development in developing countries. In the initial stages of their development foreign capital was attracted in export sector which was profitable to the investing country but inhibited development in poor countries by retarding domestic investment or supply of domestic entrepreneurs. The argument however does not look very convincing. As Myint (1958) notes that the real choice was not between employing the resources in export sector or domestic production, but between giving employment to surplus resources in export production or leaving them idle.

Some critics have also argued that international trade inhibited saving in underdeveloped countries through the so called "international demonstration effect." When the poor countries come in contact with high consumption levels of advanced countries, they try to imitate them with the result that consumption levels in poor countries rise leaving little for investment. It is, however, equally plausible to argue, as Myint (1964) has done, that the international demonstration effect may have increased the supply of effort in these countries by offering them incentive consumer goods.

2.I.2 Stages of Import Substitution and Consequences of the Strategy

Bela Balassa (1980,1989) has described the various stages of import substitution under protection. The first stage is 'easy' as the production process along with the required technology are simple. The second stage is 'difficult' as the production gets more complex and makes tall demands on the availability of technical skills and technology. Import substitution can even occur fairly early on in a country without protection for those goods where transportation costs are high. Such industries enjoy

natural protection because of high transportation costs and may consist of necessities and conveniences of life as well as education. The process of import substitution can be speeded up if natural protection is accompanied by tariff or quota protection.

The first stage of import substitution has been described as an easy stage and does not require high protection. During this stage import of non-durable consumer goods such as clothing, shoes and household goods and their inputs such as textile fabrics, leather and wood is replaced by domestic production. Production of such commodities is easy because these commodities are intensive in unskilled labour. The efficient scale of output is low and costs do not rise substantially at lower levels of output. Further, production does not involve the use of sophisticated technology and a network of suppliers of parts, components and accessories is not required for efficient operations. To the extent that domestic production of such commodities leads to diffusion of technology, labour training and entrepreneurship development, there is a case for moderate degree of infant protection for these industries.

In the second stage, the process of import substitution becomes much more difficult and is like "travelling up the staircase". For the industries to develop high rates of protection are required. During this stage, imports of intermediate goods and consumer and producer durables are replaced by domestic production. The production of such goods is highly capital intensive and is subject to economies of scale. Production also requires high degree of skills and sophisticated technology which may be beyond the capability of developing countries. Therefore, those developing countries which embark on this stage may find themselves increasingly out of tune with their comparative advantage with domestic resource cost (DRC) ratios for these products being very high.

In the post-war period several countries of Latin America and South Asia adopted second-stage import substitution under the influence of export-pessimism philosophies touted at that time. Second-stage import substitution was not a suitable policy for these countries as the production process got more and more out of tune with the dictates of comparative advantage. As already noted, the production process makes

tall demands on skills and technology. Balassa (1980) has highlighted the adverse effects resulting from second-stage import substitution.

To begin with, while the infant industry argument calls for temporary protection until industries become internationally competitive, in the above countries protection was regarded as permanent. There was a tendency to indulge in import substitution at any cost. Moreover, uncritical acceptance of the demands of protection led to considerable variations in explicit and implicit rates of protection. In the absence of international price comparisons, the protective effect of quantitative restrictions could not even be established. The neglect of intra-industry relationships further increased the dispersion of protection rates or effective rates of protection with adverse effects on economic efficiency.

Countries applying inward-orientated strategies were further characterised by the existence of sellers' markets. Sellers' market may be described as a situation dominated by one or at best a few sellers and shortage of goods. Because goods are in short supply any shoddily produced and high priced products get sold. In terms of quality, price or variety consumers have little choice. There is lack of competition in the market. While import competition was eliminated by protection, the possibility of domestic competition was limited by small domestic markets. The existence of sellers' market provides little incentive to improve quality and productivity or cut costs. The result was a high-cost industrial structure.

Another feature of inward orientation practised in these countries was financial repression. This led to negative real interest rates which adversely affected domestic savings, encouraged self investment including inventory accumulation at low returns, and encouraged the transfer of funds abroad. Negative interest rates also necessitated credit rationing that generally favoured import substituting investments in the private as well as public sector. Moreover, underpricing of capital led to its more extravagant use and encouraged capital-intensive techniques of production.

There was also a tendency to underprice utilities in these countries. This may be because of low interest rates or as a consequence of conscious decision. The underpricing of utilities benefited particularly energy-intensive industries. The result was that these countries ended up using their scarce resources more extravagantly, whereas the proper thing would have been to use scarce resources more productively.

The countries following second-stage import substitution tended to rely on quantitative instruments such as industrial and import licensing, quotas and exchange controls. In the process they de-emphasised the role of prices with the result that output and input prices became distorted. This led to misallocation of resources which could have been avoided had these countries confined themselves to the use of more transparent instruments such as tariffs.

The policies of import substitution discriminated against exports as well as agriculture sector in these countries. Effective rates of protection for these countries show that while domestic industries enjoyed high effective protection, exports and agriculture were given negative effective protection. The discrimination against exports did not permit the development of manufactured exports. Primary exports also suffered on account of low prices which discouraged production and encouraged their domestic consumption. The result was that little exportable surplus was left. Further, turning the internal terms of trade against agriculture and other primary activities led to decline in export-market shares.

The slowdown of primary exports and lack of manufactured exports led to foreign exchange shortages. The foreign exchange constraint became increasingly binding and did not permit rapid growth. When attempts were made to speed up growth beyond what was permitted by foreign exchange availability, this resulted in foreign exchange crises.

These economies also ran into saving shortage because of the high capital requirements of capital-intensive production, on the one hand, and income loss due to

protection on the other. Negative real interest rates contributed to capital flight aggravating the saving constraint further.

In several developing countries, the cost of protection has been estimated and turns out to be a significant proportion of GNP. At the same time evidence also suggests that total factor productivity growth, which measures technical progress, was lower in countries engaged in second-stage import substitution than in industrial countries. Thus, Balassa (1980) reaches the conclusion that "rather than reducing the economic distance vis-à-vis the industrial countries that infant industry protection was supposed to promote, ...there was a tendency for this lag to increase over time" (Meier, 1989; p. 399).

The above analysis seems to suggest that it is not import substitution per se which leads to lower growth and inefficiency in the use of resources. Rather the above adverse effects result only if the process is carried too far into the second stage. It is important to note that no country, with the exception of UK and Hong Kong, has industrialised without protecting its industries. While first-stage import substitution may be justified on infant industry grounds, it is hard to justify the inefficient second stage which takes a country further and further away from its true comparative advantage, whether static or dynamic. After all a country cannot be expected to move directly from export of primary commodities to export of manufactures. The first-stage import substitution can be viewed as a stage lying between export of primary goods and export of manufactures. The experience of South Korea, Taiwan and Singapore confirms that these countries initially followed first stage import substitution and then switched tracks to export promotion. In doing so they were able to avoid the inefficient second stage.

2.I.3 Trade as an Engine of Growth

After having established the adverse consequences of import substitution especially when it is carried too far into the second stage, we now turn to the theme of trade as an engine of growth. The idea that trade acts as an engine of growth can be traced

back to classical economists starting with Adam Smith. Before the advent of classical economists mercantilist school of thought advocated intervention in foreign trade sector to earn an export surplus. This could be done by encouraging exports and limiting imports. The classical economists, on the other hand, advocated free trade as trade leads to gains in static as well as dynamic terms. The idea of trade as an engine of growth is based on three arguments (Meier, 1989): vent for surplus argument, comparative cost argument and dynamic gains from trade.

The "vent for surplus" idea attributed to Adam Smith postulates the existence of surplus capacity in the form of land and labour before an economy is opened up to international trade. Trade opens up the possibility of utilising this surplus capacity to produce for exports. Trade, therefore, gives vent to this surplus capacity which otherwise would have remained unused. Since resources are unemployed before trade, trade leads to increase in production as well as consumption of a society. The country through utilisation of surplus capacity starts producing on the production possibility frontier (from a point inside it) and through trade moves to a point outside the frontier.

Subsequent classical economists like Ricardo considered the gains from trade arising from specialisation in accordance with comparative advantage. Gains from trade arose from more efficient allocation of resources rather than by the use of surplus resources. This, however, is a static argument which enables a country specialising in accordance with its comparative advantage to gain from better utilisation of existing resources. It says nothing about how the production possibility frontier can itself be shifted outwards.

Trade, therefore, not only has static but also dynamic effects. The dynamic or growth-producing effects of trade are termed as indirect effects of trade. Mill talked of these effects which are of three types: (1) those that widen the extent of the market, induce innovations and increase productivity; (2) those that increase saving and capital accumulation; and (3) those that have educative effect in instilling new wants and tastes and in transferring technology, skills and entrepreneurship.

Nurkse (1962) has propounded the view that trade was an engine of growth in the nineteenth century because the center (i.e., UK) vigorously transmitted its growth to the outlying areas of the world through its increasing demand for food and raw materials. However, the twentieth century was different as the world trade slowed down considerably during the first half. The quantum of world trade during 1928-58 grew by 57% in comparison to 270% during 1850-80 and 170% during 1880-1913. This "export lag" led him to advocate balanced growth for developing countries as trade option had become unavailable. This also implied inward oriented import substitution policies for developing countries. Nurkse did not oppose the principle that trade could act as an engine of growth but, due to unfavourable external conditions, he was pessimistic about its availability to the developing countries in the twentieth century.

Kravis (1970) has argued that evidence does not support the view that trade played a dominant role in the success stories of the nineteenth century although it was one of the factors. A more appropriate expression would, therefore, be to describe trade as a 'handmaiden' of successful growth rather than an autonomous 'engine' of growth. In his view growth, where it occurred, was mainly due to favourable internal factors and external demand represented an added stimulus which varied in importance from country to country and period to period. Moreover, evidence did not provide any basis for the view that external demand conditions for today's developing countries were less favourable than they were in the earlier century. Trade could still play as a handmaiden role in the growth of today's developing countries as it did for the periphery countries in the earlier century.

According to Kravis, trade is one among many factors affecting growth and it is unlikely to be the dominant factor in many instances. The US, which was the greatest success story of the nineteenth century, owed its development mainly to internal factors. While some other countries like India and Ceylon did not experience fast growth despite the fact that trade expanded as fast for them as in the case of US. Thus "exaggeration of the past role of trade has often served to heighten the contrast drawn

with allegedly less favourable present day world markets and thus to minimise the potential role of trade for today's developing countries. The term 'engine of growth' is not generally descriptive and involves expectations which cannot be fulfilled by trade alone; the term 'handmaiden of growth' better conveys the notion of the role trade can play" (p. 869). The implication is that developing countries should not attribute their export difficulties to unfavourable external demand; rather they should look to the more important problems at home. Those countries which have shared more fully in the expansion of world trade have done so not on the basis of favourable markets for their traditional exports but on the basis of their efforts to raise export shares and diversify their exports. A good export performance results from internal factors affecting mobility of resources rather than from favourable external demand.

2.I.4 Trade Liberalisation

We have seen that the idea of trade as an engine of growth goes as far back as Adam Smith but for most of the present century the idea has not been very popular. After the Second World War most developing countries chose inward orientation. In doing so they were not only influenced by their colonial past but also the prevailing economic view which favoured import-substitution policies. However in the 1980s the pendulum began to swing in the opposite direction towards freer trade. The developing countries began to realise the destructiveness of protectionist policies and the sacrifices it involves in terms of growth and efficiency in the allocation of resources. Therefore, they began to adopt trade liberalisation. The debt crisis as well as collapse of communism contributed further to the process of trade liberalisation.

Dornbusch (1992) gives four reasons for the new enthusiasm for freer trade: anti-statism, poor economic performance inward oriented countries, better information and World Bank pressure. These are discussed below:

(a) The world has seen a broad intellectual swing away from emphasising the beneficial role of state in the 1980s, and protectionism is seen as one of the manifestations of an overly intrusive state. State intervention was earlier justified on

the grounds of market failure. Economists now began to talk of government failure in the light of the experience gained in the earlier decades.

(b) Many developing countries, which adopted import-substituting-industrialisation strategies, ended up with a dismal economic performance. These countries often resorted to populist macroeconomic policies which led to debt crises and hyperinflation. An adverse external environment also added to the woes of these countries. Since plentiful credit is no longer available to these countries, attention now has shifted to productivity gains and the use of trade opportunities to achieve this.

(c) Because of better access to information about the outside world, consumers have become conscious of the quality and price of goods available outside. Similarly, the firms know what technology and inputs their competitors elsewhere are using and, therefore, demand the same access.

(d) Major research projects under the World Bank and NBER, have documented the ill effects of inward orientation and lessons learnt from successful export promotion strategies. As a result of this, trade vs. protection perspective gave way to the importance of adopting more neutral trade regimes. Successful performance of outward-orientated economies encouraged World Bank to make trade liberalisation a condition for lending.

Trade has forward and backward linkages with rest of the economy and if properly utilised can give a powerful stimulus to growth impulses in the economy. Whether these linkages are utilised or not depends on the nature of the commodity produced and nature of a country's policies. If export sector producing a particular commodity is well integrated with rest of the economy and does not merely remain an enclave, then it will exercise the intended effect on growth. Similarly, if policies of a country are appropriate and enable it to make use of its trade opportunities, again trade will exert the intended beneficial effect.

There are many channels through which trade liberalisation may positively influence growth. One such channel may be technical progress or the total factor productivity growth. Dornbusch (1992) notes that although systematic attempts at quantification fail to single out trade policy as a major factor in economic growth, growth

accounting has not come up with a satisfactory explanation for the residual which may be as much as 30 to 50 percent of growth. The other channels through which trade liberalisation could bring benefits are broadly these: improved resource allocation in the static sense; access to better inputs and intermediate goods; an economy better able to take advantage of economies of scale and scope; greater domestic competition; availability of favourable growth externalities like the transfer of knowhow; and a shakeup of industry that may create a Schumpeterian environment especially conducive to growth.

Krueger (1980) finds that countries adopting export-oriented trade strategy have outperformed those adopting inward-oriented strategy. As an explanation for the superiority of outward orientation three hypothesis are examined each of which contains some element of validity. The three hypotheses are summarised below.

Firstly, the techno-economic requirements such as minimum efficient size of plant, increasing returns to scale, indivisibilities in the production process and necessity of competition require outward orientation. Failure to exploit these phenomena through trade may significantly impair growth. Export promotion permits entrepreneurs to base their plans on whatever size of plant seems more appropriate; domestic market is not a binding constraint. Due to greater competition under export promotion, monopoly power is less likely to arise. Export promotion may also be more efficient in permitting rapid expansion of profitable activities; under import substitution inefficient firms and sectors expand approximately as rapidly as efficient ones. Finally outward orientation permits more use of labour which is abundant in most developing countries.

The second hypothesis states that differences in growth rates have resulted, not from the choice of strategy per se, but rather from the excesses in the ways in which import substitution strategies were administered. For example, extreme currency overvaluation combined with quantitative restrictions provided the equivalent of prohibitive tariff protection. Techniques of allocating import licenses were such that they prevented competition among domestic firms and rewarded entrepreneurs for

their licence-getting abilities rather than their cost-minimising performance. Excessive and detailed quantitative controls were employed over many aspects of economic activity and this in turn encouraged rent seeking.

The third hypothesis is that policies adopted under export promotion are closer to an optimum and the role of trade policy is to constrain the policy makers in such a way that they do not impede growth. According to this explanation, there need not be a bias for exports; a neutral regime would do. Even if there is a conscious bias in favour of export promotion, it is better than import substitution as the policy would be less distortive. Policy makers receive the feedback of their policies quickly and can take corrective action when required. It is argued that incentives cannot be as biased towards export promotion as they can be under import substitution. This is so because to do so would require export subsidisation which would immediately manifest itself in the form of a drain on the budget. Also, if the exchange rate is out of tune with the market the result would become apparent in the form of an imbalance on the current account. Moreover, if the exporters are expected to compete in the international market they have to be provided ready access to imported capital goods, intermediate goods and raw materials. This would in turn call for a fairly liberal and efficient trade regime.

2.I.5 New Export Pessimism

Many East Asian countries have demonstrated that it is possible to grow on the basis of manufactured exports. However, many critics like Cline (1982) have expressed doubts whether the East Asian model of development can be generalised. Export expansion may have worked for these countries but it cannot be replicated elsewhere as these countries were successful because of favourable initial conditions. Some have invoked the fallacy of composition argument to assert that if other developing countries also reach high exports to GDP ratios the world market would be saturated and their terms of trade may deteriorate. More recently, Lutz and Singer (1990) have argued that the so called Washington consensus, advocating outward orientation as an engine of growth, is based on two assumptions namely small country and fallacy of

composition. The evidence presented by them suggests that there is a sizeable group of countries for which the assumption of exogenous traded goods prices can be rejected. The implication is that terms of trade considerations should be included in trade liberalisation policies and this should make the advocates of trade liberalisation at any price a little more cautious. The terms of trade effects may rise considerably if several countries liberalise simultaneously.

It can be argued that it would be unreasonable to expect that all countries would export at the same time, at the same rate and with the same range of exports. Empirical studies (see Balassa, 1983) suggest that intraindustry trade through horizontal specialisation has increased and the extent of such trade conducted by industrialised countries has grown much more rapidly with developing countries than with other industrialised countries. Moreover, the ever-changing structure of comparative costs allows a country to proceed up the sophistication ladder of manufactured exports; as a country moves up this ladder another country is waiting in the queue to take its place. Further, critics may be emphasising too much on the external demand conditions; whereas the reality may be that it is the domestic factors like the ability to compete in world markets which may be at the root of successful export performance (Kravis, 1970; Riedel,1984; Love, 1984). Lastly, there is a large scope for intra-LDC trade as the trade within the developing countries accounts for a small proportion of their total trade.

2.I.6 Design of Trade Reform

The transition from inward orientation to outward orientation involves costs as some activities become more profitable and others less so. The industries whose profitability is threatened may resist the change and may employ political means to obstruct the process. Moreover the workers who are threatened by the new changes may step up their militancy making it difficult for the decision makers to implement reforms. The problem of transition makes the design of policy reform important.

World Development Report (1987) has listed three types of trade-reform measures: replacing quantitative restrictions with tariffs, reforming tariffs and direct promotion of exports.

(a) A move from non-tariff barriers to tariffs is commonly accepted as a move towards more open trading system. Tariffs are more transparent than quantitative restrictions because they are price instruments and therefore changes in foreign prices feed in more readily to the domestic economy. Thus a move from quotas to tariffs can be regarded as a first step of trade policy reform.

(b) The movement towards greater neutrality of trade regime involves first, lowering the average level of protection and second, reducing the dispersion or variance of protection. It is possible that reform may reduce average protection but may not make the tariff structure more neutral. For example, a reform which lowers the protection on inputs and capital goods but leaves the protection on final goods intact ends up increasing the effective protection though it may reduce the average level of protection. There are various ways of lowering the level and dispersion of tariffs. World Bank recommends simple schemes as opposed to case by case or fine tuning methods. One simple way would be to follow the so called concertina approach to cut tariffs above a certain ceiling and then further reducing them to a lower ceiling and so on. This may lead to low adjustment cost without leading to increases in effective protection rates.

(c) As long as the average tariffs are not zero, discrimination against exports will remain which can be offset by subsidising them or making inputs available at world prices. However, this may require budgetary resources that may not be readily available. Administering a subsidy may also encounter administrative problems and may encourage rent seeking. It may further lead to WTO disputes and countervailing duties in importing countries.

Apart from above, trade reform should be associated with a real devaluation if current account is not to deteriorate and if employment losses in import-substituting industries are to be made up by employment gains in export promotion. Providing a realistic real exchange rate is vital to the success of trade reform and this would

require macroeconomic policy that manages inflation and nominal exchange rate in such a manner that domestic costs are kept in line with international prices.

Trade reform is partly a political process in which credibility and expectations play an important role. Rodrik (1989, 1990), in this context, emphasises the role of credibility and sustainability for successful implementation of reforms. Rodrik argues that trade reform will be successful if it moves resources away from sectors where they are less productive into sectors where they will be more productive. In the process of doing so considerable adjustment costs may be borne. The willingness of workers and entrepreneurs to bear these costs would depend on their views about staying power of these reforms. Therefore, it is not trade liberalisation per se but credible trade liberalisation that is the source of efficiency benefits. It is therefore incumbent on the policy maker to ensure that the reform is viewed as sustainable. If the trade reforms are viewed as unsustainable this leads to uncertainty in the policy environment and this can cripple the animal spirits of private investors. Weakly credible reforms create uncertainty in the private sector in two ways. They create doubt about the kind of policies the government would follow when the reversal materialises as well as to the timing of the reversal. In such an atmosphere investors may prefer to keep their wealth abroad in liquid form and may shun physical investment until some of the key uncertainties are resolved.

There are a number of reasons why credibility problems may arise. Credibility problems may arise because the government is engaged in following inconsistent policies. For example, if the exchange rate is sizeably overvalued the private sector can soon figure out that the resulting current account deficits are unsustainable. Therefore, trade liberalisation that is not accompanied by a sufficiently large devaluation will be perceived as unsustainable. Credibility problems may also arise due to dynamic inconsistency of policies. The government may be tempted to revert to the previous policies after the private sector responds to reforms. For example, the government may promise subsidy to exporters upon exports and once the exports are shipped the government may backtrack on its commitments. Trade reforms may also run into problems because of distributional implications: factors of production specific

to export production may gain and those specific to import-competing activities may lose out. When considerable political opposition is expected due to redistribution, entrepreneurs may prefer to wait until the dust is settled-until either the reform becomes well entrenched or it is decisively defeated. Unsettled macroeconomic environment is the perhaps the greatest enemy of trade reforms. High inflation, low growth and high real interest rates may all distort relative prices and may diminish the ability of the private sector to adjust to the changes in relative prices. In many cases the credibility is damaged because the public is unsure about the true motives in implementing the reform. The government may be implementing reform under World Bank or IMF pressure and its own commitment to reform may be weak. A reform can also end up being reversed for no better reason than a widespread pessimism that it will not survive. In such a case the supply and investment responses may not be forthcoming and the reform may fail.

The importance of sustainability derives from the fundamental link between stability and private investment. The government committed to reforms has to ensure a stable environment, the key components of which are: (a) stable macro policies, chiefly a small fiscal deficit and a realistic exchange rate policy; (b) a credible and predictable set of microeconomic incentives, widely expected to be sustained into the indefinite future; and (c) the absence of sharp distributional changes that would create political pressures to reverse course down the line. The eradication of allocative inefficiencies through liberalisation may sometimes have to play a secondary role when it threatens policy stability.

Liberalisation can result in benefits only if it is perceived to be credible and sustainable. In Rodrik's (1990) words, "getting prices right in a temporary manner can easily do more damage to resource allocation than leaving them distorted. The uncertainty induced by such policies can seriously damage private investment, as well as discredit other reforms implemented simultaneously" (p. 939). The conclusion, therefore, is that if liberalisation comes in conflict with the requirements of sustainability then it may have to take a back seat, at least for the time being.

Finally, the range of trade reform should preferably be narrow but its magnitude ambitious. In Rodrik's view, credibility and sustainability require a big push rather than gradualism. A big push may be required to defeat a sense of deja vu on the part of workers and entrepreneurs; to neutralise the sluggishness of private-sector responses arising out of capital irreversibilities; and to build up a constituency for reform as quickly as possible.

Part II: Trade Policy and Growth: Empirical Evidence

Prebisch and Myrdal prescribed import protection and export taxes on primary products for developing countries. These policies came to be widely pursued after World War II. Since primary exports faced inelastic demand conditions in the world markets, a policy that raised their prices was expected to increase export earnings of developing countries. Yet in Prebisch's own country Argentina this led to reduced export-market shares rather than increased export earnings.

Kravis (1970) showed that after gaining export shares in earlier periods, developing countries lost market shares in primary as well as manufactured exports during 1953 to 1966. Excluding fuels, the primary exports of developing countries increased by 1.8% per year as compared with a growth of 5.7% per year for developed countries during the above period. As we noted earlier, the differential export performance of developed countries was linked to their success in increasing export market shares and diversifying exports. This, in turn, was the outcome of policies followed rather than external factors.

In this chapter, we survey the empirical evidence on the impact of trade policy on growth. Edwards (1993) has classified modern empirical work on trade policy and growth into two broad categories: (a) large scale multi-country studies that have investigated in detail the experiences of a group of countries with trade policy reform. These studies have often been sponsored by multilateral institutions and have led to book length research on each country studied; (b) econometric studies that have investigated, on the basis of cross-country data, the relationship between export

expansion and growth. To this list we have added two more: (c) studies using alternative indicators of trade orientation; and (d) those using subjective indices of trade orientation.

2.II.1 Multi-country Studies

The studies by Little, Scitovsky and Scott (1970) and Balassa (1971) are path-breaking works and have analysed the commercial policies of a number of countries and their impact on economic growth. The Little et al project dealt with Argentina, Brazil, Mexico, Malaysia, Pakistan, Philippines and Norway.

The most important contribution of these studies was the computation of effective rates of protection (ERPs) for each country so as to see how the structure of protection provided to intermediate and final goods affected the relative profitability of sectoral value added. It was shown that degree of protection granted to manufacturing value added was significantly higher than suggested by nominal protection rates. From this it was concluded that most developing countries had excessively protected their industries at the cost of agriculture and exports. The emerging policy recommendation was that developing countries should reduce their degree of protection and open up their economies to international competition.

These studies captured the structure of protection in various countries studied at a point of time and no attempt was made to study the evolution of ERPs over time. As a result no serious effort was made to analyse liberalisation episodes. Secondly, the studies concentrated on the characteristics of import-substitution regimes and did not investigate the characteristics of alternate trade regimes or how specific countries evolved from one trade regime to another.

Another multi-country study was undertaken by Bhagwati (1978) and Krueger (1978) and makes an attempt to classify trade regimes. The study included nine individual countries but no volume on these countries was published. Trade orientation was sought to be captured by the degree of bias against exports (B) and this was defined

as a ratio of effective exchange rate of imports to effective exchange rate for exports. When B is less than one, it implies export-promotion regime and when greater than one, import-substitution regime. When B equals one, it represents a neutral regime.

In the above study trade liberalisation was defined as any policy that reduces the anti-export bias. However, this can be achieved by maintaining high tariffs and then offsetting their effect by subsidising exports. With time, however, the concept of liberalisation has acquired a sharper focus where all trade distortions are sought to be removed including tariffs and subsidies. This position of liberal trade has been criticised by Deepak Lal and S. Rajapatirana (1987) who argue that there is no firm evidence linking liberal trade regime and economic performance. In the empirical country cases, Bhagwati and Krueger mostly made use of reduction in import licenses premium as the fundamental step in trade liberalisation.

Krueger and Bhagwati also attempted a five-phase definition of trade regimes as these evolve over time. Phase I is characterised by across the board imposition of quantitative restrictions usually associated with balance of payments crisis. During Phase II, the control system becomes more complex and discriminatory increasing the anti-export bias of the regime. Phase III marks the beginning of the liberalisation process in which devaluation is accompanied by relaxation of quantitative restrictions. In Phase IV, the process of liberalisation is continued and quotas are replaced by tariffs. In Phase V, the economy is fully liberalised where current account is fully convertible and quantitative restrictions are no longer used.

Bhagwati and Krueger consider devaluation as an important liberalisation policy. The reason is that in the presence of quantitative restrictions a real devaluation will reduce rents accruing to import licenses and therefore the premium on them will be lower. This will result in a reduction in anti-export bias.

Using the data from individual country studies, Krueger (1978) econometrically tested two hypothesis: (a) more liberalised regimes result in higher rates of growth of exports and (b) a more liberal trade sector has a positive effect on aggregate growth.

Krueger tested these hypotheses using pooled data for traditional and non-traditional exports.

(1) $\text{Log } X_{it} = a_{0i} + g \log REEX_{it} + rT_t + a_1d_1T_t + a_2d_2T_t + a_3d_1 + a_4d_2 + u_{it}$

where X_{it} = non-traditional or traditional exports in country i in period t

REERX = real effective exchange rate for exports

T_t = linear time trend

d_1 = dummy that takes value of one in phase I and II and zero otherwise

d_2 = dummy equal to one in phase IV and V and zero otherwise

(2) $GNP_t = b_0 + b_1T_t + b_2 \log X_t + b_3d_1T_t + b_4d_2T_t + u_t$

where X_t is an index of dollar value of exports of country i in year t relative to i's average exports over the entire period

The results of the regression analysis showed that a more depreciated real effective exchange rate for exports (REERX) has a positive impact on non-traditional exports; traditional exports however are not sensitive to changes in REERX. For both types of exports, d_2, the dummy variable for phases IV and V, was significantly positive suggesting that a move to a more liberalised regime also has a positive effect on export growth. However, REERX was more important than movements in the liberalisation ladder.

As far as GNP growth is concerned, Krueger argued that her estimates provided strong evidence in favour of an indirect effect of liberalisation on growth. Higher exports positively affect GNP growth. However, dummy variable coefficients were not significant suggesting that there is no direct effect of liberalisation on growth.

2.II.2 Econometric Studies Using Cross-country Data

In the multi-country studies, only a few countries were studied. Some researchers have tried to broaden the scope of the enquiry by using larger cross-country data to test econometrically the relationship between trade orientation and growth. One way of doing that would be to establish a correlation between rate of growth of exports and that of output, where export growth is taken as a proxy for outward orientation.

Michaely (1977) suggested that this correlation is not appropriate as exports are a part of output and the problems of multicollinearity arise. Therefore, in his 41 country sample for 1950-73, Michaely used rank correlations between rate of growth of export shares of GDP and output growth. He found that the Spearman rank coefficient was significantly positive (0.308) for the entire sample and 0.523 for a sub-sample of 23 middle income countries.

Heller and Porter (1978) noted that Michaely's own procedure of correlating growth rate of export share of output with output growth is subject to the same criticism as cited by him. Therefore, they suggested replacing output growth with growth of output net of exports. The authors obtained a high positive correlation between the two variables in a cross-country study using a sample of 41 countries. Their results were reconfirmed by Balassa (1978) who correlated export growth with growth of output net of exports by using pooled data for nine countries for the period 1960-73.

Edwards (1993) notes that the above results suffer from three main criticisms. Firstly, by looking at correlation coefficient other factors affecting output growth are ignored. Secondly the issue of causality between export growth and output growth is not addressed. Thirdly the above results are not based on a model or firm theoretical foundation.

Feder (1983) bases his work on a model derived from neo-classical production function. The idea behind this approach is that exports contribute to output growth in two ways. Firstly, they generate externalities in rest of the economy through improved

techniques of production and better management. Secondly, the export sector is more productive and, therefore, its expansion relative to other sectors has a positive net effect on total output. Feder uses the following equation for rate of growth of GDP.

$$\dot{Y}/Y = a\,(I/Y) + b\,(\dot{L}/L) + c\,(X/Y)\,(\dot{X}/X)$$

Feder used a sample of 31 semi-industrialised countries to estimate the above equation from the period 1964-73. The hypothesis tested was whether the coefficient of (X/Y) ($\dot{X}$ /X) was significantly positive. He obtained the following result with t statistic in brackets:

$$\dot{Y}/Y = \underset{}{0.002} + \underset{(.180)}{0.178}\,(I/Y) + \underset{(3.542)}{0.747}\,(\dot{L}/L) + \underset{(2.862)}{0.422}\,(X/Y)\,(\dot{X}/X)\ \ \underset{(5.454)}{}$$

$$R^2 = 0.69$$

From these findings Feder interpreted that marginal factor productivities in export sector are higher than in the non-export sector. He also tried to disentangle export productivity from export externality by estimating an equation that included ($\dot{X}$ /X) as an additional regressor. He found that both effects are positive but export externalities were relatively more important than productivity differentials.

Ram (1985) has used a simpler model where exports enter the production function as an additional variable: Y = f (K, L, X). In this case, the relevant exports variable is ($\dot{X}$ /X) and not (X/Y) ($\dot{X}$ /X) as in Feder. A problem with this simpler formulation is that the channels through which exports impact upon GDP are not specified. Based on this, Ram estimates the following equation:

$$\dot{Y}/Y = a + b\,(I/Y) + c\,(\dot{L}/L) + d\,(\dot{X}/X)$$

where b is marginal physical product of capital and c and d are elasticities of output with respect to L and X.

Ram estimated this equation by using data on 74 developing countries for the periods 1960-70 and 1970-77. He also introduces dummy variables to differentiate between low and middle-income countries. His findings are: (1) in all cases export variable has large and statistically significant coefficients; (2) the effect of export growth on GDP is larger in 1970-77 than in 1960-70 as might be expected from the fact that greater strain on balance of payments during 1970-77 would have made export performance more important to economic growth; and (3) the export coefficient is larger for middle-income countries than for low-income countries during 1960-70 but during 1970-77 this differential almost vanishes. From this he concludes that export performance does seem important for economic growth.

The above studies suffer from a number of drawbacks: (a) the problem of in-built correlation between exports and GDP, as exports are a substantial part of GDP; (b) the omission of world trading environment; (c) the strength of the relationship may be stronger for middle-income countries; (d) the issue of causality between export growth and income growth is not addressed; (e) the results lack robustness to the inclusion of other explanatory variables or the sample chosen; and (f) the problems related to equation specification. These criticisms are discussed below.

2.II.2(a) the problem of in-built correlation:

Sheehey (1990) argues that the above results based on correlations or production function type regressions are biased by an in-built correlation between exports and GDP as exports are a substantial component of GDP. Sheehey argues that these empirical tests have no bearing on export promotion-import substitution controversy. Using correlation as well as regression framework, he applied the same tests to all other major subcategories of GDP and it was found that they had a similar relationship to GDP as exports. This suggests that the tests seem to be capturing a correlation with GDP common to all large categories of production. Therefore, the superiority of export promotion must rely on evidence other than cross-country tests. In another paper, Sheehey (1992) argues that if one takes alternate export variables not subject to this bias (i.e. X/Y ratio and rate of growth of this ratio) then the

relationship between exports and growth is not robust at all. It was found that X/Y ratio generally showed negative relationship with GDP during the period 1960-81. As far growth in X/Y is concerned, it had a positive impact on growth for more industrialised countries in the 1960s, a period of strong growth in world trade. In general, a stronger trade orientation may result in lower output growth particularly during a period of weak world demand.

2.II.2(b) neglect of world trading environment

This brings us to another issue. Is the export-GDP relationship sensitive to rate of growth of world trade? If that is the case, the success of the outward-orientated strategy would depend upon the world market conditions.

One way of taking account of the world market environment would be to compare the results of the cross-country growth equation for two or more periods. Some authors have tried to run regression equations for pre and post 1973 oil shock. Balassa (1985) found that the coefficient of ($\dot{X}$ /X) is higher for 1973-79 period than for the earlier 1960-73 period. Similarly Ram (1985), as we noted, found that the coefficient of ($\dot{X}$ /X) is higher for 1970-77 than for 1960-70. Ram (1987) in another paper divides his sample of countries before the oil shock (1960-72) and after the oil shock (1973-82). For vast majority of the countries the coefficient for the later period is greater than that of the earlier period. The results of these earlier studies led Balassa to conclude that in the face of the external shocks outward-orientated strategy showed better results in terms of economic growth.

Rana (1988), however, pointed out that Balassa's method is not strictly comparable as his pre-1973 sample included 11 countries and post 1973 sample had 41 countries. Rana reestimated the equations using the same group of countries in both the periods. Using pooled data he found that the coefficient of the export variable turned out to be smaller for the post 1973 period than for the pre 1973 period. These results were supported by Kohli and Singh (1989) who found that the coefficient of the export

variable was always significant in the first period while it was not always so in the later period.

Another approach to take account of the world economic environment is to classify countries in two categories: those facing favourable world demand and those facing unfavourable demand. Gray and Singer (1988) divide the countries between those facing above average world demand and those facing below average world demand. They found that Spearman correlation coefficient was significantly positive for countries facing above average world demand and insignificant for those facing below average world demand. This led Gray and Singer to conclude that outward orientation could not be considered as a universal recommendation for all conditions and for all countries.

2.II.2(c) Is the strength of the relationship confined to middle-income countries?

Another drawback of the approaches linking exports with GDP is that these findings may be confined to middle-income countries. As we noted earlier, Michaely had found the correlation was higher for the middle-income countries than for the whole sample. Helleiner (1986) has argued that a minimum level of development is required before a country can reap the benefits of export promotion. Moreover export-promotion policies are likely to have doubtful effects for the poor countries of Africa.

In addressing this criticism Ram (1985) made use of dummy variables to capture the differential between middle and low-income developing countries. The criterion used for differentiating the countries between poor and middle income is per capita income of $300 in 1977, the same as used by the World Bank. As we noted, he found that during 1960-70 the impact of export performance on growth was larger for middle-income countries but during 1970-77 the differential almost vanishes. Kohli and Singh (1989), on the other hand, distinguish between countries on the basis of a minimum critical threshold related to trade structure rather than per capita income. Of the 41 countries, those having more than 6% export growth per annum or exports to GNP ratio exceeding 17% were classified as outward orientated and others as non-outward

orientated. Using Feder's model, they found that during 1960-70 the coefficient of export growth was significantly positive for both group of countries but significantly larger for outward-orientated countries. For the period 1970-81, however the coefficient of the export variable was insignificant for both group of countries.

2.II.2(d) the issue of causality

Another problem with above studies relates to causality. Most of the studies using regression framework noted above assume that the causality runs from exports to GDP. However, it is plausible to argue that it is the faster growing countries that have a more dynamic export sector. It is also equally plausible to argue that there could be simultaneity in the relationship between exports and GDP. Some authors have tried to test the direction of causality between exports and growth. Jung and Marshall (1985) have used 37-country sample to perform Granger-causality technique and found that in 22 cases it was not possible to establish the direction of causality without ambiguity. Only in four cases, the direction of causality ran from exports to GDP. These were Egypt, Indonesia, Costa Rica and Ecuador. Hutchinson and Singh (1987) have applied Granger causality test to 34 countries and found that only in ten countries causality ran from exports to GDP; in three cases GDP growth caused export growth; while in 18 cases it was not possible to establish one-way causality.

Bahmani-Oskooee et al. (1991) have criticised the Granger test on the grounds that there is arbitrariness in the choice of lags and in the level of significance. They, therefore, employ the two-stage procedure developed by Hsiao to overcome the shortcomings of the Granger procedure. Love (1994) uses Hsiao synthesis to examine the two engine of growth hypothesis: (1) that export growth is positively and causally related to income growth; and (2) that growth of government sector is positively and causally related to income growth. Using time-series data for 20 countries and employing Heller and Porter approach of defining income net of exports, Love finds weak support for exports as an engine of growth hypothesis. While ten countries exhibited positive causality from exports to income, the number of countries exhibiting such causality drops to five if income is taken net of exports. In contrast to

the case of export growth, Love finds very little evidence consistent with government-led-growth hypothesis.

Bahmani-Oskooee and Alse (1993) have criticised the studies based on the standard causality procedures on the grounds that these procedures cannot be applied without taking into account the cointegrating properties of the concerned variables. If exports and GDP variables are cointegrated then the standard Granger test is inapplicable and may lead to misleading results. In this case another channel of causality opens up through the error-correction term. Therefore, they recommend cointegration and error-correction modelling to combine the short-term as well as long-term causal impacts. Employing this methodology and using quarterly data, they find that there is a strong empirical support for two-way causality between export growth and GDP growth in 8 out of 9 countries studied.

Esfahani (1991) has tackled the causality problem by employing three-equation framework. He finds that when his growth equation is estimated using two-stage least squares, the estimated coefficient of (X/Y) ($\dot{X}$ /X) became insignificant. Moreover, most of the literature analysed above is based on the presumption that exports generate positive externality. Esfahani, however, argues that exports also help relax foreign exchange constraint as in two-gap models. Therefore, ignoring imported inputs biases the coefficient of the export variable upwards and once intermediate imports are included, the coefficient of (X/Y) ($\dot{X}$ /X) drops and even becomes insignificant for some sub-periods.

2.II.2(e) robustness of results

This brings us to the issue of robustness of the results linking export growth with GDP growth. Levine and Renelt (1992) examine whether the conclusions from the existing studies are robust or fragile to small changes in the conditioning information set. Using Leamer's (1983) extreme bound analysis, Levine and Renelt find that almost all results are fragile; and the statistical significance of nearly every structural and policy indicator is highly sensitive to the inclusion of additional explanatory

variables. The only robust results are positive correlation between GDP per capita growth and the share of investment in GDP and between the investment share and the ratio of international trade to GDP.

As far as the effect of trade-policy indicators is concerned, the extreme bound analysis used by Levine and Renelt yields three important results. First, if one substitutes imports or total trade for exports in cross-country growth or investment regressions, one essentially obtains the same coefficient estimate and coefficient standard error. Thus researchers, who identify a significant correlation using an export performance measure, should not associate this result with exports per se because it could be obtained by using a corresponding measure of import or total trade. Second, the share of trade in GDP is robustly and positively related to the share of investment in GDP. The same result was obtained using exports to GDP ratio or import to GDP ratio. Finally, in the presence of investment share in GDP in the equation, there was no robust independent relationship between any trade or international price distortion measure and growth; although exports to GDP share was found to be robust in growth equation when investment variable was dropped. Thus, on the basis of these three results, Levine and Renelt conclude that the relationship between trade and growth is based on enhanced investment and not necessarily through improved resource allocation.

Levine and Renelt did not find any robust relationship between any trade-policy indicator and growth; nor did they find any robust link between any human capital variable and growth. Levin and Raut (1997) confirm these findings using panel data for a sample of 30 semi-industrialised countries over the period 1965-84. They find the same sensitivity of results to changes in time period, selection of countries and explanatory variables that was documented by Levine and Renelt. However, Levin and Raut find a strong and robust evidence of an interaction between average education and growth in export GDP ratio, which earlier studies have not considered. Their results indicate a high degree of complementarity between trade policies and education expenditures and provide new empirical support for the hypothesis that export orientation contributes to economic growth through economies of scale and

other sectoral productivity differentials and not merely by relaxing import capacity constraints. In addition, growth in the manufactured exports/GDP ratio has a strong influence on economic growth, whereas growth in the ratio of primary exports to GDP has negligible influence, indicating that increasing returns and other efficiencies are mainly concentrated within the manufactured export sector. These findings lend support to policies that simultaneously promote investment in human capital as well as investment in manufactured export sector.

2.II.2(f) problems relating to equation specification

Finally, the cross-country regression results suffer from the problems related to the specification of the equation. In linking export growth with GDP growth, certain important factors such as role of human capital and intermediate imports get omitted. We have seen that Esfahani's results show that exports also help relax the foreign exchange constraint as in two-gap models; once intermediate imports are included, the coefficient of the export variable drops and even becomes insignificant. Similarly, the assumption of a linear relationship between exports growth and GDP growth has also been questioned. When the quadratic term (X/Y) $(\dot{X}/X)^2$ is added to the equation, its coefficient turns out to significant implying that effect of export growth on GDP growth is subject to diminishing returns (Kohli and Singh, 1989).

2.II.3 Alternative Indicators of Trade Orientation

As we saw, the simplest measure of trade orientation uses the actual trade flows such as growth rate of exports, growth rate of imports, share of imports or exports or total trade to GDP. The positive association obtained by researchers between an export performance measure and growth could be obtained by substituting the export performance measure with any other trade flow measure. One problem with the trade flows is that they are at best an imperfect proxy for trade policy. Apart from trade policy, trade flows are affected by other factors such as country size, population, resource endowments etc. For example, large countries generally have smaller trade shares.

Therefore, one improvement over the trade-flow approach is to use the deviations of actual from predicted trade flows based on variables such as country size, resource endowments etc. This is done by Syrquin and Chenery (1989), who adjust the actual trade flows for certain structural characteristics of a country mentioned above.

Balassa (1985) constructed an index of trade policy as the deviations of actual exports from the exports predicted by a structural model of trade. He assumed that exports are a function of per capita income, population and mineral resource availability. The residuals in the cross-country export equation were used to measure trade orientation; positive ones indicating export promotion and negative ones inward orientation. When this trade variable was included in the growth equation, its estimated coefficient was significantly positive for a sample of 43 countries studied over the period 1973-79.

Another approach, introduced by Leamer (1988), uses an empirical Heckscher-Ohlin model with nine factors to estimate net trade flows and trade intensity ratios for 183 commodities and 53 countries. He then takes the differences between the predicted and actual trade intensity ratios as an indicator of trade barriers. Leamer uses this approach to construct two types of indicators: openness indicators and intervention indicators. The openness indicators measure the impact of trade policy - tariff as well as non-tariff barriers - in restricting imports. The intervention indicators capture the extent to which commercial policy distorts trade, either positively or negatively. The main difference between the two is that the intervention measures, apart from capturing the impact of trade restrictions, also capture the role of subsidies.

Edwards (1992), using Leamer's indicators, finds a strong and robust relationship between trade orientation and economic performance. The countries with more open and less distortive trade policies have tended to grow faster than those countries with more restrictive commercial policies. Edwards' findings are robust to the choice of trade policy indicator, estimation method, sample selection, measurement error correction, equation specification and time period used. Edwards uses nine alternative

indicators of trade policy to check the robustness of his results. These alternative indicators are: average black market premium, coefficient of variation in the black market premium, index of relative price distortion, average import tariffs, average import tariffs for the manufacturing sector, average non-tariff barriers coverage, World Development Report's (1983) index of trade distortion, index of effective rate of protection and World Bank (1987) index of outward orientation. Edwards, however, believes that these indices are less desirable as compared to Leamer's indicators but are used by him to check the robustness of the results. Leamer's indicators are the best that one could possibly obtain in a cross-country setting. They are objective, comparable across countries and continuous. Moreover, they collapse the effect of tariff and non-tariff barriers into one index.

Dollar (1992) uses an outward-orientation index based on exchange rate distortion and variability. He finds that there is a significant and negative relationship between distortion in the real exchange rate and growth of per capita GDP, after controlling for the effects of real exchange rate variability and investment level. The potential gains to Latin American and African economies of following more outward-orientated policies are quite large. Per Capita GDP growth rate would increase an estimated 1.5 to 2.1 percentage points if these regions shifted to Asian-type trade policies.

Pritchett (1996) examines the link between the various empirical indicators used in the literature to measure the trade-policy stance. He finds that that these measures of trade policy are completely uncorrelated across countries. If this is so then the conclusion of the studies based on these indicators that outward-orientated countries perform better is doubtful. Two implications of the paper are: (1) no reliable, robust estimate of the impact of outward policy orientation on economic performance is likely to be possible from cross-country data; and (2) the alternative objective summary measures of trade policy produce entirely different country rankings in terms of outward orientation.

Harrison (1996) finds that the correlation between the various measures of trade policy may not always be strong; there is generally a positive association between

growth and different measures of openness. The strength of the association is stronger if one uses the panel data that combines cross section and time series. The results of the vector autoregressions suggest that the causality between openness and growth runs in both directions.

2.II.4 Studies Using Subjective Indices of Trade Orientation

Edwards (1993) notes that most cross country econometric work on the relationship between trade orientation and growth implicitly or explicitly follows two-stage methodology. In the first stage it is assumed that more liberalised economies experienced faster growth of exports. In the second stage it is tested whether countries with a faster growth of exports have experienced a more rapid growth of GDP. A positive answer to second proposition is construed as evidence for outward orientation and liberalisation fostering growth. The fundamental reason why this two-stage approach is so popular is the difficulty in measuring trade policy or trade orientation directly.

As an alternative, one may construct subjective indices of trade orientation in which the researcher uses his information to classify countries in various groups. The World Bank (1987) study has classified a sample of 41 developing countries into four groups: strongly outward orientated, moderately outward orientated, moderately inward orientated and strongly inward orientated. In doing so four indicators- quantitative and qualitative- have been used. They are effective rate of protection, use of direct controls such as quotas and import licensing schemes, use of export incentives and degree of exchange rate overvaluation. Each group of countries is then examined for two periods, 1963-73 and 1973-85.

The economic performance of the four groups is judged by specific indicators taken as weighted group averages. These are growth rate of GDP, growth rate of per capita income, gross domestic saving ratio, growth of manufactured exports and inflation rates. It was seen that economic performance in terms of above indicators has been broadly superior for outward-orientated economies as compared to inward-orientated

economies "in almost all respects". It is further pointed out that although governments adopt inward orientation to promote industrialisation, yet various indicators of industrialisation such as growth of manufacturing value added, share of manufacturing value added in GDP, share of labour force employed in industry and growth of employment in manufacturing, show that outward-orientated economies have performed better. The outward-orientated economies also did better in terms of agriculture value added and reduction in income inequalities. The study cites evidence from Fields (1984) to show that outward-orientated strategy has led to improvement in distribution of income as measured by Gini coefficient. The study further cites evidence on total factor productivity growth to suggest that rapid economic growth and efficient industrialisation are usually associated with outward orientation.

The classification adopted by World Bank study is based on criteria that are largely subjective and, therefore, subject to criticism. For example, many researchers have objected to Korea's classification as strongly outward orientated, although it is well known that government played a key role in Korea's success. Moreover, Korea is classified as strongly outward orientated in both periods, 1963-73 and 1973-85, even though Korea's trade regime in the earlier period was significantly more restrictive. Another interesting fact to note is that Chile is classified as only moderately outward orientated, whereas another World Bank study by Papageorgiou et al (1991) gave Chile a perfect score of 20 in its liberalisation index.

Singer (1988) has criticised the World Bank study on the grounds that different initial levels of per capita income of the four groups of countries have not been taken into account in demonstrating that outward orientation works better. Strongly inward-orientated countries consist of poorer countries as compared with outward-oriented countries; and "as we move along the scale, there is a regression in per capita income level even clearer and more striking than the regression in economic performance highlighted by the WDR" (p. 233). If this is taken into account then "what the WDR analysis really tells us is that poorer countries find it more difficult to progress than countries already further up the development ladder, such as the NICs and middle income countries. This is none other than the old principle of vicious circles of

cumulative causation emphasised by Myrdal, Nurkse and other structuralists so disliked by the neoclassicals who seem to dominate the WDR" (p. 233)

Some authors have extended the World Bank analysis further by making use of regression framework. Alam (1991) points out that studies using export growth as a proxy for outward orientation suffered from the limitation that the connection between export growth and trade policy remained unproven. To overcome this problem, he made use of a more direct measure of trade orientation made available by the World Bank for a sample of 41 countries for two successive time periods. Since the World Bank uses a fourfold classification of trade orientation, Alam assigns the values ranging between 1 and 4 to the countries, with the highest value taken by the strongly outward-orientated regime. By using simple regression framework, the relationship between trade orientation and various macroeconomic variables is then examined. His results show a positive and statistically significant relationship between outward orientation and export and output growth rates for both time periods. A positive relationship between trade orientation and saving or investment rates was also obtained but these were considerably weaker especially for the first period. This suggests that the impact of trade policies on growth rates acted more strongly through increases in productivity rather than through increases in investment rates. This was corroborated by the results of estimations that regressed output growth rates on labour growth, investment rates, export growth rates and trade orientation dummies. Pooling data from the two time periods to avoid problems of multicollinearity, it was found that productivity growth rates are positively associated with outward orientation as well as export growth rates.

Clark (1995) notes that while studies have concentrated on studying the impact of trade orientation on growth, little attention has been paid to study the relationship between trade orientation and growth of the industrial sector. Industrial growth, in economic development, can be viewed as a diffusion process by which industrial sector increases its share in total output over time. Clark makes use of the trade orientation values (ranging from 1 to 4 for 41 countries) as noted above to study the relationship between trade orientation and diffusion of industrial activity. To measure

the diffusion of industrial activity, logistic growth functions of the share of manufacturing value added in GDP are estimated. Industrial diffusion rates are then related to measures of trade orientation and it is found that a significant positive relationship exists between the two. When dummy variables are used to represent trade policy, economies with higher outward orientation are found to have significantly higher rates of industrial diffusion than strongly inward oriented economies. Thus outward-orientated policies are found to be superior in fostering industrial development and developing countries will industrialise faster through export promotion strategies than by import substitution.

Another World Bank study, which constructs subjective indices of trade orientation, was edited by Papageorgiou et al (1991). The authors of the study take the benefits of liberal trade for granted. It is the timing, phasing and sequencing involved which forms the subject matter of study. The focus is, therefore, on the issues of transition. In the light of the difficulties faced by earlier studies in classifying countries in different trade regimes, this study constructs subjective index of trade liberalisation for 19 countries for as many years as possible between 1948-85. The index takes the value 1 to 20 depending on the degree of openness in an economy. The study defines trade liberalisation as "any change which leads a country's trade system toward neutrality in the sense of bringing its economy closer to the situation which would prevail if there were no government interference" (Vol. 7, p. 20). Score 1 represents the highest degree of intervention and 20 the most liberal regime. It is interesting to note that of the 19 countries studied only Chile gets the perfect score of 20, as mentioned earlier.

The authors admit the weakness of their index. They emphasise that it is ordinal in nature and not cardinal and, therefore, wholly subjective. It is thus not comparable across countries but only over time within a country. Consequently, as Edwards (1993) notes "the indices could not be used as indicators of trade orientation in their cross-country analysis; instead they had to rely on dummy variables to classify different episodes" (p. 1367).

Greenaway (1993) has pointed out that a crucial deficiency of the above study is the absence of an explicit analytical framework within which individual analyses are implemented. The definition of liberalisation is inconsistent; its measurement varies from one study to another; and authors are given free reign in the data and techniques they use to evaluate the evolution and aftermaths of liberalisations. Therefore, the key components of the methodology create problems when inferences are drawn. One could have improved the utility of the study if three things are done: (1) define liberalisation more clearly; (2) identify an aggregate measure of distortion which can be used to assess the extent of liberalisation; and (3) given above, one would have a more powerful instrument for discriminating between episodes and experiences. Once the common set of tools is available, different episodes can be evaluated and compared. In Greenaway's words: " It is not sufficient for all parties to ask the same questions if they then give inconsistent answers, or obtain their answers inconsistently. If the answers are to be compared, the means of eliciting those answers should as far as possible be comparable" (p. 221).

2.II.5 Conclusions

The empirical debate on the relationship between trade policy and growth appears to be inconclusive (if the judgement is based on earlier studies on the subject). Edwards (1992) gives two reasons for this state of affairs. Firstly, the theoretical framework underlying the relationship was weak. While the theory was clear on the static gains of trade, its generalisation to a dynamic equilibrium growth setting presented some problems. It is only recently, with the development of endogenous growth theory, that some important progress towards providing a more convincing and rigorous conceptual framework has been made. It is now possible to establish a long-run equilibrium relationship between openness and economic growth. In the neo-classical approach steady state growth is independent of national policies. Secondly, the empirical work has suffered because it is very difficult to measure trade orientation that can be used for time-series analyses as well as cross-country comparisons.

However, it may be pointed that recent cross-section work by Edwards (1992), using alternative trade-policy indicators, finds that there is a strong and robust relationship between trade orientation and economic performance. Edwards' findings are robust to the choice of the trade policy indicator, estimation method, sample selection, equation specification and time period used. Further, Edwards (1998) finds robust evidence to suggest that more open economies experienced faster total factor productivity growth. It is important to note that Edwards (1992, 1998) employs a new growth theory framework, which makes economic growth endogenous, to take note of the criticism cited above.

Similarly, recent time-series studies (for example, Bahmani-Oskooee, 1993) investigating the issue of causality between export growth and income growth in a cointegration cum error-correction modelling framework have found overwhelming support for the export-led-growth thesis. While there is ample evidence in favour of export-led-growth hypothesis, support for the alternative government-led-growth hypothesis is almost non existent (Love, 1994). So the recent contributions on the subject make it appear that trade policy has a robust influence on growth and productivity. Even if it is assumed that the debate on the impact of trade policy on growth is inconclusive, it cannot be denied that a more open policy stance would permit a country to make better use of the world trading opportunities as and when they arise; the country may be denied these opportunities if it adopts an inward-looking policy stance.

Many authors, who criticised the results of correlations or regressions linking export growth to GDP growth, have said that their analysis does not imply adoption of inward-orientated policy framework; the case for outward orientation, however, has to be built around evidence other than cross-country results. For example, Sheehey (1990) stresses that his "results in no way overturn the case for an export promotion strategy. They merely indicate that a large body of evidence that is supposed to demonstrate the superiority of this strategy has no bearing on this controversy" (p. 115). Further, "an export promotion strategy, if it does provide the benefits widely attributed to it, must rely on evidence other than these cross country tests" (p. 115).

Similarly, Pritchett (1996) finds that various empirical measures of trade policy are uncorrelated and lead to different country rankings in terms of outward orientation; therefore, conclusions about the superiority of outward orientation based on cross-country studies is doubtful. Edwards (1993) is of the opinion that the cross-country regression analysis, on its own, may not have played much of a role in the recent popularity of outward-orientated policies. Successful experiences of Korea, Chile and other countries have much to do with how advisors and politicians think about trade orientation and commercial policy.

Assuming that exports (or trade) are important to economic growth, then what is the precise link between the two? Here again the opinion differs. In Feder's model the link between the two is through productivity and externality. Alam's results also suggest that impact of trade policy on growth is through increases in productivity rather than increases in investment rate. Levine and Renelt, on the other hand, argue that trade has a resource accumulation effect rather than resource allocation effect. Esfahani's findings suggest that the exports are important because they help relax the foreign exchange constraint in a two-gap framework. As we saw, when intermediate imports are included as an explanatory variable in his model, the coefficient of the export variable drops and even becomes insignificant. So in the empirical work the precise link between exports (or trade) and growth is not yet clear.

We have also noted that the relationship between trade and growth may suffer from lack of robustness. The results are sensitive to the inclusion of the explanatory variables, time period chosen and the selection of countries in the sample, as Levine and Renelt have shown. Levin and Raut have argued that this sensitivity results from the complementarity between trade policy and human capital indicators. Once the effect of both is combined then the results become robust. Further, manufactured exports/GDP ratio has a strong influence on growth, whereas the growth in the ratio of primary exports to GDP has negligible influence. This suggests that economies of scale and other efficiencies are mainly concentrated in manufactured exports sector. As a policy response this calls for simultaneous investment in human capital as well as investment in manufactured exports sector.

We also noted the evidence on terms of trade which suggests that there is a long-term secular decline in terms of trade for primary exports. This, however, does not imply inward orientation; rather, diversification is the key to expand manufactured exports. As we also noted successful export promotion is not due to favourable external factors; but due to internal factors affecting the mobility of resources and the policies geared to that end.

Growth is a complex phenomenon and many forces may be at work including trade policy. Too much should not be read into trade or trade policy. Trade can be regarded as one of the factors affecting growth. As Kravis has demonstrated trade was never an engine of growth. Better expression would be to say that trade acted as a handmaiden of growth; and this role it still continues to perform even today as it did in the nineteenth century.

The recent currency turmoil in South East Asian economies confirms that although they had the right trade orientation, that by itself was not enough. These economies suffered from weak financial systems (that could not make efficient use of funds), directed lending, excessive flow of foreign funds into the property markets, and large short-term borrowings vis a vis total borrowings. These countries were victims of their own success arising out of the policies of outward orientation; and they neglected crucial reform in the financial system. The lesson is not that outward orientation is bad; but that trade policy is one of the factors and crucial reform in other areas cannot be neglected.

Finally, the debate between export promotion and import substitution appears to be overdrawn. As we saw, the ill effects of import substitution do not result from import substitution per se; but from the extreme form of import substitution where the process is carried too far. Moreover, we also noted that export-orientated strategy calls for neutrality of the incentive structure between export promotion and import substitution. Interpreted in this manner, export promotion is consistent with efficient import substitution. Export-promotion strategy, in this neutral sense, helps in making

better use of the world trading opportunities as and when they arise; at the same time, it also allows for efficient import substitution in line with what a country can do better.

CHAPTER 3

TRADE POLICY AND GROWTH: INDIA'S EXPERINCE

When India became independent in 1947, it was natural to choose an import-substitution and inward-orientated strategy. During British rule trade was viewed with suspicion and was looked upon as an instrument of exploitation. Due to import of cheap machine made goods, the traditional handicrafts declined with the consequent adverse impact on incomes and employment. They were not compensated by a sufficient rise in modern industry. Under the colonial pattern of development, foreign investment was attracted into extractive industries that had hardly any links with the rest of the economy in terms of forward and backward linkages. This fostered dualism and inhibited growth. Therefore, the net impact of the British rule, it was argued, was to impoverish the country and to "drain" its saving or surplus. All this fitted quite well with the neo-Marxian thesis of development of the centre at the cost of the periphery.

India started its planned development in 1951. From the second plan onwards (starting 1st April 1956), emphasis was laid on heavy industries. The public sector was given a prominent role and was required to occupy the 'commanding heights' in the economy. The public sector was viewed as an important instrument to achieve the goal of "socialist pattern of society" and to engineer an economic take off. Private investment was to be regulated by industrial licensing in order to channel scarce investment resources in line with plan priorities. Imports were also controlled through import licensing, high tariffs and exchange controls. Indian five-year plans were conceived in a closed economy framework and were based on the assumption of export pessimism. India thus followed an inward looking strategy, and inspired by the Soviet Plans, went in for detailed forms of planning.

The objective of this chapter is to outline the trade and industrial strategy since independence and analyse its consequences. In the process we shall spell out India's model of growth since 1951 and sketch out the main features of this model. As we go

along, we shall spell out the administrative and legislative measures undertaken to give shape to India's development strategy. We shall also attempt to make an assessment of the strategy followed and try to judge its impact on economic performance particularly growth. In the light of India's experience we shall comment upon whether this strategy was justified. We shall also spell out the subsequent policies of trade liberalisation and their impact.

3.1 India's Model of Growth Since 1951

India's development strategy in the post-independence period was closely connected to the debates on India's development problems in the pre-independence period. On the one hand, there was the Gandhian approach that talked of self-sufficient villages and voluntary limitation of wants. It also talked of development that promoted harmony between man and nature. On the other hand, there was Nehru's modernising approach based on scientific spirit and socialist path of development within a democratic framework. Nehru was greatly influenced by Soviet planning and was very appreciative of Soviet socialism. The national planning committee set up by the Congress party in the pre-independence period reflected a strongly interventionist strategy. Inspired by the example of USSR, Nehru favoured a socialist framework for India and planning was viewed as an instrument to bring about rapid socio-economic transformation of the society and to uplift mass of the people.

Gandhi's approach was never considered seriously and seemed to lack a theoretical framework. Nehru's approach, on the other hand, appeared more attractive and held out a promise of a rapid transformation of a post-colonial economy. Chakravarty (1987) thus sums up the position as follows: "While the Gandhian approach has received a certain measure of support in recent writings of ecologists and ecologically minded economists, in the early fifties such positions appeared to lack any substantive theoretical foundations. Gandhi and his followers looked more like moralising old men than like people who could be expected to change the direction of society" (p. 8).

The first three five year plans bore the personal imprint of Nehru and were formulated under his active chairmanship of the Planning Commission. The second plan (1956-61), which emphasised heavy industry, marked a major break in India's economic thinking. This plan was formulated by the famous Indian planner, Professor Mahalanobis. The first three plans can be regarded as important attempts at giving concrete shape to the vision to which modernising school led by Nehru subscribed. The main features of the Nehru-Mahalanobis strategy, on which much of India's planning is based, is described in the following paragraphs.

3.1(a) Primacy to Capital Accumulation

One important feature of planning in India was that capital was regarded as the key to growth. This was in line with the prevailing thinking enunciated by development economists like Rosenstein Rodan (1943), Nurkse (1953) Arthur Lewis (1954) and others. Arthur Lewis had pointed out that the central issue for development economics was to understand how a country saving 4-5% of its income is transformed into one saving 12-15%. In this line of reasoning, the primary emphasis was on saving and investment. The questions of efficiency in the use of resources and the role of technical progress were ignored.

India's first five-year plan (1951-56) was based on the Harrod-Domar model which emphasised the role of saving in growth. Given a constant capital-output ratio, the growth is dependent on the saving rate. The model was also used to determine the additional savings, in the form of foreign aid, which were required to achieve the targeted rate of growth. Again, the questions of efficiency are assumed away in a constant capital-output ratio which is technically given.

The Second Five-Year Plan, 1956-61 (Government of India, 1956) which was based on the Mahalanobis model, emphasised the need to build ahead of demand in the area of capital goods production. The Mahalanobis strategy deviated from the "textile first" strategy of development followed successfully by late comer Japan. The Mahalanobis model was quite similar to the one developed by Feldman in 1928 in

USSR and popularised by Domar. The Indian work, however, was done independently.

In the Mahalanobis model, saving rate becomes structurally determined. It is assumed that what is physically possible and desirable can also be rendered financially feasible. By according higher allocation to capital goods sector, rate of investment and hence the rate of growth in the economy can be pushed up. However, this strategy does not go into the question of how a plan is to be financed. The experience of inflation in the mid-sixties, coupled with the government's reluctance to step up investment lest it added to the prevailing inflation, brought home the point that the problem of financing a plan has to be very carefully looked into.

The strategy of development formulated in the second five-year plan has by and large continued in the subsequent plans. The point is that, with their stress on capital accumulation, the Indian plans succeeded in pushing up the saving rate from 10% in 1951 to 20% and above in the 1980s; the growth rate did not register corresponding increases. The implication is that efficiency in the use of resources did not receive much attention.

3.1(b) Export Pessimism

Indian five-year plans did not explore the possibility of trade as a "handmaiden of growth" let alone trade as an "engine of growth". They were conceived in a closed-economy framework with the assumption of export pessimism. The planners were of the opinion that in the short run significant increase in export earnings could not be expected. The second five-year plan (1956) recognised that "it is only after industrialisation has proceeded some way that increased production would be reflected in larger export earnings" (p. 99)

Even if it is assumed that primary exports faced adverse demand conditions in the world markets, India could have turned to cotton textiles sector, which had already come up. However, the Indian planners neglected this option. Chakravarty (1987)

sums up the reasons as follows: "There may be different explanations for this neglect. But the usual explanations, given in terms of natural resource base (because of the poor quality of cotton grown in India) or an emphasis on maximising home consumption rather than on earning foreign exchange are inadequate, even though there is some basis for these judgements. I believe that the reason was basically political. Emphasis on textile exports would have required supporting a particular regional group of industrialists at the expense of others. Furthermore, there was the Gandhian legacy which viewed the textile sector as pre-eminently suited to small-scale initiative" (p. 16).

Mahalanobis was also of the opinion that employment generation through small-scale production needed emphasis particularly in small-scale textile sector. In his famous four-sector model, Mahalanobis wanted to combine high employment growth with building up of capital goods sector. He assigned an important role to the highly labour-intensive part of the textile sector for generation of employment. This meant that modern textile industry did not receive its due importance.

Thus while the Indian plans emphasised on capital goods, there was a parallel emphasis on small scale industries producing consumer goods and employing 'capital light' methods of production. As events turned out, the expected increase in the production of consumer goods did not materialise. Furthermore, while Mahalanobis had expected the learning effect of his strategy would lead to gradual decline in the cost of capital goods, this did not happen either. By the middle of sixties Indian economy found itself engulfed in a crisis situation with inflationary pressures and shortage of essential consumer goods. The planning process was thus thrown out of gear and to restore order plan holiday was observed for three years during 1966-69.

3.1(c) Self reliance

The objective of self reliance was emphasised in the third five year plan (1961-66). The second plan with the emphasis on heavy industries necessitated large scale import

of machinery. It became clear that second plan had grossly underestimated the import intensity of industrialisation. Foreign exchange became a constraint on development.

The objective of self reliance can be interpreted in two ways. In the first interpretation self reliance implies the ability to earn enough foreign exchange to pay for import requirements. The second interpretation implies import substitution in development strategy and assumes export pessimism. In India, since the planners talked of export pessimism, it is the second interpretation which was made the basis for planning. In the words of Ahluwalia (1991):

"It is important to recognise that self reliance or reduced reliance on external assistance is perfectly possible with a strategy that plans for higher levels of exports and imports. But in India self reliance, in practice, has been interpreted to mean a strong import-substitution orientation in the development strategy. In an extreme form self reliance was equated with self sufficiency which led to a position of favouring any displacement of imports by domestic production anywhere in the economy at whatever cost. The critical link between the objective of self reliance and import substitution orientation is the assumption of export pessimism" (p. 8).

From hindsight it appears that export pessimism for the sixties and seventies was not justified for India as the world trade expanded very rapidly during these decades. Moreover, many countries of South East Asia changed their strategy of inward orientation to outward orientation to reap the benefits of expanding world trade. Indian Planning, on the other hand, remained immune to the newly emerging realities and continued on the path of deeper and deeper import substitution. In Ahluwalia's (1991) words: "Essentially, planning for exports would amount to planning under uncertainty and risk- a much more demanding challenge than the theoretical exercise of inter-sectoral consistency worked out within a closed-economy framework" (p. 9).

3.1(d) Primacy to Public Sector

Indian planning adopted a mixed-economy framework with predominant role for the public sector. While the foundations for the mixed-economy framework were laid in the Industrial Policy Resolution of 1948, the predominant role of the public sector was brought out in the Industrial Policy resolution of 1956. In the 1948 Resolution certain areas of strategic importance were reserved for the public sector. This list was considerably expanded in the 1956 Resolution. Moreover, to further the objective of setting up "socialist pattern of society" it was felt that the public sector needed to occupy the commanding heights of the economy. The exclusive areas for the public sector in the 1956 Resolution included iron and steel, coal, transport, power, atomic energy, arms and ammunition, items of defence production etc. In other areas such as fertilisers, non-ferrous metals machine tools etc., they were expected to be progressively public owned. It is, therefore, clear that the planners viewed the state as an instrument which would initiate an industrial take off of the economy.

The public sector was expected to not only initiate development through public ownership of key areas but also to regulate investment in the private sector in line with plan priorities. This was done through the Industrial development and Regulation Act of 1951. The Act provided licensing as an instrument for channelling investment in socially desirable directions. The Act, through licensing, not only controlled entry of firms but also output mix, choice of technology, expansion of capacity, location and import content. While the objectives of the Act were to allocate investment in desired areas, to check the concentration of economic power, and to foster balanced regional development, in practice none of these objectives was achieved. This was obvious from the findings of Hazari (1967) and Dutt (Government of India, 1969) committees which were set up to investigate the working of the Act. Furthermore, detailed controls not only put a considerable strain on the administrative machinery but also led to delays in implementation.

Industrial controls were further augmented by additional controls in the form of Monopolies and Restrictive Trade Practices (MRTP) Act, 1970 and Foreign

Exchange Regulation Act (FERA), 1973. The objective of MRTP Act was to check the abuse of monopoly power. Monopoly power was defined in terms of aggregate assets as well as market dominance. The Act applied to those undertakings whose assets exceeded Rs. 200 million or to those whose market share exceeded one third. Undertakings which came under the purview of MRTP Act were required to take government approval in the following cases: (1) substantial expansion of capacity; (2) diversification of existing activities; (3) establishment of interconnected undertakings; (4) merger and amalgamation with any other undertaking; (5) appointment of directors of these undertakings on the board of directors of other undertakings. Under the FERA, foreign companies were required to dilute their equity holdings to 40% of the total equity of the company.

The above Acts controlled the entry of firms in the industrial sector. Exit was controlled by labour laws which made it impossible to close down a unit without government permission. Under the Industrial Disputes Act (1982 Amendment), it was not possible to retrench workers or to close down a unit employing 100 or more workers unless permitted by the government. Exit was further controlled by the application of urban land ceiling laws. The Urban land Ceiling and Regulation Act (ULCRA), 1976, ensured that many industries could not shift from the congested locations by disposing off their prime land. For example, many textile mills located in the heart of Delhi, Bombay etc. were not able to close down or shift location by selling off their lands and real estates because of this Act. With the freedom of entry and exit firmly controlled, Indian industry bade farewell to competition with disastrous consequences.

In the seventies it became obvious that the licensing system had outlived its utility as it was more of a regulatory and less of a developmental or promotional device. Based on the recommendations of the official committees, some partial liberalisation was attempted in late seventies and eighties. However, the changes were marginal in nature and only scratched the surface of the problem. The principle of intervention was not given up. For example, some industries were delicensed, some were broad-

banded to allow for greater flexibility in product mix, and in some automatic expansion of capacity was allowed; but licensing as an instrument was not given up.

3.1(e) Protection

It has been argued earlier that protection may be justified on infant industry grounds provided that it is for short term and compensates for the losses incurred during protection phase. In India, however, the argument of infant protection was never explicitly invoked by the planners. Had they explicitly stated this as the reason for protection they would have been forced to spell out the degree and phasing of protection as also the economic losses suffered during the infant phase. Unfortunately, this did not happen and protection was granted across the board in an indiscriminate manner.

The system of import controls and their debilitating consequences have been well documented by Bhagwati and Desai (1970) and Bhagwati and Srinivasan (1975). The import and exchange policy regime aimed at comprehensive direct control over foreign exchange utilisation. All uses of foreign exchange in the economy were decided by administrative decisions. In allocating foreign exchange two criteria were followed: the principle of 'essentiality' and the principle of 'indigenous non-availability'. An agency had to certify that imports were essential to the economy. At the same time, some other agency had to clear the imports if they were indigenously non-available. Thus in addition to licence issuing authority, there was a sponsoring agency certifying essentiality and a clearing agency for indigenous clearance. In addition to above requirements, public units had to obtain the permission of Department of Economic Affairs.

The import-allocation system virtually eliminated the possibility of competition, both domestic and foreign. Foreign competition was ruled out because of the principle of indigenous availability. Every item of indigenous production, whatever its cost or quality, was automatically shielded from competition through imports; the onus of proof being on the buyer to show that it was unavailable domestically.

At the same time, domestic competition was minimised by a combination of capital goods licensing (along with industrial licensing) and the method of actual user licensing on a "fair share" basis among rival firms in an industry. Strict capital goods and industrial licensing eliminated free entry by new firms as well as efficiency induced expansion by the existing firms. The fact that each firm was entitled to its share of actual licences and no more ensured that efficient firms could not enlarge output by competing away scarce imports from less efficient firms.

Under the principle of indigenous availability automatic protection was accorded to all industries regardless of cost, efficiency and comparative advantage. This automatic protection was further to be fully anticipated by every producer, merely as long as he was willing to make his capacity and production known to the relevant agencies in charge of indigenous clearance. The policy of anticipatory and automatic protection, as Bhagwati and Srinivasan (1975) note, "served to divorce market determined investment decisions from any guidelines that international opportunity costs...might have otherwise provided" (p. 46).

In India, the process of import substitution went well beyond the easy first stage. It was carried far into the second stage irrespective of comparative advantage or international cost of production. India thus found itself "travelling up the staircase." In many cases the size of the domestic market posed a constraint in reaping the economies of scale. Moreover, the emphasis on heavy industry made tall demands on sophisticated technology, skills, parts, components and accessories which were not easily available. Furthermore the rationale of infant industry protection was completely disregarded. As Ahluwalia (1985) notes:

"The rationale of infant industry argument would warrant that by the time industries come of age, protection would be withdrawn and industries would be exposed to foreign competition. Those industries in which India had comparative advantage would then compete successfully in the world markets. In fact not only infants, elderly incompetents were also protected from foreign competition. The result was a high-

cost industrial structure which could not operate except in a sheltered domestic market" (p. 114).

3.2 India's Import-Substitution Strategy: An Assessment

In this section we review the assessments to date of India's strategy of development. This will be done in terms of such performance indicators as growth, exports, import substitution, total factor productivity growth and poverty eradication.

3.2(a) Exports

The system of import substitution discriminated against exports. This has been analysed by various studies such as Bhagwati and Srinivasan (1975), Panchmukhi (1978), Wolf (1982) and Tandon Committee (Government of India, 1980). For example, Bhagwati and Srinivasan find that effective exchange rate for exports, on average, was less than effective exchange rate for imports. Tandon Committee on export strategy notes, "a trade regime in which there is a significant reliance on tariffs and licensing affords substantial effective protection to domestic producers in import competing lines while exports receive no comparable protection. In fact since this type of protection raises the general cost structure of industry, exports actually suffer from negative effective protection. This is an important bias in policy as compared to a neutral regime in which both export-oriented production and import-substituting production face the same degree of effective protection."

Bhagwati and Srinivasan (1975) also documented the unfavourable character of import-substitution regime to exports. They note that one of the important side effects of the principle of indigenous availability was that exportable items had to be manufactured with inferior quality domestically produced inputs and capital equipment. Thus they faced enhanced difficulties in competing in international markets, particularly in such items as engineering exports which had to be developed from scratch. Further, there was little flexibility in getting more inputs through bidding in the market and capacity could not be expanded owing to stringent controls on

entry. Industries which needed flexibility in production, in order to get hold of large foreign orders, found themselves unnecessarily handicapped. Thus Bhagwati and Srinivasan reach the conclusion that "the entire industrial licensing and import policy was unfavourable to manufacturing exports largely because it was devised with a substantially inward-looking bias" (p. 46).

Was export pessimism justified on the part of Indian planners? Was there a demand constraint on exports? Evidence for the sixties and seventies suggests that external demand was not a constraining factor for Indian exports. In the sixties and early seventies India's exports grew more slowly than world exports, leading to a continuous decline in India's share in world exports (Table 3.1). As Tandon committee notes, "it is particularly disturbing that India's share in world trade declined at a time when developing countries as a group were actually able to increase their share."

Manmohan Singh (1964), in a disaggregated study of India's exports, has shown that Indian exports were constrained by supply bottlenecks and not by demand. Had the planners thought of export promotion they would have looked to either cotton textiles or non-traditional manufactures. For cotton textiles, Mellor and Lele (1975) have shown that India's share as a proportion of LDC exports declined from 58% in 1953 to 8% in 1969. This happened at a time when Japan's textile exports increased manifold. As regards non-traditional exports are concerned, the evidence suggests that world demand was growing at a very fast rate. While India failed to utilise this opportunity, many developing countries were able to achieve high rates of export growth. Table 3.2 shows that Indian manufactured exports grew by 8.6% per annum and lagged far behind such exports from other developing countries during 1965-73.

That Indian exports were not hampered by inelastic demand is shown by a number of studies such as Lucas (1988) and Bhalla (1989). Lucas finds that for the eighteen groups of exports studied, six had price elasticity of greater than two, twelve had greater than one and only in one case (metal products), price elasticity was less than unity. Bhalla has also shown that price elasticities based on aggregate demand

function were high for non-petroleum exports (about 1.5) and even higher for manufactured exports.

Table 3.1
India's Share in World Exports
(1960-1977)

Year	Share in world exports	Share in world exports excl. minerals, fuel etc.	share in total exports of developing countries	share in exports of developing countries excl. 18 major oil exporters
1960	1.04	1.15	4.81	7.04
1965	0.90	1.00	4.62	6.90
1970	0.65	0.71	3.67	5.57
1971	0.58	0.65	3.28	5.43
1972	0.58	0.64	3.24	5.33
1973	0.51	0.57	2.64	4.43
1974	0.47	0.59	1.74	4.17
1975	0.50	0.62	2.10	4.83
1976	0.55	0.69	2.13	4.93
1977	0.48	-	1.92	6.25

Source: UN International Trade Statistics. Reproduced from Ahluwalia (1985)

Table 3.2
Manufactured Exports of developing Countries
(1965-1973)

Country	Compound growth rate (per cent per annum)
Argentina	31.3
Brazil	33.3
Hong Kong	21.4
India	8.6
Republic of Korea	50.3
Malaysia	22.6
Mexico	26.7
Singapore	23.2
Yugoslavia	15.2

Source: Keesing and Plesch (1978). Reproduced from Ahluwalia (1985).

In the light of above evidence, it can be concluded that India's poor export performance had more to do with its policies and less to do with external demand conditions. As a result, it was hard to justify India's continued export pessimism and inward orientation.

3.2(b) Slowdown in Import Substitution

Import substitution can be measured by calculating imports to availability ratio (where availability is defined as domestic production plus imports) for various groups of industries. A decline in the import-availability ratio represents import substitution. Ahluwalia (1985) finds that there was a slow down in import substitution after the mid sixties in India. This is shown in Table 3.3. From 1959-60 to 1965-66, the import-availability ratios declined across the board for various industry groups indicating an increase in import substitution. This conforms to the fact that during the initial phase of import substitution easy opportunities are utilised leading to fast import substitution. After 1965-66 many ratios increased showing that import substitution slowed down in these industries once the easy opportunities were exhausted. It is important to note that the increase in import-availability ratios since the mid sixties is not across the board. But for the manufacturing total ratio shows an increase indicating that import substitution as a whole became difficult. This result is on expected lines since continued import substitution involves "travelling up the staircase", as already noted.

Ahluwalia (1985) finds nothing surprising about the above results since the same process of slowing down of import substitution also took place in many other developing economies. In her words: "Indeed some of the relatively fast growing developing economies such as Korea, Singapore and Taiwan have also gone through the initial phase of import substitution and subsequent slowdown without a deterioration in performance. The slowing of import substitution in these economies has been accompanied by a rapid growth of exports. If the experience of India has been any different, the explanation must lie elsewhere, for example, in the inefficient

nature of import substitution which, along with a number of other factors, fostered the development of high-cost industrial structure" (p. 126).

Table 3.3
Import Availability Ratios
Two Digit Industry Groups
(per cent)

Code	Industry group	share in value added	1959-60	1965-66	1979-80
20	Food, except beverages	9.0	4.2	2.9	8.1
21	Beverages	0.8	15.8	7.5	0.7
22	Tobacco	2.5	1.5	0.9	-
23	Textiles	20.2	2.9	1.3	1.9
24	Footwear etc.	0.4	-	-	-
25	wood and cork	0.6	22.1	4.5	2.9
26	Furniture and fixtures	0.5	0.9	0.4	0.2
27	Paper and paper products	2.6	23.4	17.1	18.2
28	Printing and publishing	2.5	-	-	-
29	Leather and fur products	0.4	5.4	4.6	0.1
30	Rubber products	2.5	11.5	3.5	8.1
31	Chemical and chemical products	12.4	30.0	17.0	19.5
32	Petroleum products	1.8	43.9	27.8	42.3
33	Non-metallic mineral products	3.8	6.5	2.2	22.7
34	Basic metals	9.6	32.3	22.2	22.7
35	Metal products	3.2	23.4	6.8	6.9
36	Non electrical machinery	6.5	65.8	56.3	30.6
37	Electrical machinery	6.1	38.1	27.7	9.9
38	Transport equipment	8.2	25.7	15.8	11.1
39	Miscellaneous	6.3	18.8	15.6	16.7
	Manufacturing total	100	18.1	14.7	17.3

Source: Ahluwalia (1985)

3.2(c) Growth

India's growth performance in the first three decades of planning has been widely commented upon. If the performance is compared with the stagnation under the British rule, it certainly looks impressive. However, if it is compared with the super performers of East Asia such as Taiwan, Korea and Singapore, the record looks dismal.

Table 3.4
GDP Growth, Investment Rate and Incremental Capital Output Ratio (ICOR) in India

Period	Growth of GDP (%) (1)	Investment Rate (%) (2)	ICOR (2)/(1)
1951-56	3.61	10.66	2.95
1956-61	4.27	14.52	3.40
1961-66	2.84	15.45	5.44
1966-71	4.66	15.99	3.43
1971-76	3.08	17.87	5.80
1976-81	3.24	21.47	6.63
1981-86	5.06	20.98	4.15
1985-90	5.81	22.70	3.91
1992-97	6.8	25.7	

Sources: (1) Eighth Five-Year Plan, 1992-97
(2) Economic Survey, 1997-98

Table 3.5
Annual Compound Growth Rates of NNP Per Capita (1980-81 prices)

First Plan (1951-56)	1.7
Second Plan (1956-61)	1.9
Third Plan (1961-66)	0.1
Annual Plans (1966-69)	1.4
Fourth Plan (1969-74)	0.9
Fifth Plan (1974-79)	2.6
Annual Plan (1979-80)	-8.2
Sixth Plan (1980-85)	3.2
Seventh Plan (1985-90)	3.6
Eighth Plan (1992-97)	4.7

Source: Economic Survey, various issues.

Table 3.4 shows that the growth rate of GDP hovered around 3.5% per year for the first three decades of Indian Planning. It was only in the 1980s that a clear break from this growth rate was observed. The growth rate in the eighties was around 5.5% per annum. The same trend is observed if we look at national income per capita. During the first five plans it grew by 1.7, 1.9, 0.1, 0.9 and 2.6 per cent respectively. It was in the eighties that per capita income grew faster at 3.2 and 3.6 per cent per annum during the sixth and seventh plans respectively. Trends in per capita income are given in Table 3.5. It is clear that growth of national income as well as per capita income

showed an acceleration in the eighties when partial liberalisation of the economy was attempted.

The finances needed for development were raised mainly through domestic savings which contributed about 90 to 95 per cent of investment in different periods in the first seven plans. The rate of savings increased from an average of 10.3 per cent of GDP during 1951-56 to 21.7% during 1976-81, as shown in Table 3.6. It, however, declined in the eighties averaging around 20 per cent. Household sector was the largest contributor to domestic savings, with its share rising over the years. On the whole, the performance of Indian savings rate has been good as compared to many other developing countries with comparable per capita incomes.

Table 3.6
Rates of Savings in India (% of GDP)

Period	Household sector	Private corporate sector	Public sector	All sectors
1951-56	7.57	1.03	1.68	10.28
1956-61	8.59	1.21	1.93	11.73
1961-66	8.37	1.71	3.13	13.21
1966-71	10.64	1.31	2.40	14.35
1971-76	12.40	1.64	3.24	17.27
1976-81	15.71	1.61	4.32	21.65
1981-86	14.02	1.69	3.65	19.36
1985-90	16.01	2.03	2.34	20.37
1992-97	18.2	3.7	1.4	23.3

Sources: (1) Eighth Five-Year Plan, 1992-97
(2) Economic Survey, 1998-99

A rising saving rate sustained a rising rate of investment. The rate of investment increased from 10.7% of GDP in 1951-56 to 22.7% in 1985-90 (Table 3.4). The biggest rate of increase in investment occurred in the public sector. The share of public sector increased from 27% in 1950-51 to over 46% in the seventh plan. However, the growth rate of the economy was not commensurate with the rising levels of investment and saving in the first three decades of planning. The capital-output ratio was increasing (Table 3.4). The rising incremental capital-output ratio was partly due to shift in the composition of investment to heavy industries and partly

due to inefficiency in the use of resources. The inefficient resource use was the direct outcome of trade and industrial policies pursued by the government.

Commenting upon the Indian growth performance Bhagwati (1993) observes, "the weak growth performance reflects, not a disappointing saving performance, but rather a disappointing productivity performance." He gives three broad reasons for low productivity performance: (i) extensive bureaucratic controls over production and trade; (ii) inward-looking trade and investment policies; and (iii) a substantial public sector going well beyond the conventional confines of public utilities and infrastructure.

Referring to Weiner (1991), Bhagwati (1993) adds another factor to the above list, namely, India's failure to spread primary education and to raise literacy to anywhere near the levels that many other countries have managed. Thus, while India achieved a literacy rate of 40.8% for people aged 15 or above in 1990, super performers of the East did much better with 91.2% for Taiwan, 90% for Korea and 88.7% for Philippines.

3.2(d) Total Factor Productivity Growth (TFPG)

Role of total factor productivity growth or technical progress was first analysed by Solow (1957). Output growth can be decomposed into contribution by factor inputs and contribution by efficient use of inputs (or TFPG). This is obtained as a residual after taking away the growth of factor inputs from growth of output. It is important to mention that since TFPG is derived as a residual, it reflects the effect of errors in the measurement of capital and labour. Further, any improvement in the quality of labour or increase in capacity utilisation gets reflected in improved TFPG. Due to these reasons, TFPG can be taken to measure the growth of overall efficiency with which factors are combined rather than pure technical progress.

Ahluwalia (1985, 1991) has presented evidence to show that TFPG performance in the Indian manufacturing sector was poor during the period 1959-80, with Solow

index declining by 0.6% per annum and Translog index by 0.4% per annum. At the disaggregated level, the decline in TFPG is shown in Table 3.7. Comparing the Indian performance with that of other countries, Ahluwalia (1985) observes: "Total factor productivity in manufacturing increased at the rate of 5.7, 2, 0.8 and 3.1 per cent per annum in Korea, Turkey, Yugoslavia and Japan respectively, while it declined in India at a rate anywhere between 0.2 to 1.3 per cent per annum for Indian manufacturing" (p. 135).

Table 3.7
Total Factor Productivity Growth Estimates
Two Digit Industry Groups
(1959-60 to 1979-80)
Per cent per annum

Code	Industry group	Solow	Translog
20	Food, except beverages	-2.7	-3.6
21	Beverages	-1.4	-3.1
22	Tobacco	-1.4	-3.6
23	Textiles	1.1	1.0
24	Footwear, etc.	3.0	0.7
25	Wood and cork	-2.7	-3.0
26	Furniture and fixtures	2.2	2.1
27	Paper and paper products	0.5	0.1
28	Printing and publishing	0.8	0.5
29	Leather and fur products	-1.9	-2.4
30	Rubber products	-6.7	-5.5
31	Chemical and chemical products	-1.3	-1.3
32	Petroleum products	-5.4	-5.6
33	Non-metallic mineral products	-1.1	-1.2
34	Basic metals	-0.1	-0.9
35	Metal products	-2.5	-2.2
36	Non-electrical machinery	-1.6	-1.1
37	electrical machinery	-0.5	-0.2
38	Transport equipment	-	0.1
39	Miscellaneous	-6.5	-5.1
	Manufacturing total	-0.6	-0.4

Source: Ahluwalia (1985)

TFPG performance of the Indian manufacturing improved in the 1980s when the economy was partially liberalised. Ahluwalia (1991) shows that while TFPG during 1959-80 declined by 0.4% for Indian manufacturing, it improved dramatically to 3.4% during 1980-86. This is broadly in line with the trend in ICOR which rises till 1980-

81, and thereafter shows a declining trend signifying better use of resources (Table 3.4). From a peak of 6.6 during 1976-81, ICOR gradually declined to 3.9 during the eighth plan (1992-97).

Data presented here indicate that poor growth performance of the Indian economy in the first three decades of planning was due to inefficient import-substitution strategy followed. This is corroborated by the rising ICOR and poor TFPG performance. In the 1980s when some liberalisation was attempted the performance in terms of GDP growth and TFPG improved. ICOR also showed a declining trend during this period.

Some cross-section studies have tried to formally study the impact of protection and import substitution on total factor productivity growth in a multiple-regression framework. Goldar (1986), in a study using a sample of 20 industry groups, found a negative relationship between total factor productivity growth and effective rate of protection (ERP), although the coefficient of ERP was not significant. Goldar (1986a) found a significant negative relationship between total factor productivity growth and the extent of import substitution. Similarly, Ahluwalia (1991) also finds that higher the degree of import substitution in an industry, the lower is its rate of productivity growth.

3.2(e) poverty

India's import-substitution strategy not only produced low growth but also seriously handicapped the alleviation of poverty in India. With the rate of growth of about 3.5% per annum till the end of the seventies, there was hardly any trickle-down impact. Had the growth rate been higher (at say 6-7% per cent per annum) it would have made a significant dent in poverty. Weiner (1986) has pointed out had India's growth rate been as fast as South Korea's during 1960-80, India's GDP would have surpassed that of UK, equalled that of France and would have been more than twice that of China. Even if the benefits of growth were inequitably distributed, most of India's poor would have been substantially better off.

Substantial evidence exists to suggest that growth has an impact on poverty. Minhas (1970) has shown that incidence of poverty is linked with the performance of the agriculture sector; incidence of poverty increases in years of bad harvests and goes down in years of good harvests. Similarly, Ahluwalia (1978, 1985) finds that agricultural growth at an aggregated all India level reduces poverty. The finding that agriculture growth and poverty are linked were reconfirmed by Mathur (1985).

India's import-substitution policies discriminated against agriculture sector in a number of ways. Firstly, high protection to industry implied that industrial activity was more profitable than agricultural pursuits. Protectionist industrial and trade policies had the effect of turning the terms of trade against the agriculture sector. To counter this, a regime of low input prices was followed by subsidising agricultural inputs such as fertilisers, irrigation, diesel and credit. At the same time, output prices were also kept low to check the rate of inflation. The output prices were kept low by banning export of most agricultural items (to improve their domestic availability) and also by providing food subsidy to the consumers through the public distribution system. Inter-state restrictions on movement of agricultural produce as well as restrictions on holding stocks of these items also ensured low prices in the producing states. On balance, however, agriculture sector was disprotected in the sense that the domestic prices were lower than the world prices. According to Parikh (1997) "disprotection rates (defined as the excess of world prices over domestic prices) were as high as 34 per cent for rice, 30 per cent for protein feeds and 12% for wheat" (p. 1149). Parikh also mentions a World bank estimate which puts the overall disprotection rate at 30 per cent during the period 1970-84.

With agriculture sector facing disprotection, its potential to grow faster, to create more employment and to reduce rural poverty could not be fully realised. Emphasis on heavy industry in the Indian planning process also meant that fewer resources were available for the agriculture sector. The net result of India's strategy of development was that even by the end of the eighties there was substantial poverty. According to the Indian Planning Commission estimate, there were 321 million poor people in 1973-74. This number roughly remained the same at 320 million in 1993-94. Even

after two decades the absolute number of poor people did not come down! Had India followed an outward-orientated strategy the resulting growth rate would have been much higher; agriculture and exports would not have faced discrimination; and India's record on poverty alleviation would have been perhaps much better.

3.3 India's Trade Liberalisation Since 1991

Prior to the 1980s, India operated a trade regime characterised by quantitative restrictions through the instrument of import licensing. Consumer goods imports were generally banned and the import of raw materials, intermediates and capital goods were subject to highly discretionary import licensing. Import of essential items such as edible oils, foodgrains, kerosene oil and sugar was permitted through the official canalising agencies to overcome domestic shortages.

During the 1980s some liberalisation in import licensing was attempted. Imports of many intermediate goods were put on Open General license (OGL) which meant that these items could be imported without any license. The import of capital goods was also made easier by applying the discretionary licensing regime in a more flexible manner so that technological upgradation could be encouraged. The exchange rate policy was also operated in a more flexible manner. However, these partial liberalisation measures were accompanied by higher tariffs, which might have offset any significant reduction in protective effect. Higher tariffs combined with the prevailing quantitative restrictions probably produced an exchange rate that was overvalued compared to a situation that might have prevailed with lower tariffs.

India's partial attempts at liberalisation in the 1980s succeeded in raising India's growth rate of GDP to about 5.5% per annum, a clear break from the earlier trend of 3.5%. The productivity performance of the organised manufacturing sector, as noted above, also shot up from -0.4% per annum during 1959-80 to 3.4% per annum during 1980-86. However, the policies of eighties were unsustainable since they involved large fiscal and current account deficits, overvalued exchange rate, high inflation and large internal and external debts. The root cause of the crisis was large fiscal deficits

in the 1980s which continued at unsustainable levels throughout this period. The gross fiscal deficit, which rose from 4.1 per cent of GDP in 1975-76 to 6.2 per cent in 1980-81, reached a peak of 8.4 per cent by 1990-91. The internal crisis snowballed into a severe BOP crisis by the end of the eighties.

The macroeconomic crisis, which kept on brewing throughout the 1980s, needed an immediate trigger. This was provided by the Gulf war when oil prices shot up. In 1991 when the new government took office, it was faced with an unprecedented foreign exchange crisis. The reserves fell to less than $1 billion, a level barely enough for two weeks of imports. International credit rating agencies downgraded India's credit rating and international community's confidence in India's ability to manage its economy was severely eroded. It became evident that there was no alternative but to go to the IMF for a loan.

It also became evident that the economy suffered from a malady arising out of its strong inward orientation. In the wake of the 1991 crisis, surgical operation of the economy became necessary involving stabilisation and structural adjustment programmes. The disease could not be removed by the cosmetic changes of liberalisation attempted in the late seventies and eighties. A clear break from the past was required to put the economy on a more sustainable footing.

India's response to the crisis was to embark upon a set of far reaching reforms. The reforms were comprehensive and involved various aspects of economic life such as trade and exchange rate, industry, monetary and fiscal policies, financial sector and foreign investment rules. It is important to realise that trade and exchange rate reforms were not undertaken in isolation but were a part of a comprehensive package. The reforms are still continuing and are far from complete. In this section we shall outline the reforms undertaken in trade and exchange rate policies and the impact they created on the economy.

As a first measure, a two-step devaluation of the Indian Rupee was carried out in 1991. This was followed by a series of other measures like the introduction of

incentive licensing in the form of eximscrips, dual exchange rate system on trade account followed by unification of the exchange rate or full convertibility on trade account. Ultimately, the Rupee was made convertible on current account in August 1994. As a result, India attained Article VIII status of the IMF which stipulates that members should have no restrictions on current payments and should also avoid discriminatory practices including multiple exchange rates. The exchange rate of the Rupee was henceforth determined by demand and supply conditions in the foreign-exchange market.

Apart from the exchange reforms, important reforms in trade policies were also attempted. They were:

(a) Along with the devaluation of the Rupee, export subsidy in the form of cash compensatory support was also withdrawn.

(b) Import controls through licensing have largely been removed except some consumer goods and agricultural commodities. All other items like capital goods, raw materials, intermediates etc. can freely be imported subject only to custom duties.

(c) Import duties have been removed in stages with the peak rate coming down to 150% in 1991, 110% in 1992, 85% in 1993, 65% in 1994, 50% in 1995, 40% in 1997 and 35% in 2000. Duties on capital goods, machine tools and project imports have been reduced to 25%.

(d) Import of gold and silver has been considerably liberalised to reduce the incentive to smuggle these items.

(e) Although import of some consumer goods remains restricted, their import is allowed through indirect routes. For example, baggage rules have been considerably liberalised; and as an incentive to exporters, import of consumer goods is allowed under special import licences which fetch premium in the market.

(f) Rationalisation of the tariff structure has been carried out involving reduction in the number of rates; reduction in anomalies caused by import duties on raw materials and components being higher than on finished products; unification of the rates on similar products; and major pruning of notifications and end use exemptions.

(g) Many restrictions on the export of agricultural commodities have been removed. Now the position is that except for cereals, all other items of agricultural production have been freed from export restrictions.

(h) The Export-Import Policy announced on 31st March 2000, freed 714 consumer goods and agricultural items from quatitative restrictions. The remaining 715 items would be freed by March, 2001. These quatitative restrictions were allowed under the WTO rules to only those countries that faced a balance of payments problem. Based on the WTO ruling and subsequent consultations with the US, a major trading partner of India, these restrictions are required to be totally phased out by March, 2001.

Concomitantly, foreign investment rules have also been liberalised to reduce the reliance on debt:

(a) To start with, foreign investment approval up to 51% of equity in a specified list of priority industries was made automatic, subject only to a registration procedure with the Reserve Bank of India. This list of automatic approval has been considerably expanded in recent years and equity cap for automatic approval in some sectors is 74% and even goes upto 100% for some areas.

(b) Investment not covered by the automatic procedure was permitted on the basis of case by case approvals given by especially constituted Foreign Investment Promotion Board (FIPB).

(c) The procedure for Indian companies to invest abroad and develop global linkages was also streamlined and made easier. Companies were also allowed to list on foreign stock exchanges.

(d) The Foreign Exchange Regulation Act (FERA) was also amended to make it easier for foreign firms holding equity in India to operate and also to make it easier for Indian businesses to operate abroad. This Act has now been replaced with a liberal Foreign Exchange Management Act (FEMA).

(e) India became a signatory to Multilateral Investment Guarantee Agency (MIGA) convention to signal that foreign investment was welcome.

What then has been the impact of the trade liberalisation attempted since 1991? The first impact was to reduce the degree of protection in India. In 1990-91, a year before

the reforms, Indian tariff levels were among the highest in the world. Table 3.8 shows that the average nominal tariff for the economy as a whole was 128 percent in 1990-91; ranging from 142 per cent for consumer goods to 106 per cent for agricultural products. The import-weighted tariff rate was 87 per cent for the economy; ranging from 164 per cent for consumer goods to 70 per cent for agricultural products. By 1995-96, the average tariff rate for the whole economy fell down to 42 per cent and import-weighted tariff to 27 per cent.

Table 3.8: Tariff Structure (%)

Mean					
	1990-91	1992-93	1993-94	1994-95	1995-96
whole economy	128 (41)	94 (34)	71 (30)	55 (25)	42 (21)
agricultural products	106 (48)	59 (49)	39 (39)	31 (30)	26 (21)
mining	-	-	71 (24)	48 (25)	37 (18)
consumer goods	142 (33)	92 (42)	76 (36)	59 (33)	43 (21)
intermediates	133 (42)	104 (25)	77 (22)	59 (17)	45 (15)
capital goods	109 (32)	86 (26)	58 (24)	42 (20)	35 (13)
Import-weighted average					
whole economy	87	64	47	33	27
agricultural products	70	30	25	17	15
mining	-	-	33	31	30
consumer goods	164	144	33	48	39
intermediates	117	55	40	31	24
capital goods	97	76	50	38	30

Notes: (1) standard deviations are in parentheses
(2) in 1990-91 and 1992-93, mining is included in intermediates
Source: Ministry of Finance, Government of India and World Bank. Reproduced from Ahluwalia (1996).

The distortion due to tariff is not only caused by higher average protection but also by dispersion of various rates. The table shows that not only did the average tariff come down, the dispersion, as measured by the standard deviation, also came down from 41 per cent in 1990-91 to 21 per cent in 1995-96. In 1995-96, the dispersion in rate was the highest for agricultural products and consumer goods (21%) and the lowest for capital goods (13%). However, as compared to other developing countries such as Korea, Indonesia, Brazil and Mexico, Indian rates are still much too high.

The tariff data understate or overstate the extent of protection in several ways. For example, since consumer and agricultural products are subject to quantitative

restrictions, the above rates understate the extent of protection. On the other hand, because of numerous exemptions and concessions to exporters and others, the extent of protection is overstated. To take account of such factors one can measure import duty collection rate which is calculated as import duties as a percentage of import value. The data on collection rates is shown in Table 3.9. It can be seen that collection rate for the economy as a whole came down from 47 per cent in 1990-91 to 27 per cent in 1997-98. Even then, Indian collection rates continue to be much higher than many Asian and Latin American countries.

Data on the Real Effective exchange Rate (REER) show that during 1991-92 and 1992-93, the first two years of the reforms, REER declined making Indian exports more competitive in international markets. Thereafter, REER continued to fluctuate, with level in 1997-98 being roughly the same as 1991-92. If 1992-93 is regarded as the reference point, REER in 1997-98 shows an appreciation of 9.5% if measured in terms of a 5-country index and 11.4% if ten-country index is used (Table 3.10). The upward pressure on REER is probably on account of sharp increase in foreign capital inflows, both in portfolio investment and direct investment.

Table 3.9: Collection rates for selected import groups

	1990-91	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
food products	47	12	19	22	23	19	30
POL	34	31	36	31	30	32	29
chemicals	92	71	52	44	44	49	37
man made fibres	83	45	18	18	36	36	36
paper & newsprint	24	18	13	11	8	11	13
natural fibres	20	20	14	9	12	13	17
metals	95	97	69	53	52	45	44
capital goods	60	53	31	38	33	39	41
others	20	13	10	11	13	14	14
non POL	51	39	28	29	28	31	27
total	47	37	30	29	29	31	27

Source: Economic Survey, various issues.

Table 3.10: Nominal and real effective exchange rate of rupee (1990=100)				
year	NEER		REER	
	5-country index	10-country index	5-country index	10-country index
1991-92	71.70	72.31	82.00	82.42
1992-93	59.16	59.60	74.39	74.58
1993-94	54.91	56.55	73.96	75.58
1994-95	52.97	54.23	78.34	79.42
1995-96	48.61	49.43	75.88	76.32
1996-97	47.67	48.43	78.31	78.69
1997-98	47.35	49.01	81.44	83.07

Source: Economic Survey, 1998-99

Performance of the Indian economy in terms of key macroeconomic indicators after the reforms is summarised in Table 3.11. It appears that the Indian economy has substantially recovered from the crisis of 1991. The following features of this change are worth noting:

(1) The growth rate of GDP (at factor cost) had fallen to less than one percent in 1991-92. The rate recovered in the subsequent two years to 5.4% and 4.8% respectively, and then accelerated to more than 7% during the three year period 1994-97. During the eighth five year plan (1992-97) the Indian economy averaged a growth rate of 6.5% per annum which is well above 3.7% achieved in the first three decades of planning (1950-79) and 5.9% achieved during the eighties.

(2) Industrial growth had collapsed to about half of one per cent in 1991-92. This quickly recovered in the subsequent years and the industrial sector grew by more than 12% during 1995-96. During the eighth plan (1992-97) the average industrial growth rate was 8% as compared to 7.5% during the seventh plan (1985-90), while the manufacturing sector grew by 9.2% as compared to 7.7% in the earlier plan.

(3) Agriculture sector, which experienced a negative growth rate of 2% in 1991-92, quickly recovered with the growth rate peaking at 9.3% in 1996-97. On an average agriculture sector grew by about 4% during the eighth plan as compared to 3.4% in the earlier plan.

(4) There has been a remarkable improvement in the balance of payment situation. Exports in dollar terms had fallen by 1.1% during 1991-92. During the three-year period 1993-96 exports, on an average, increased by more than 20% in dollar terms.

Imports have also risen but the balance of payment position appears comfortable with current account deficit well within control.

Table 3.11
Macroeconomic Indicators

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
GDP growth at factor cost (1980-81 prices)	5.7	0.4	5.4	4.8	7.8	7.2	7.5	5.0
Industrial growth	8.3	0.6	2.3	4.1	9.4	12.1	7.1	4.2
Agricultural growth	3.0	-2.0	4.1	2.2	5.0	-2.7	9.3	-3.7
Inflation (WPI index)	12.1	13.6	7.0	10.8	10.4	5.0	6.9	5.0
Fiscal deficit (% of GDP)	8.3	5.9	5.7	7.4	6.0	5.4	5.2	6.1
Imports ($ mn.)	27915	21064	24316	26739	35904	43670	48948	51126
Exports ($ mn.)	18477	18266	18869	22683	26855	32311	34133	34849
Trade deficit ($ mn.)	9438	2798	5447	4056	9049	11359	14815	16277
Current account deficit ($ mn.)	9680	1178	3526	1158	3369	5899	4494	6473
As a % of GDP	3.2	0.3	1.7	0.4	1.0	1.6	1.1	1.6
Exports as a % of imports	66.2	86.7	77.6	84.8	74.8	74.0	69.7	68.2
Foreign currency assets ($ mn.)	2236	5631	6434	15068	20809	17044	22367	33980
Debt service as a % of current receipts)	35.3	30.2	27.5	25.6	26.2	24.3	21.2	19.5
Export growth	9.0	-1.1	3.3	20.2	18.4	20.3	5.6	2.1
Import growth	14.4	-24.5	15.4	10.0	34.3	21.6	12.1	4.4
Exports/GDP(%)	6.2	6.7	7.1	8.1	8.1	8.9	8.6	8.3
Imports/GDP(%)	9.4	7.7	9.4	9.6	10.9	12.0	12.3	12.2
Trade deficit/GDP(%)	3.2	1.0	2.2	1.5	2.7	3.1	3.7	3.9
Trade/GDP	15.6	14.4	16.5	17.7	18.9	20.9	20.9	20.5

Source: Economic Survey, various issues.

(5) There were fears that trade policy changes would generate disruptive flood of imports and weaken the economy. However, these fears have turned out to be unfounded. Liberalisation and openness have actually led to greater self reliance. Exports in 1993-94 financed 85% of imports as compared to 69.5% in 1989-90 and 55% in 1985-86.

(6) The current account deficit which was over 3% of GDP in 1990-91 declined to 0.4% in 1993-94 and 1.6% or less thereafter.

(7) Debt service as a proportion of current receipts, which reached a level of 35.3% in 1991-92, almost halved to 19.5% in 1997-98.

(8) Foreign investment, which was a paltry sum of $133 million during 1991-92, has significantly increased since then and crossed the $6 billion mark during 1996-97. FDI component of this investment has also steadily increased from $129 million to $3197 million over the same years (Table 3.12).

(9) Foreign currency assets which at one point had declined to $1 billion in 1991 reached a comfortable level of about $34 billion at the end of 1997-98.

(10) Inflation rate (in terms of wholesale price index), which had peaked to 13.6% in 1991-92, came down since then and was 5% during 1997-98.

(11) Saving and investment performance of the economy has also improved. Saving and investment ratios (Tables 3.4 and 3.6) were 23.3% and 25.7% during the eighth plan (1992-97) as compared to 20.4% and 22.7% during the seventh plan (1985-90).

Table 3.12
Foreign Investment Flows in India ($ mn.)

	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
Direct investment	129	315	586	1314	2133	2696	3197
Portfolio inv.	4	244	3567	824	2748	3312	1601
Total	133	559	4153	5138	4881	6008	4798

Source: Economic Survey, 1997-98

Apart from above, information technology industry has become a major growth area after the reforms. Software exports, which started from almost scratch in 1990-91, have been reported to have reached $4 billion in 1999-2000. These exports are growing at a very fast rate of anything between 50-60% per annum in dollar terms and

by 2008 are slated to reach a level of $50 billions. The growth of this sector is based on the abundant availability of computer skills, lower wage costs and low training costs to produce the required skills.

Reforms since 1991 have been variously appraised by different authors. Parikh (1997) is of the view that the Indian economy is on the verge of a take-off and that "India can join the super league of high growth east Asian economies if India continues on the path of policy reform" (p. 1143). According to him, growth process of 1990s is more sustainable than that seen in the 1980s because (1) monetisation of government debt is limited by the ceiling agreed to with the Reserve Bank of India; (2) though not entirely satisfactory, the government has succeeded in reducing fiscal deficit to some extent; and (3) foreign direct investment is becoming a major component of foreign capital inflow. These factors make for a more sustainable way of financing investment as compared to the 1980s when fiscal deficits were financed by large debt flows, both internal and external.

Indian economy has many inherent strengths and these have the capability to make the future prospects bright. In his words: "India has many advantages: a highly skilled labour force, English as a national language, a large growing middle class, a legal framework based on independent judiciary and a stable administrative set up. These advantages should attract foreign savings into India. This should make it possible to invest at increasing rates and hence accelerate the economy further. The prospects for a fast growing Indian economy are bright indeed" (p. 1143).

Similarly, Ahluwalia (1996) finds that on the whole, India's opening thus far has been significant and the initial results have been positive. In her words: "The opening of the Indian economy to foreign trade and investment has generated fundamental changes in the price incentives facing the tradable goods sector and, within it, those facing exports vis a vis import substitutes. Businessmen increasingly see these changes - and the reforms - as irreversible" (p. 32).

Bhagwati (1993) highlights two features of the current reforms that distinguish them from the earlier episodes and make them more credible and sustainable. First, the reforms are forceful and explicit. The direction is clearly set and there is no ambiguity of intention. Second the reforms are being unfolded continuously that gives them a momentum as well as keeps the opposition off balance. In his words: "... the reforms have moved over a number of areas, in rapid succession, and are also poised to enter new areas admittedly of greater difficulty" (p. 85).

After analysing the growth process in the post reforms phase, Virmani (1997) concludes: "Sectoral analysis of economic performance demonstrates that growth has accelerated where reforms have been most extensive and has regressed where they have been slow...The deteriorated performance of non-tradable services has slowed overall growth and is a major and increasing cause of higher inflation...A sustained growth of 7 to 8 per cent in not only possible but also essential to achieve rapid reduction in poverty" (p. 2067).

There are dissenting voices as well. For example, Ghosh (1997) feels that after the initial period of stabilisation the direction of policy has undergone significant changes which are harmful for the Indian economy. The change in direction has taken the following forms: (a) the gradual withdrawal of the state from economic activities, even to the point of neglect of infrastructure build-up as also the public funding of social development in areas of education and elementary health care; (b) the encouragement of private investment, and increasing reliance on external private capital, for economic development, including the build-up of infrastructure facilities essential for development; (c) the gradual privatisation of public enterprises, following systematic disinformation in regard to its functioning and its problems, even while paying lip service to the importance and reform of the public sector; and (d) in order to attract external capital, the introduction of fiscal and monetary policies that tend to pass on control over the overall direction of economic policies from the Indian state to external capital, with seriously deleterious consequences to the Indian people.

In his concluding remarks he makes three points. First, stabilisation under the IMF conditionality has now been dispensed with the structural adjustment programme 'dictated by the World Bank'. Secondly, foreign capital can never replace domestic savings for the build up of infrastructure. Finally, although the foreign reserve position seems comfortable, external sector has two major weaknesses: (a) deficit on trade account is widening, and (b) reserves have been built up because of large inflow of short-term capital. Therefore, the conclusion reached is that "in no sector or manner the new economic policy succeeded; and if short-term capital keeps coming in, it is partly because of the extortionate interest rates paid by India to foreign lenders; and because it enables the foreign institutional investors to get a stranglehold over vital Indian public sector enterprises at a cheap price" (p. 1139).

Despite the criticisms of the reforms process cited above, it cannot be denied that the reforms have put India on a higher growth path and suddenly growth rates of 7-8% per annum seem attainable if India continues on the path of policy reform. The reform process has unleashed the inherent strengths of the economy that were unknown before. For example, starting from scratch, software exports are growing at the rate of 50-60% per annum in dollar terms and by 2008 are slated to touch the magical figure of $50 billion. Pharmaceuticals sector is another growth area, and if product patent regime is sorted out in this area, unprecedented growth forces can be unleashed. Similarly, entertainment sector is also poised for exponential growth.

The growth process seems more sustainable now as there is a limit to monetisation of fiscal deficit and foreign investment as a proportion of foreign capital inflow is increasing. The only fly in the ointment appears to be the sorry state of infrastructure in India. To sort it out, India requires more policy reform, not less. Although trade deficit is widening, this should not cause alarm, as one way of utilising the foreign investment inflows for the development of the economy is to run a trade deficit. Moreover, because of large inflows of private transfers, current account deficit is within reasonable limit of 1.6% of GDP (in 1997-98). Therefore, the above criticisms by Ghosh do not appear to be based on the facts of the situation.

3.4 Conclusion

From the foregoing analysis it appears that India's economic performance is very closely linked to its trade orientation. In the first three decades of planning, India followed an extremely inward-oriented approach, as a result of which India's growth performance was lacklustre. In the 1980s, and more so in the 1990s, when liberal economic policies were followed, India's growth rate picked up considerably. The foregoing analysis also seems to suggest that the governmental intervention was excessive and amounted to what is generally known as 'governmental failure'.

Does one, then, conclude that planning in India was a dismal failure? The fact is that Indian planning was neither an unqualified success nor a dismal failure. The truth would lie somewhere in between these two extreme positions. There are many things that can be said in favour Indian planning and its achievements cannot be dismissed so lightly. Firstly, the broad approach followed by India was in line with mainstream economic thinking at that time. After all, no country, except UK and more recently Hong Kong, has industrialised without protecting its industries. Latecomers like USA and Germany are good examples of industrialisation behind tariff walls. The argument for infant protection was developed in Germany which found it difficult to compete with the more established industry in UK. If India went in for inward orientation in its policy framework, it cannot be regarded as entirely abnormal given the state of development thinking as well as the lack of examples of industrialisation under free trade.

Secondly, state intervention is justified if there is widespread 'market failure'. For example, if the provision of things like education, technical skills, health and infrastructure is left entirely to the market forces, the outcome would be less than optimal. Moreover, market underprovides for the needs for the future generations, as present consumption is valued more than the future consumption; consequently, market determined rates of saving and investment may be less than optimal. Therefore, the state may be justified in intervening to provide for public utilities as well as to push up the rates of saving and investment. To the extent that India used

state intervention to achieve these ends in mind, India could be given the benefit of doubt.

Finally, Indian planning did succeed in achieving some successes like setting up a fairly well diversified industrial base, establishing a large pool of scientific and technical manpower, a moderate rate of economic and industrial growth, pushing up the rate of saving and investment from 10% of GDP in the early fifties to 23-24% now, a near self sufficiency in foodgrain production, and the ability to contain the inflation rate to reasonable levels (in comparison to those prevailing elsewhere, for example in Latin America).

Where did India go wrong? Was the Indian strategy of import substitution wrong? It can be argued that it was not import substitution per se but the extreme form of import substitution which was responsible for India's dismal performance. By the sixties, it became obvious that limits to import substitution had been reached and a change in policy framework was required. Countries such as Korea, Taiwan and Singapore also followed import substitution in the initial period, but switched over to export promotion once import substitution slowed down. India, on the other hand, persisted with deeper and deeper import substitution even when world trade was booming in the sixties and the seventies. So import substitution per se was not wrong, but where India erred was to carry the process too far, with disastrous consequences in terms of growth and resource allocation.

The fact that there was widespread government failure, does it mean that state intervention in India was unjustified? Again, it may be argued that it is not state intervention per se, but the forms that state intervention takes which may explain the differences in economic performance. To be effective, state intervention has to be selective; otherwise there is a danger of 'spreading yourself too thinly' with ineffective outcome. In India the state became a monolith and its intervention was 'all pervasive'. It did not select its areas of static as well as dynamic comparative advantages carefully; overtime the state came to occupy low priority areas such as hotels, cars, and scooters to name a few. In Korea, on the other hand, the intervention was

selective; areas of dynamic comparative advantage were chosen very carefully; and the state went all out to 'promote' those chosen industries (such as steel, shipbuilding, and petrochemicals).

Finally, in India state intervention was, by and large, 'regulatory' (or rather debilitating) and not 'promotional' in character. For example, India's licensing policies decided the plant size, its location, the choice of technology as well as import content; in Korea the intervention took the form of 'promotion'. While the Indian firms were prevented from reaping the economies of scale, Korean success was based on global levels of plant size and production. In fact, Indian firms were penalised for producing more than licensed capacity! So it is clear that it is not intervention per se, but the form intervention takes, which may determine economic performance.

To conclude, while it would be rash to dismiss Indian planning as a dismal failure, it cannot be denied that Indian growth record was considerably below potential. The solution to 'market failure' is not to replace the markets with a set of bureaucratic and administrative controls, but to strengthen them and to smoothen their functioning. In India, governmental intervention succeeded in distorting and replacing the markets; an intervention designed to strengthen the markets, to provide information and institutions for their smooth functioning might have paid better dividend. The planning process in India may have yielded better outcome if, as a device, markets had been given a better chance, at least in those areas where they are known to function better.

CHAPTER 4

TRADE POLICY AND GROWTH: METHODOLOGY

Much of the empirical work on the subject of trade policy and growth adopts cross-sectional framework and neglects time-series analysis. One reason for this state of affairs is that it is very difficult to measure or quantify trade policy. Although very elegant definitions of trade orientation have been put forward in the literature such as the concept of Bias (Bhagwati, 1978; Krueger, 1978) or Effective Rate of Protection (Corden, 1966; Balassa, 1965), yet these concepts are difficult to operationalise in a time-series framework because of enormous data requirements.

The most important contribution of Little et al (1970) and Balassa (1971) studies was the computation of effective rates of protection (ERPs) for each country studied. Effective rate of protection for an industry can be defined as the difference in value added at domestic prices and that at international prices taken as a proportion of international value added. This concept has been designed to show that real protection often differs considerably from the nominal protection provided to an industry depending upon the extent of protection provided to the intermediate inputs. If one wants to study the structure of protection at a given point in time then ERP for each industry has to be calculated. The data requirements for doing this at a given point of time are so great that no time series of ERPs was constructed. The authors were satisfied with one or two snapshots of protection in their specific countries. No attempt was, therefore, made to study the evolution of ERPs in any country.

In the Krueger-Bhagwati study bias was defined as the ratio of the effective exchange rate for imports to that of exports. While effective exchange rate for imports depended on such factors as tariff, surcharge and premium on import licenses; effective exchange rate for exports was a function of export subsidy and other incentives to promote exports. It is clear that to construct this index not only information on each tariff rate is required but also a way has to be found to aggregate

tariffs to get a consolidated figure for the economy. Similarly, to gather data on premium is very difficult as it involves comparison of domestic and international prices of a large number of goods. Also, the issue of consolidating these premia into a single figure for the economy has to be faced. The result of all these difficulties was that construction of the time series of bias in the countries studied ran into serious problems.

Most cross-country econometric work on the relationship between trade orientation and growth assumes that more outward-orientated economies experience faster growth of exports and then it is tested whether countries experiencing faster growth of exports also experience rapid growth of GDP. A positive answer to the second proposition is then interpreted to mean that outward orientation leads to faster growth. The fundamental reason why this inelegant two-stage approach has become so popular, as pointed out by Edwards (1993), is the difficulty in directly measuring trade policy and trade orientation.

However, the popularity of the cross-section approach does not imply that it has been very influential in shaping policy views. It is doubtful whether the recent popularity of trade liberalisation has much to do with the evidence cited by cross-section studies. The country specific analysis, which has provided detailed discussions on the way in which different policies have affected economic performance in a number of countries, has contributed much to influence policy making. Successful experiences of countries such as Korea and Chile have greatly influenced the way in which politicians and policy advisors think about the contribution of trade orientation. Similarly, UN Commission for Latin America has also been influenced by the successful example of those countries which followed liberal trade policies. The commission, which earlier championed the cause of inward orientation, has recently switched to supporting outward orientation.

Many authors have noted that superiority of outward orientation must rely on evidence other than cross-section results. For example Sheehey (1990), notes that "an export promotion strategy, if it does provide the benefits widely attributed to it, must

rely on evidence other than these cross-country tests" (p. 115). Similarly, Pritchett (1996) found the conclusions of these cross-country studies doubtful as various indicators of trade policy were uncorrelated across countries and produced different country rankings of outward orientation.

Some authors have studied the relative contribution of export expansion, import substitution and domestic demand expansion to the growth of output in the framework provided by Chenery (1960). Main examples of studies which make use of this framework are Lewis and Soligo (1965) for Pakistan; Westphal (1979) for South Korea, and Nyaw (1979) and Lloyd and Sandilands (1986) for Singapore. These studies basically use a growth accounting framework seen from demand perspective as contrasted with the supply side neo-classical approach which attributes the growth of output to the growth of factor inputs and total factor productivity growth. However, for our purpose the growth accounting framework suggested by Chenery is unsuitable for two reasons. First, it does not analyse the impact of trade policy on the various components of growth. Measures of import substitution or export expansion are the end results; they do not measure the extent to which they are policy induced. Lloyd and Sandilands (1986), in their study on Singapore, are aware of this shortcoming and note that "the decomposition is derived from national accounting identities. It cannot, therefore, be construed as cause and effect" (p. 198). Secondly, in decomposition techniques residuals play an important part in defining variables and any error in the measurement of other variables gets reflected in the variable defined by the residual. Therefore, Love (1984) notes that time-series analysis has generally been more persuasive than decomposition techniques.

It is obvious that time-series analysis of different countries is of utmost importance and is often influential in shaping policy views. In the present study we shall analyse the relationship between trade and growth in a time-series framework for India. In the process, we hope to make some contribution to the debate on trade policy and growth. Particularly, it would be interesting to see whether liberal trade regime has a beneficial impact on growth in the context of a 'large' country such as India. If it does, then country size may not be crucial. Liberal trade orientation may be equally

successful in large as well as small countries. Therefore, this proposition needs investigation whether it is actually so particularly in the Indian context.

The relationship between trade policy and growth in India will be studied in several steps. In the first step an index of outward orientation will be constructed and its relationship with growth will be examined. This will be done on the basis of Dollar (1992) whose index is based on exchange rate distortion and its variability. In the second step we shall take up the relationship between trade policy and exports. In the next step the issue of causality between export growth and GDP growth is explored. In other words, we are interested in testing export-led-growth thesis for India. Finally, to put the whole thing in perspective, an effort will be made to examine whether government also acts as an engine of growth. These four steps will constitute the four empirical chapters of this research.

In carrying out the above steps, we shall make use of cointegration and error-correction modelling. More specifically, the Engle-Granger (1987) two-step approach, Johansen's (1988, 1990) Maximum Likelihood method, the ARDL approach and Granger's (1969) causality technique will be employed. Empirical research shows that most economic time series are non stationary and, therefore, traditional econometric techniques such as Ordinary Least Squares become inapplicable. In any time-series analysis it is essential to test whether the series under investigation is stationary or not. This can be done by a number of methods but we shall use Augmented Dickey-Fuller method.

The objective of this chapter is to develop a methodology or framework to test the various steps involved in the relationship between trade policy and growth in India in a time-series context. The scheme of this chapter is as follows: First, we shall discuss the various trade policy variables used in the literature and whether some of them could be used for a time-series study on India. Second, we shall develop a framework for testing whether a time series is stationary or not. Third, we shall take up the Engle-Granger two-step approach to cointegration. Next, Johansen's maximum likelihood procedure will be discussed. Finally, we shall take up a brief review of

Granger-causality technique. The ARDL approach will not be discussed in this chapter. We shall briefly take it up in Chapter 5 where this approach is used to check the robustness of our findings.

4.1 Measuring Trade Policy

We saw in the last section that concepts such as bias or effective rate of protection would be ideal for measuring trade policy or trade orientation. But these concepts, although elegant on paper, are difficult to operationalise in a time-series context because of insurmountable data requirements. Our task in this section is to identify the trade policy variables actually used in the literature and to isolate the ones appropriate for a time-series analysis for India. At the outset it is important to note that many of the trade-orientation indices have been developed using cross-country data and may not, therefore, be suitable for a time-series study.

The chapter on literature survey noted a number of trade-orientation indices used in cross-section analysis. These were actual trade flows, adjusted trade flows after taking into account structural characteristics of an economy, Balassa's index based on a structural model of trade, Leamer's indices based on Hechscher-Ohlin model of trade and Dollar's outward orientation index based on exchange rate distortion and its variability.

The simplest measure of trade orientation is to use actual trade flows such as their growth or share in GDP. The problem with this approach is that that they are an imperfect proxy for trade policy. By themselves they do not constitute trade policy variables. Regarding Balassa's or Leamer's indices, which are based on some model of trade, they are arrived at by using cross-section data and, therefore, represent a snapshot on a time scale. As such they cannot be used for time-series analysis unless one obtains sufficient number of snapshot observations for a particular country. This would be a monumental task and is, therefore, outside the scope of the present study.

The other indices which could be used for time-series analysis are average black-market premium, coefficient of variation in the black-market premium, average import tariffs, average import tariffs for the manufacturing sector, average non-tariff barriers coverage (percentage of tariff lines covered by non-tariff barriers), collected tariff ratios (defined as tariff revenues as a proportion of imports), and collected trade taxes ratio (total taxes on imports and exports as proportion of total trade).

It is obvious that a single summary measure of trade orientation is difficult to define. All these measures capture different aspects of trade policy and, therefore, none of them may be a satisfactory measure of trade orientation. Pritchett (1996) found that some of these indicators were uncorrelated or weakly correlated, so the conclusions of the cross-country studies based on them could not be relied upon.

Most studies on the relationship between trade and growth have relied on one or two of these indexes and therefore left themselves open for criticism by sceptics. Edwards (1998) opines that the difficulties in defining satisfactory summary indexes suggest that researchers should concentrate on determining whether econometric results are robust to alternative indexes. As mentioned in the survey chapter, Edwards (1992) using Leamer's indicators finds a strong and robust relationship between trade orientation and economic performance. The robustness of the results is checked by using a number of trade policy indicators. Similarly, Edwards (1998) finds a robust relationship between openness and total factor productivity growth by using nine indexes of trade policy. Edwards' (1992, 1998) results are obtained by using cross-section data.

It is obvious that there are difficulties in measuring and using a single summary measure of trade policy. These have to be kept in mind while undertaking a study on the subject. What we are interested in, in this research, is an outward-orientation index for India which is suitable for a time-series study. This task will be taken up in the next chapter. For this purpose we shall use the methodology developed by Dollar (1992). It is important to point out that Dollar uses his index in a cross-country framework whereas we shall seek to modify his methodology for developing a time-

series index for India. Dollar's cross-country index of real exchange rate distortion is based on the international comparison of prices prepared by Summers and Heston (1988). Dollar then uses this index to investigate the empirical relationship between outward orientation and growth.

4.2 Testing a Time Series for Stationarity

We start by defining stationarity. A time series is stationary (i.e., in the sense of weak stationarity) if its mean, variance and covariances remain constant over time. The classical regression analysis is applicable to time series which are stationary in this sense. If it is applied to non-stationary time series, spurious regression or spurious correlation problem is encountered. The estimated parameters then have non-standard distributions and the tests of significance based on t or F distributions have little or no meaning. Even if one obtains a high R^2 in such regressions, the significance of regression coefficients is artificially increased by common trends and much of the apparent correlation discovered will be spurious.

The problem of spurious regression is caused by the presence of trends in an economic time series. The underlying trends may be deterministic or stochastic in nature. If a time series is subject to deterministic trends, there are two ways to deal with this situation. First, the deterministic linear trend can be removed by prior regression on time and working with the residuals. Alternatively, a time trend can be incorporated into the regression model. Dealing with the underlying trends in this manner is possible if the series is a trend stationary process.

If, on the other hand, spurious regression results from the presence of stochastic trends in a time series the above procedure would be inappropriate. The appropriate procedure in that case would be to take the first (or higher) difference of the time series to make it stationary. If the underlying trend in a series can be removed in this manner then it is subject to difference stationary process. Nelson and Plosser (1982)

point out that most economic time series are subject to stochastic rather than deterministic trends.

Differencing a time series to remove the underlying trends may make a series stationary and the classical regression tools may become applicable, but this is achieved at a cost. Differencing a time series leads to loss of long-run information which is present in the levels of variables. A way out is to combine the short term with the long term by employing cointegration and error-correction modelling. Before we come to that it is essential to test an economic time series for stationarity.

There are various ways of testing a time series for stationarity. At an informal level, stationarity can be tested by plotting the correlogram of a time series. Correlogram is a graph of autocorrelation of a series at various lag levels. For a stationary time series, the correlogram tapers off quickly; for a non-stationary time series it dies off gradually.

At a formal level, stationarity can be checked by finding out if the time series contains a unit root. This can be done by the Dickey-Fuller (1979), augmented Dickey-Fuller and Phillips-Perron (1988) tests. In our empirical work we shall use the augmented Dickey-Fuller (ADF) test for testing whether a given time series is stationary or not. We, therefore, describe this test in the following paragraphs.

The easiest way to introduce the unit root test is to consider a first order autoregressive model:

$$Y_t = \rho Y_{t-1} + u_t \qquad (1)$$

where u_t is a stochastic error term that follows the classical assumptions of zero mean, constant variance and is nonautocorrelated. Such an error term is also known as white noise error term. Now if $\rho = 1$ the time series suffers from a unit root problem, i.e., it is random walk. In general the series Y_t is stationary if $\rho < 1$; if not it is nonstationary.

Equation (1) is often expressed in the following alternative form:

$$\Delta Y_t = \delta Y_{t-1} + u_t \qquad (2)$$

where $\delta = \rho - 1$. To test for stationarity we have to find out whether $\rho = 1$ or alternatively whether $\delta = 0$. Unfortunately, the t or F values do not follow their normal distributions even in large samples. Under the null of $\rho = 1$ Dickey and Fuller have computed critical values of t statistic on the basis of Monte Carlo simulations. Note that if $\rho = 1$ is rejected, we can use the usual Student's t test.

Equation (2) does not include an intercept or a time trend. Moreover, many terms in the lagged dependent variable may have to be included to achieve white noise residuals. Therefore, for theoretical and practical considerations the following equation, which is also known as augmented Dickey-Fuller regression, is estimated:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta Y_{t-1} + \varepsilon_t \qquad (3)$$

Again the null is $\delta = 0$ or $\rho = 1$. If by this procedure it is found that a series has a unit root but its first difference is stationary then it is integrated to the order one, i.e., $Y \sim I(1)$. If the original series has to be differenced twice before it becomes stationary then it is I(2). In general, if a time series has to be differenced d times before it becomes stationary it is integrated to the order d or I(d).

Phillips and Perron (1988) have suggested unit root tests involving non-parametric adjustments to the statistics described earlier. Perman (1991) points out that where uncertainty exists regarding the dynamic structure of the time series in question, and where random component may be non-white noise in quite general ways, the Phillips and Perron tests can be superior. In particular, the power of DF/ADF tests is likely to be low for series where moving-average terms are present or where the disturbances are heterogeneously distributed; the non-parametric adjustments are likely to raise the power of these tests in these circumstances.

An indication of whether the researcher should supplement ADF tests with the adjustments proposed by Phillips and Perron can be gained by inspection of the diagnostic statistics from the ADF regression. If the normality, autocorrelation or heterogeneity statistics are not in order, a prima-facie case exists for adopting Phillips-Perron approach. However, despite these considerations, ADF tests remain popular and widely used for testing stationarity.

4.3 The Engle-Granger Two-step Approach to Cointegration

In the earlier section we noted that problem of spurious regression (or spurious correlation) could be overcome by differencing the time series involved and then running regression involving stationary variables. This procedure is, however, unsatisfactory from an economic point of view as it involves loss of long-run information contained in the levels of the variables used. Cointegration and error-correction modelling offers a way out of this dilemma, where long-term information is contained in the error-correction term.

Let us now define cointegration. Two time series X and Y are cointegrated if both are integrated to the same order d (X,Y ~ (d)) and there exists a linear combination $Z = X - \delta Y$ which yields an outcome $Z \sim I(d-b)$ with $b > 0$, then X and Y are said to be cointegrated. For example, if X and Y are both I(1) and there is a linear combination of X and Y which is stationary or I(0), then X and Y are cointegrated.

Engle-Granger two-step approach involves first estimating a cointegrating or static regression by OLS. Before doing that it is important to make sure that the variables of this equation are I(1). The residuals of the static equation are then saved and tested for stationarity. If the residuals are found to be stationary, then in the second step, they are fitted into an error-correction model. The error-correction model can easily be estimated by OLS as it involves I(0) variables only. Error-correction model combines the short term with the long term; short-term information is contained in the differenced terms while the long-run information is given by the error-correction term.

Consider the regression model: $Y_t = a + b X_t + u_t$. In the first step of Engle-Granger two-step procedure equation such as this is estimated by OLS. This equation is known as cointegrating or static regression. The estimated residuals are: $\hat{u}_t = Y_t - \hat{a} - \hat{b} X_t$. These estimated residuals are then tested for stationarity. This can be done by estimating an ADF equation of the following form:

$$\Delta \hat{u}_t = \phi \hat{u}_{t-1} + \phi_1 \Delta \hat{u}_{t-1} + \phi_2 \Delta \hat{u}_{t-2} + \ldots + e_t . \qquad (4)$$

The null hypothesis is $\phi = 0$ as usual. As many lagged differenced terms are included on the right hand side as are necessary to produce non-autocorrelated residuals. Rejection of the null implies stationarity of residuals, which, in turn, implies cointegration between X_t and Y_t. In this case the critical values are not the same as used for the usual ADF tests. The critical values appropriate in this case are from MacKinnon (1991).

A second test to test for cointegration is the Cointegrating Regression Durbin-Watson test (CRDW). This test is easy to derive and can be used for quick approximate result. CRDW is computed from the DW statistic from the cointegrating regression. However, the null in this case is DW = 0 rather than the usual DW = 2. Simulation experiments (for a two variable case) suggest that 95% critical values of this statistic is 0.78 in the vicinity of 50 observations and 0.39 in the vicinity of 100 observations. However, this statistic can only be relied upon if the disequilibrium errors are generated by a first order auto-regressive process.

Once it is confirmed that the residuals of the cointegrating equation are stationary, we can now proceed to the second step of the Engle-Granger procedure. Engle and Granger (1987) show that if two time series X_t and Y_t are cointegrated, the short-term disequilibrium relationship between them can always be expressed in the error-correction form:

$$\Delta Y_t = \text{lagged } (\Delta Y, \Delta X) - \lambda \Delta \hat{u}_{t-1} + e_t \qquad (5)$$

where $\hat{u}_t$ is the disequilibrium error or the extent of departure from the long-run relationship given by the cointegrating equation and λ is short-run adjustment parameter. This is the Granger-representation theorem. Note that this is a sensible equation to estimate by OLS since all its variables are I(0). The precise number of lags on the differenced terms are not specified by the theorem. One should include as many lags as are necessary to whiten the residuals.

Stock (1987) has demonstrated that provided X_t and Y_t are cointegrated, OLS estimators $\hat{a}$ and $\hat{b}$ will not only be consistent but asymptotically efficient as well. This suggests that static regressions of the type discussed above will not necessarily give spurious results and dynamic mis-specifications will not necessarily have serious consequences. This is, however, a large sample result. In small samples, OLS estimates $\hat{a}$ and $\hat{b}$ are biased because of the omission of lagged values of X_t and Y_t. Banerjee et al. (1986) show that this bias is related to 1- R^2, i.e., higher the R^2 the lower would be the bias. Note that OLS estimators may themselves be consistent, estimated standard errors, t and F values cannot be used for significance testing. This is due to the fact that cointegrating equation contains I(1) variables, so distributions of the OLS estimators are non-standard.

The two-variable case discussed above can be extended to a multivariate case. There is, however, a complicating factor. In the two-variable model, the cointegrating vector is unique. In the multivariate case there may be more than one cointegrating vector. In such a situation it is not clear which one would be more appropriate to use. It has been suggested that OLS would only detect the minimum variance vector (see Hall and Henry, 1988). The application of Engle-Granger two-step estimator to multivariate case is thus not very satisfactory.

4.4 Johansen's Maximum Likelihood Estimator

Johansen (1988) and Johansen and Juselius (1990) Maximum Likelihood approach to cointegration has several advantages over the Engle-Granger two-step method. These are well summarised in Perman (1991).

The maximum likelihood (ML) approach gives consistent estimates of the whole cointegrating matrix, and produces likelihood ratio statistic for the maximum number of distinct equilibrium vectors in the matrix. Thus it is possible to identify the whole set of cointegrating relationships using this method. In other words, it is not only possible to identify the number of cointegrating vectors by this approach, but also the estimates of these vectors.

A second advantage of this approach is that likelihood ratio (LR) test statistic has an exact known distribution which is a function of just one parameter. Test statistics in the Engle-Granger approach cannot be compared with the critical values from known distributions. Because of the presence of I(1) variables in the cointegrating regression in step one of the EG procedure, the distributions of the OLS estimators are non-standard. The estimated standard errors or t values cannot be used for significance testing. This means that if EG approach is used in a multivariate case one is not sure whether all the variables enter into a long-run relationship. Furthermore, given the distributional properties of the ML estimator, specification tests can be carried out on the cointegrating vectors.

Details of the ML estimation procedure are found in the original references by Johansen (1988) and Johansen and Juselius (1990) and good summaries are available in Muscatelli (1990, 1992), and Dhawan and Biswal (1999). In the following paragraphs we shall attempt to outline the broad contours of this approach.

Consider an unrestricted VAR model with upto k lags in which the process X_t, for given values of $X_{-k+1}, \ldots, X_0$, is defined by

$$X_t = \mu + \Pi_1 X_{t-1} + \ldots + \Pi_k X_{t-k} + \varepsilon_t, \qquad t = 1,2\ldots T \qquad (6)$$

where ε_t is i.i.d (independently and identically distributed) p-dimensional Gaussian error term with mean zero and variance matrix Λ, X_t is a vector of I(1) variables and μ is a vector of constants. Since X_t is nonstationary, the above equation can be expressed in first-differenced error-correction form

$$\Delta X_t = \mu + \Gamma_1 \Delta X_{t-1} + \ldots + \Gamma_{k-1} \Delta X_{t-k+1} + \Pi X_{t-k} + \varepsilon_t, \qquad (7)$$

where $\Gamma_i = -(I - \Pi_1 - \ldots - \Pi_i)$, $\quad i = 1, \ldots, k-1$ and $\Pi = -(I - \Pi_1 - \ldots - \Pi_k)$.

Note that equation 7 is expressed as a traditional first difference VAR model except the term ΠX_{t-k}. The coefficient matrix Π contains information about long-run relationships between the variables in the data vector. There are three possible cases. If the rank of Π equals p, i.e. the matrix Π has a full rank, the vector process X_t is stationary. If rank of Π equals 0, the matrix Π is a null matrix and the above equation corresponds to a traditional differenced vector time-series model. Finally, if $0 < r < p$ there exist r cointegrating vectors; in that case $\Pi = \alpha\beta'$, where α and β are $p \times r$ matrices. The cointegrating vectors β have the property that $\beta' X_t$ is stationary even though X_t itself is nonstationary. In this case equation 7 can be interpreted as an error-correction model.

Johansen (1988) and Johansen and Juselius (1990) derived the likelihood ratio test for the hypothesis of r cointegrating vectors or $\Pi = \alpha\beta'$. The cointegrating rank, r, can be tested with two statistics, namely trace and maximal eigenvalue.

The likelihood ratio test statistic for the null hypothesis that there are at most r cointegrating vectors is the trace test and is computed as

$$\text{Trace} = -T \sum_{i=r+1}^{p} \ln(1 - \hat{\lambda}_i) \qquad (8)$$

where $\hat{\lambda}_{r+1}, \ldots, \hat{\lambda}_p$ are the p - r smallest estimated eigenvalues. The likelihood ratio test statistic for the null hypothesis of r cointegrating vectors against the alternative of r + 1 cointegrating vectors is the maximal eigenvalue test and is given by

$$\lambda_{max} = - T \ln (1 - \hat{\lambda}_{r+1}). \qquad (9)$$

It has been suggested that the above tests of cointegration rank are contingent upon the presence or the absence of deterministic components in the dynamic model. A priori, the decision regarding the right model may not be easy, so Johansen (1992, 1995) suggests the need to test the joint hypothesis of both the rank order and the deterministic components based on the basis of the so called Pantula principle. That is, all the models (that can be realistically considered) are estimated and the results are presented from the most restrictive to the least restrictive alternative. The test procedure then is to move through from the most restrictive model to less and at each stage compare the trace (or maximal eigenvalue) test statistic to its critical value and only stop the first time the null hypothesis is not rejected.

The next question is to investigate whether all the variables in the model should enter into the long-run equilibrium relationship. This can be done by testing linear restrictions on the long-run coefficients after they have been normalised. The hypothesis of long-run exclusion of each variable is tested using a likelihood ratio test which is asymptotically distributed as χ^2 with degrees of freedom equal to the number of restrictions tested. If the test statistic exceeds the 95% critical value then those coefficients are significant implying that the concerned variables should be present in the long-run equilibrium relationship.

4.5 Granger-Causality Technique

In this section Granger (1969) causality is briefly discussed. The nitty-gritty issues of implementing this procedure are taken up in Chapter 7, where the technique is used to find the direction of causality between export growth and income growth.

The Granger-causality test involves expressing a vector stationary time series dependent variable as a function of its own lagged values and of lagged values of the variable thought to affect the dependent variable. In order to test that growth in X causes growth in Y, the following equation with distributed lags must be estimated:

$$y_t = a + \sum_{i=1}^{M} a_1 y_{t-i} + \sum_{i=1}^{N} a_2 x_{t-i} + u_t \qquad (10)$$

where lower case letters denote growth rates and i denotes the order of lags.

To accommodate the possibility that causation may run in the opposite direction from y to x the following equation is also estimated:

$$x_t = b + \sum_{i=1}^{J} b_1 x_{t-i} + \sum_{i=1}^{K} b_2 y_{t-i} + w_t \qquad (11)$$

An F test for the joint significance of the coefficients may then be constructed on the basis of the sums of squared residuals in the first-stage constrained equation and in the second stage unconstrained equation. The direction of causation is determined by the sign of the sum of coefficients $\sum_i a_2$ for causation from x to y (equation 10) and $\sum_i b_2$ for causation from y to x (equation 11).

The above procedure would need modification if the level variables X and Y are cointegrated as another channel of causality opens up. In that case the above equations have to be expressed in the error-correction form; and the error-correction term then gives the long-term impact.

CHAPTER 5

AN INDEX OF OUTWARD ORIENTATION AND ITS RELATIONSHIP WITH GROWTH IN INDIA

The objective of this chapter is to develop an index of outward orientation and then empirically examine its relationship with growth in India in a time-series framework. The empirical investigation will be done making use of cointegration and error-correction modelling. In particular, we shall make use of Engle-Granger two-step approach, Johansen's ML approach and ARDL approach to cointegration. These different approaches to cointegration are employed in order to see whether our results are robust to the methodology being used. In developing the index of outward orientation we shall be guided by the work of Dollar (1992).

At the outset it is important to note that Dollar develops a cross-country index, whereas our objective is to use his methodology to develop a time-series index for India. Dollar's index measures the extent to which each country's real exchange rate is distorted from its free trade level by the trade regime. His cross-country index of real exchange rate distortion is based on the international comparison of prices prepared by Summers and Heston (1988). This index is then used to investigate whether there is any empirical relationship between outward orientation and economic growth.

Several studies investigating outward orientation and growth use export growth as a proxy for outward orientation. The main examples of this approach are Michaely (1977), Heller and Porter (1978), Feder (1983), Ram (1985,1987) and more recently Levin and Raut (1997). However, there are exceptions like Edwards (1992), Dollar (1992) and Harrison (1996) which make use of alternative trade policy variables or indices. In our empirical investigation, instead of using export growth to measure outward orientation, we shall develop an index based on Dollar (1992) as mentioned above. It may be noted that this study is perhaps the first attempt to adapt Dollar's

procedure in a time-series context. This modified procedure can be used for a time-series study of any country for which Summers and Heston price data are available.

The scheme of this chapter is as follows. First we shall discuss the methodology used by Dollar. Next, we shall make use of his technique to develop the index for India. Finally, we shall use this index to test its relationship with growth in India by using data obtained from National Accounts Statistics, Government of India. The period of our study is 1950-1992 as the index of outward orientation could be developed for this period only. This is because the latest version of the Summers and Heston data (downloaded from NBER website: http//:www.nber.org) is available till 1992.

5.1 Dollar's Index of Outward Orientation

As mentioned earlier, Dollar's cross-country measure of outward orientation of an economy is based on international comparisons of price levels compiled for 121 countries by Summers and Heston (1998). They price the same basket of consumption goods in domestic currency in different countries and then convert the measure into US dollars by using the official exchange rate. Using the US as the benchmark country, the index of country i's relative price level (RPL) is

$$RPL_i = 100 \times P_i/P_{us} \times 1/e$$

where e is the exchange rate (no. of units of domestic currency per unit dollar) and P_i is the consumption price index for country i. This formulation is quite similar to the usual measure of the real exchange rate except for the fact that here price indices for each country have the same weights whereas in the real exchange rate index trade or export weights with major trading partners are used.

If all goods are tradable and there are no trade barriers, the above measures would all tend towards 100 in the long run. Short-run fluctuations may arise, but over time the average value would tend to be 100. Hence, one could use cross-country variations in these price levels to measure inward- or outward-orientation caused by trade policy.

The existence of non tradables, however, complicates the picture. Non tradable prices will differ across countries reflecting relative factor endowments. For example, haircuts would be cheaper in a country with relatively abundant labour. The Summer-Heston price levels need to be corrected, therefore, for the variation in relative factor endowments. This can be done by regressing RPL on endowments, as explained below.

Ideally, one can employ a large range of endowments: capital stock, different types of land, natural resources, labour skills, and so on. In practice, it is almost impossible to compile such data for 117 countries. Hence, Dollar uses real per capita income as a proxy for factor availability and population density as an indicator of land availability relative to labour force.

To estimate the relationship between price level and endowments, Dollar uses different specifications of the following basic equation:

$$RPL_i = f(GDP_i, DENS_i)$$

Where GDP_i is i's per capita income and $DENS_i$ is the density of population. From this Dollar estimates eight different specifications and his results are robust to the specification used. While there is no clear relationship between the price level and the population density, the relationship between the price level and per capita GDP is strong and consistent in all the eight specifications. The estimated relationship then gives the international 'norm' and a country's orientation is measured as a deviation from this 'norm'.

Each country's predicted price level can be calculated from this estimated relationship given its endowment. Since the density of population is not a significant factor, each country's price level for each year can be calculated given its per capita income. The actual price level divided by the predicted price level is the index of distortion. Dollar calculates this index for ten years (1976-85) for each country and then averages it to eliminate short-term fluctuations. Dollar then combines this real exchange rate

distortion index with its variability to produce a complete outward-orientation index. This is done by taking a weighted average of the two measures. This helps him in sorting countries in terms of orientation and in significantly reducing the number of anomalies as compared to a situation where exchange rate distortion alone is used.

Dollar notes that even after the above adjustment is made one main anomaly still remains. That is, low-income Asian economies such as Bangladesh, Nepal, Burma and India, which are thought to be inward oriented, are found to be surprisingly open. For all of them the distortion index lies below 100 and the exchange rate variability is quite low ranging from 0.11 for Bangladesh to 0.15 for Burma. The explanation given by Dollar is that the data may be picking up the fact that these economies may be quite open as compared to other very low-income countries such as Ghana and Sierra Leone. For these countries, the distortion index is above 200 and real exchange rate variability is above 0.25. In the words of Dollar: "No doubt some will be surprised to see Bangladesh and India cited as examples of outward oriented economies. But the price level data indicate that they are more outward oriented than other very low income countries" (p. 538).

Dollar then regresses per capita GDP growth over the period 1976-85 on investment ratio, real exchange rate variability and the index of real exchange rate distortion. He finds that growth is positively related with investment ratio and negatively with distortion and variability of the real exchange rate. The regression analysis is repeated for poorest 24 countries and it is found that the real exchange rate distortion is the only significant variable; the other two explanatory variables namely investment rate and the real exchange rate variability are insignificant. Thus, for the poorest countries the only thing that explains growth is the real exchange rate distortion. The main result emerging from this analysis is that there is a negative relationship between distortion in the real exchange rate and growth in per capita GDP, after controlling for the effects of real exchange rate variability and investment ratio.

5.2 Outward-Orientation Index for India

Ultimately, Dollar used one estimated equation (i.e., his specification no. 4) to derive his cross-country index. We shall derive our index for 43 years (1950-92) for India using three different specifications. But in our empirical work, we shall use the equation corresponding to Dollar's specification 4, so that our results become directly comparable to those of Dollar. The three specifications are:

1. $RPL = 37 + 0.009y - .002y^2$ (corresponds to Dollar's specification 4)

2. $RPL = 40.7 + .007y$ (corresponds to his specification 5)

3. $RPL = 37.2 + .011y - .004y^2$ (corresponds to his specification 8)

where RPL is the relative price index and y is per capita GDP in thousands of dollars in terms of purchasing power parity. Note that density of population is not used since Dollar did not find a significant relationship when he used this variable. Equations 1 and 2 contain dummies for Latin America and Africa. Since India is neither in Africa nor in Latin America, the coefficients of these dummies have been omitted in the first two equations (as they take the value zero for India). Based on these three equations, we obtain three time series of values for the outward-orientation indices D1, D2 and D3 given in Table 5.1. It may be noted that irrespective of the index, the ordering for different years remains the same although the distance between two consecutive observations may be different in different series. This is exactly similar to the result obtained by Dollar in a cross-country context where ordering of different countries did not change when a different specification was used.

In practice, we shall use D1, corresponding to Dollar's specification 4, in our empirical work on the effect of outward orientation on growth. The main reason for this choice is to make our results comparable with those obtained by Dollar (as Dollar also uses this particular specification). It may be noted that it does not really matter which specification one uses as all of them produce the same ordering of years.

Table: 5.1
Index of Outward Orientation for India

Year	y	RPL	D1	D2	D3	CV1	CV2	CV3
1950	0.590	58.42	157.89	98.35	157.04			
1951	0.608	54.65	147.70	92.00	146.91			
1952	0.617	50.65	136.89	85.27	136.16	0.098	0.098	0.098
1953	0.641	50.57	136.68	85.13	135.94	0.082	0.082	0.082
1954	0.666	44.82	121.14	75.45	120.48	0.057	0.057	0.057
1955	0.672	45.59	123.22	76.75	122.55	0.048	0.048	0.048
1956	0.689	48.09	129.97	80.96	129.27	0.030	0.030	0.030
1957	0.689	47.88	129.41	80.61	128.71	0.025	0.025	0.025
1958	0.718	46.49	125.65	78.27	124.97	0.025	0.025	0.025
1959	0.717	45.85	123.92	77.19	123.25	0.033	0.033	0.033
1960	0.766	45.48	122.92	76.57	122.26	0.042	0.042	0.042
1961	0.751	49.19	132.95	82.81	132.23	0.064	0.064	0.064
1962	0.760	49.73	134.41	83.72	133.68	0.088	0.088	0.088
1963	0.815	53.11	143.54	89.41	142.77	0.096	0.096	0.096
1964	0.847	57.40	155.14	96.63	154.30	0.088	0.088	0.088
1965	0.751	61.33	165.76	103.25	164.87	0.102	0.102	0.102
1966	0.653	51.01	137.86	85.88	137.12	0.140	0.140	0.140
1967	0.698	47.27	127.76	79.58	127.07	0.148	0.148	0.148
1968	0.725	43.51	117.59	73.25	116.96	0.084	0.084	0.084
1969	0.759	43.86	118.54	73.84	117.90	0.055	0.055	0.055
1970	0.802	41.33	111.70	69.58	111.10	0.027	0.027	0.027
1971	0.808	41.58	112.38	70.00	111.77	0.065	0.065	0.065
1972	0.786	43.07	116.41	72.51	115.78	0.090	0.090	0.090
1973	0.786	48.36	130.70	81.41	130.00	0.100	0.100	0.100
1974	0.765	49.96	135.03	84.11	134.30	0.113	0.113	0.113
1975	0.815	39.66	107.19	66.77	106.61	0.125	0.125	0.125
1976	0.812	38.95	105.27	65.57	104.70	0.112	0.112	0.112
1977	0.857	39.46	106.65	66.43	106.08	0.049	0.049	0.049
1978	0.882	40.33	109.00	67.90	108.41	0.065	0.065	0.065
1979	0.837	53.94	118.76	73.97	118.12	0.061	0.061	0.061
1980	0.882	44.86	121.24	75.52	120.59	0.080	0.080	0.080
1981	0.908	39.67	107.22	66.78	106.64	0.107	0.107	0.107
1982	0.936	36.85	99.59	62.04	99.06	0.134	0.134	0.134
1983	0.986	35.09	94.84	59.07	94.33	0.100	0.100	0.100
1984	1.008	31.50	85.14	53.03	84.68	0.081	0.081	0.081
1985	1.050	31.66	85.57	53.30	85.11	0.053	0.053	0.053
1986	1.092	30.61	82.73	51.53	82.28	0.036	0.036	0.036
1987	1.123	32.49	87.81	54.70	87.34	0.070	0.070	0.070
1988	1.204	29.59	79.97	49.81	79.54	0.074	0.074	0.074
1989	1.235	27.06	73.14	45.56	72.74	0.148	0.148	0.148
1990	1.264	27.85	75.27	46.89	74.87	0.173	0.173	0.173
1991	1.251	21.39	57.81	36.01	57.50			
1992	1.282	19.6	52.97	32.99	52.69			

where y = real per capita income in thousands of US dollars in terms of purchasing power parity, RPL = relative consumption price level of India as compared to US.

Source: Summers and Heston, NBER Website, Penn World Tables Mark 5.6. This is an updated version of Summer and Heston (1991), "*The Penn World Table Mark 5: An Expanded Set of International Comparisons, 1950-1988*", Quarterly Journal of Economics, Vol. 106, No. 9 (May).

Dollar also calculates the coefficient of variation of the outward-orientation index on the basis of ten observations for each country. In a time-series context we calculated the coefficient of variation corresponding to the five year moving average for each year. This means that while we had 43 observations for D1, we only had 39 for the coefficient of variation of D1 (CV1) around its five yearly mean as the first and the last two observations are removed. Corresponding to D1, D2 and D3 we have CV1, CV2 and CV3.

A cursory look at D1 shows that it is sensitive to nominal exchange rate variations as well as bouts of inflation in India from 1950 to 1992. For example, there was a major devaluation of the Indian Rupee in 1966 and this is reflected in a steep fall in the distortion index from 1965 to 1966. Similarly, another major devaluation was undertaken in 1991 and this is reflected in a sharp fall in the index from 1990 to 1991. To take yet another example, there was a major bout of inflation during 1973 and this is reflected in a steep rise in the distortion index from 1972 to 1973. The distortion index for India seems to be capturing the ground realities quite well.

A closer look at D1 shows that the Indian economy was inward-orientated in comparison to the international norm up to 1981 (reflected in the fact that the distortion index was more than 100) after which it became outward-orientated as compared to the international norm (distortion index was less than 100). D3 is almost similar to D1. However, D2 differs markedly from D1. D2 shows that Indian economy was outward-orientated throughout the period 1950-92 except for 1964. How does one reconcile these two results?

Absolute numbers are not important in themselves; it is the ordering of countries which is important, as noted by Dollar. Dollar shows that using different specifications leads to different absolute values of the outward orientation index but the hierarchy among the regions (and countries) does not change. In the words of Dollar: "All of the specifications result in the conclusion that Africa is the most inward oriented and Asia most outward oriented" (p. 530). Moreover, "the absolute level of this index has

no meaning at all; what is important is the relationship among countries and regions" (p. 537). Further, using specification 6 instead of 4, for the purpose of sensitivity analysis, he finds that "the new specification compresses the distance between Asia and Africa but does not change the basic ordering" (p. 537).

In our time-series context all the indices above convey the same information with respect to the ordering of different years. The index for the year 1992 is about one third of the index for 1950, irrespective of the series taken. Therefore, our empirical results will not be affected by using different specifications.

5.3 Empirical Results

5.3(a) Growth Equation Using Engle-Granger Two-step Approach

Before attempting cointegration and error-correction modelling, all the variables need to be tested for stationarity by applying ADF tests. This is done in Table 5.2a. It can be seen that all level variables are nonstationary (i.e., the null of a unit root is accepted) as the ADF test statistic is more than the 95% critical value. For the first differences, however, the null of a unit root is rejected implying that the first differences are stationary or I(0). Since the first differences are stationary or I(0), all level variables are integrated of the order one or I(1). As all level variables are integrated to the same order, the following cointegrating equation can be estimated:

$$LY = f(LI, LD1, LCV1)$$

where LY is the log of real per capita GDP, LI is the log investment to GDP ratio, LD1 is the log of outward orientation index D1 developed by us earlier and LCV1 is the coefficient of variation of this index. There are two reasons why the variables are expressed in natural logs. Firstly, if the variables are in logs, the coefficients of the cointegrating equation can be interpreted as long-term elasticities. Secondly, if the level variables are in logs their first differences in the error-correction model can be

interpreted as growth rates. That is, ECM can be interpreted as a growth equation. Estimation of the above cointegrating relation by OLS gives the following result:

$$LY = 9.002 + 0.334LI - 0.502LD1 + 0.059LCV1$$

$$\overline{R}^2 = 0.930 \quad DW = 1.323$$

Engle-Granger Two-step Approach

Table: 5.2a
ADF Tests for Unit Roots

variables	test statistics		95% critical values	
	levels	first difference	levels	first difference
LY	-0.626(0)	-7.283(0)	-3.519	-2.932
LI	-2.125(4)	-5.949(3)	-2.932	-2.934
LD1	1.080(0)	-5.084(0)	-2.940	-2.942
LCV1	-2.949(1)	-5.183(0)	-2.950	-2.953

Table: 5.2b
Residual Based Tests for Cointegration

cointegraing regression	period	$\overline{R}^2$	CRDW	ADF statistics	95% critical value
LY=f(LI,LD1,LCV1)	1952-90	0.930	1.323	-4.873(1)	-4.435

where L before a variable stands for natural log
Y = real per capita income
I = investment to GDP ratio
D1 = Dollar's index of outward orientation
CV1 = Coefficient of variation of D

Notes:
1. Terms in the brackets are the no. of lags or augmentations, k, used in the ADF regressions.
2. k is chosen with the help of a model selection criteria such as AIC, SBC and HQC.
3. 95% and 90% critical values of the CRDW statistic in the vicinity of 50 observations are 0.78 and 0.69 respectively (Engle and Yoo, 1987).
4. ADF critical values in Table 5.2b are different from those in Table 5.2a, and have been taken from MacKinnon (1991). In Table 5.2a, they have been taken from Dickey and Fuller (1979).

The residual-based test (or the ADF test) for cointegration is given in Table 5.2b. It can be seen that the ADF statistic is more negative than its 95% critical value. Therefore, the null of no cointegration is rejected at 5% level of significance. This finding is further supported by the result of cointegrating Durbin-Watson statistic (CRDW). The CRDW is more than its 95% critical value of 0.78, implying that it is significantly different from zero. The variables in the above cointegrating equation are thus cointegrated.

Note that all variables have the expected signs except the coefficient of variation of the outward orientation index. The coefficient of LI is positive showing that higher the investment ratio, higher is the real per capita income. The sign of LD1 coefficient is negative signifying that the greater the distortion in real exchange rate (or the lower the outward orientation), the lower would be the real per capita income. All these findings are similar to Dollar (1992) who finds that investment ratio has a positive and distortion index has a negative influence over per capita income growth.

The sign of CV1 is different from that obtained by Dollar. It appears that in the Indian case higher variability of the real exchange rate leads to higher real per capita GDP. A close look at Table 5.1 shows that average CV1 is higher during 1980-92, the period which saw an acceleration in real per capita income. This can be seen from the fact that during the first 30 years (1950-79) real per capita income grew at an annual average rate of 1.4% while in the next 13 years it grew by an average rate of 3.4% per annum. The coefficient of variation increased from an average of 7.5% in the first 30 years to 9.6% in the next 13 years. These findings are consistent with the fact that reforms during the 1980s and 90s involved frequent exchange rate adjustment to bring it in line with more realistic levels. The real exchange rate variability went up during the last 13 years as a result of more flexible exchange rate policy. At the same time, per capita income growth during these years also accelerated because of more liberal policies of the government.

The error-correction representation of the above cointegrating relation is obtained as below by OLS:

$$\Delta LY = \underset{\text{p values}}{\underset{(.014)}{0.018} + \underset{(.227)}{0.072}\Delta LI - \underset{(.024)}{0.181}\Delta LD1 + \underset{(.497)}{0.011}\Delta LCV1 - \underset{(.600)}{0.104}\Delta LY(-1)}$$

$$- \underset{(.176)}{0.080}\Delta LI(-1) + \underset{(.798)}{0.023}\Delta LD1(-1) - \underset{(.703)}{0.006}\Delta LCV1(-1) - \underset{(.072)}{0.322}e(-1)$$

$\overline{R}^2 = .095$ DW = 2.044 LM ~ $\chi^2_{(1)} = .329(.566)$

Using the standard testing-down procedure, a more parsimonious model was obtained:

$$\Delta LY = \underset{\text{p values}}{\underset{(.010)}{0.150} - \underset{(.043)}{0.131}\Delta LD1 + \underset{(.101)}{0.858}\Delta LI - \underset{(.065)}{0.080}\Delta LI(-1) - \underset{(.020)}{0.288}e(-1)}$$

$\overline{R}^2 = 0.145$ DW = 2.282 LM ~ $\chi^2_{(1)} = 1.596(.206)$

The Lagrange Multiplier test showed the absence of residual serial correlation. Note that all variables have the correct signs. Growth of outward orientation variable has short-term as well as long-term impact on per capita income growth. While ΔLI has a positive sign ΔLI(-1) has a negative sign. Overall, the growth of investment ratio has a positive impact as positive coefficient more than outweighs the negative coefficient.

The above analysis based on Engle-Granger two-step approach suffers from a number of drawbacks. Firstly, in the above analysis we have assumed that there is a unique cointegrating vector. This need not be the case except in the simple bivariate model. In a multivariate case there could be more than one cointegrating vectors. The Engle-Granger procedure by itself cannot tell us the uniqueness of the cointegrating vector or the exact number of these vectors present in the system or their estimates. The OLS simply chooses the least variance vector if there is more than one present.

Secondly, tests of significance cannot be carried out on the estimated parameters as their distributions are non-standard because of the presence of I(1) variables in the static (or cointegrating) equation. So there is no way of knowing whether all the right

hand side variables enter into a long-term relationship with the real per capita income. Because of these drawbacks, we have to use other approaches such as Johansen's ML procedure.

5.3(b) Johansen's Maximum Likelihood Approach

Recall from our earlier discussion that the ML approach has a number of advantages over the two step Engle-Granger procedure. First, it is not only possible to identify the number of cointegrating vectors by the ML approach but also their estimates. Secondly, since LR test statistic has an exact known distribution, it can be used for significance testing. For example, by using this approach it is possible to find out which of the variables enter into a long-term relationship with the left hand side variable. Also recall from that discussion that Johansen (1988) and Johansen and Juselius (1990) derived the likelihood ratio test for the hypothesis that there are r cointegrating vectors. The cointegrating rank, r, can be tested with two statistics, trace and maximal eigenvalue. In case of trace statistic the null of at most r cointegrating vectors is tested; in maximal eigenvalue the null of r cointegrating vectors is tested against the alternative of r + 1 vectors. The Monte Carlo experiments reported in Cheung and Lai (1993) suggest that trace test shows more robustness to both skewness and excess kurtosis in the residuals than the maximal eigenvalue test.

While applying the Johansen's procedure there are two problems that need to be tackled. The first is the issue of setting the appropriate lag length, k, of the VAR model in order to ensure the error terms in the vector error-correction model (VECM) are Gaussian. That is, the lag length has to be set in such a manner so that the residuals in VECM do not suffer from autocorrelation, non-normality etc. In practice, this is done on the basis of an information criterion such as Akaike Information Criterion (AIC) and Schwarz Baysian Criterion (SBC). However, individual equations of the VAR need to be checked for the presence of autocorrelation and non-normality etc. So information criterion is combined with the residual analysis of unrestricted VAR model to arrive at the optimal lag length. If for example, the diagnostic statistics show the presence of autocorrelation in one of the

VAR equations, the problem can be overcome by increasing the lag length. In our case, we used AIC to choose 4 as the order of VAR; residuals of the individual VAR equations were then inspected for autocorrelation and non-normality etc. The diagnostics showed that the residuals were Gaussian.

Johansen's Maximum Likelihood Approach

Table 5.3a
Cointegration rank and model selection:
Trace statistic

r	model 2	model 3	model 4
0	88.73 (53.48)	79.76 (48.88)	91.89 (63.00)
1	40.40 (34.87)	**31.44** (31.54)	38.98 (42.34)
2	16.76 (20.18)	11.95 (17.86)	15.34 (25.77)
3	7.74 (9.16)	3.37 (8.07)	3.65 (12.39)

Table 5.3b
maximal eigenvalue statistic

r	model 2	model 3	model 4
0	48.32 (28.27)	48.32 (27.42)	52.91 (31.79)
1	23.64 (22.04)	**19.49** (21.12)	23.64 (25.42)
2	9.02 (15.87)	8.58 (14.88)	11.78 (19.22)
3	7.74 (9.16)	3.37 (8.07)	3.56 (12.39)

Table 5.3c
Long-run estimates

variable	estimated coefficient	standard error	LR statistic (prob.)
LI	0.057	0.059	0.736 (.391)
LD1	-0.722	0.062	39.13 (.000)
LCV1	0.214	0.024	28.30 (.000)

where r = cointegration rank or the no. of cointegrating vectors

Notes:
1. In Tables 5.3a and 5.3b figures in the brackets are the 95% critical values of the respective test statistic.
2. In Table 5.3c figures in the bracket are the probability values of LR statistic.

The second issue concerns the presence of deterministic components (a constant and a trend) in the cointegration space. An important feature of the VECM is that it includes both differences and levels in the same model. The asymptotic distribution of the test for cointegration depends on the assumption regarding the deterministic components in a model. The choice between the various models boils down to three realistic cases: model 2, which includes intercept in the cointegration relation, model 3 which allows deterministic trends in levels (but neither a trend nor an intercept is present in the cointegration relation), and model 4 which allows for trend in the cointegration space. The question that which of the three models should be used is not easily answered a priori. Thus, Johansen (1992) suggests the need to test the joint hypothesis of both the rank order and deterministic components based on the so-called Pantula principle.

The testing strategy begins with choosing the most restrictive model (rank 0, model 2) from Table 5.3a and comparing the test statistic with its 95% critical value given in the brackets. If the model is rejected as indeed is the case here, we continue to model 3 with the rank being kept fixed. This procedure is continued till the null is accepted for the first time. Following this procedure, we find that model 3 with rank equal to one is the most appropriate model. This can be seen from Table 5.3a as we first accept model 3 when $r = 1$ with trace test statistic equal to 31.44. Note that the cointegrating vector is unique (as $r = 1$). Also, the cointegrating relation does not include a constant.

The choice of model 3 and one cointegrating relation is further confirmed by maximal eigenvalue test statistic. This is shown in Table 5.3b. Following the above testing strategy of moving from the most restrictive model to less restrictive models, again model 3 is chosen as for $r = 1$ trace test statistic is 19.49 and is less than its 95% critical value of 21.12. So we conclude that there is one cointegrating vector; and model 3, which allows neither intercept nor trend in the cointegration space, is the most appropriate model.

After having established a unique cointegrating vector, the next step is to obtain point estimates. Based on model 3, $r = 1$, the results are shown in Table 5.3c. It can be seen

from the estimated coefficients that the log of investment ratio (LI) and the log of real exchange rate variability (LCV1) have a positive influence over the log of real per capita income (LY) while the log of Dollar's index (LD1) has a negative influence. The question whether all the three variables should enter into a long-run relationship with LY can be answered by looking at likelihood ratio statistic which is distributed χ^2 with r degrees of freedom. The test statistic for LD1 and LCV1 is 39.13 and 28.30 respectively and exceeds the 95% critical value of 3.84. Thus LD1 and LCV1 enter into a long-term relationship with LY. LI, however, is insignificant as likelihood ratio test statistic in this case is less than its 95% critical value. The exact level of significance or the probability value is given in brackets. So we conclude that all variables except LI enter into a long-run equilibrium relationship.

The above findings are in conformity with Dollar's main finding that controlling for the effect of real exchange rate variability and investment ratio, there is a negative relationship between distortion in the real exchange rate and real per capita income. The impact of other variables, however, is different from Dollar.

In case of Dollar, the impact of real exchange rate variability is negative while in our case it is positive. This point has been explained earlier; reforms of the 80s and 90s enabled more frequent adjustments in the real exchange rate as a result of which real exchange rate variability increased. At the same time, the real per capita income also accelerated during this period. In India, it appears, volatility of the exchange rate was a vehicle by which it brought closer to realistic levels.

But why does Dollar find a negative relationship between real exchange rate variability and growth of per capita income in cross-country context? It appears that during 1976-85, the ten-year period used by Dollar, the average coefficient of variation for the Latin American countries (.22) is much higher than that of the Asian countries (.11). Hence it seems that in Latin America higher volatility in the real exchange rate was a problem and is associated with low growth of per capita incomes in these countries; in Asia lower volatility is associated with higher per capita income growth.

The impact of investment ratio on real per capita income is positive in Dollar's findings. In our case it is positive but insignificant. This point needs further investigation. That is, we need to confirm the impact of investment ratio by using some other approach. This is done by using ARDL approach to cointegration.

5.3(c) The ARDL Approach to Cointegration

In this section we shall employ the procedure developed by Pesaran et al. (1996) and Pesaran and Shin (1995) to examine whether the long run impact of investment ratio on real per capita income is insignificant as suggested by Johansen's ML approach. One advantage of this procedure lies in the fact that it can be applied irrespective of whether the regressors are I(0) or I(1) and this avoids the pre-testing problems associated with standard cointegration analysis which requires the classification of variables into I(1) and I(0).

The implementation of the ARDL approach is well described in Microfit 4.0 manual (Pesaran and Pesaran, 1997). This procedure involves two stages. At the first stage the existence of the long-run relation between variables under investigation is tested by computing the F-statistic for testing the significance of the lagged levels of the variables in the error-correction form of the model underlying the ARDL approach. Since the asymptotic distribution of this statistic is non-standard, Pesaran et al. (1996) have tabulated the appropriate critical values depending on such factors as the number of regressors, presence of intercept or trend or both. They give two sets of critical values; one set assuming all the variables in the ARDL model are I(0), and another assumes all the variables are I(1). If the computed F-statistic falls outside this band, a conclusive decision can be made. If the computed statistic falls within this band, the result of the inference is inconclusive and depends on whether the underlying variables are I(0) or I(1). It is at this stage of the analysis that one may have to carry out unit root tests.

Our results suggest that the computed F-statistic in all the error-correction models (using different dependent variables) lies outside this band and therefore it was concluded that there exists a long run relationship between LY, LI, LD1 and LCV1.

At the second stage of this analysis one can estimate the long-run coefficients and make inferences about their values. The estimates of the long-run coefficients may differ depending upon the model selection criteria used. In our case, however, the Schwarz Baysian Criterion (SBC) and Akaike Information Criterion (AIC) give the same point estimates of the long-run coefficients as well as the estimates of the error-correction model. These results are reported in Tables 5.4a and 5.4b.

ARDL Approach to Cointegration

Table 5.4a
Long-run estimates

regressor	estimated coefficient	standard error	t ratio (prob.)
A	10.801	1.455	7.424 (.000)
LI	0.204	0.149	1.366 (.181)
LD1	-0.780	0.217	-3.598 (.001)
LCV1	0.079	0.046	1.708 (.097)

Table 5.4b
Error-correction model

regressor	estimated coefficient	standard error	t ratio (prob.)
ΔA	2.497	0.868	2.878 (.007)
ΔLI	0.047	0.048	0.973 (.338)
ΔLD1	-0.180	0.053	-3.381 (.002)
ΔLCV1	0.018	0.012	1.589 (.121)
e (-1)	-0.231	0.010	-2.317 (.027)
R^2 = 0.265; DW = 2.553			

where A = constant term
e (-1) = error-correction term

The point estimates of the long-run coefficients obtained by using ARDL approach (Table 5.4a) are quite similar to the ones obtained by Johansen's ML procedure (Table 5.3c). From Table 5.4a it can be seen that the impact of LI and LCVI on LY is positive while that of LD1 is negative. Further, the impact of LI is insignificant. These results are exactly the same as those obtained earlier by Johansen's approach. However, there is one major difference. In the results of the Johansen's approach there is no intercept in the cointegration relation while an intercept term appears in the cointegration relation in the results obtained by using ARDL procedure. The estimated coefficients of other regressors are quite similar in both the procedures.

The results of the error-correction model are given in Table 5.4b. Note that the error-correction term is significant and has the correct sign. This is a further evidence that real per capita income growth in the long run is affected by real exchange rate distortion and real exchange rate variability. In the short run real exchange rate distortion is significant; other variables are insignificant in affecting growth of real per capita income.

The log of investment ratio is insignificant in explaining real per capita income growth both in the long run as well as in the short run. This result is different from that obtained by Dollar if the entire sample of 95 countries is used. However, if the sample is restricted to 24 poorest countries our result is exactly the same as Dollar. For the poorest 24 countries Dollar found that investment ratio was insignificant in explaining real per capita income growth. For these countries, "the only thing that explains variation in growth rates...is real exchange rate distortion; real exchange rate variability and investment rate have virtually no explanatory power" (p. 538).

The result that the investment ratio is insignificant in explaining per capita income growth seems surprising and requires some explanation. It appears that this curious result, inter alia, may be the outcome of large unutilised capacity in Indian industry. Studies have shown that protectionist policies of the past have had an adverse impact on capacity utilisation in India. For example, Paul (1974) and Goldar and Renganathan (1991) have found that there is a negative relationship between effective

rate of protection and the rate of capacity utilisation across industries. It appears that protection from foreign competition insulates the domestic firms from any competitive pressures to reduce the cost of production. Moreover, protectionist policies do not allow imported inputs and intermediates to be readily available, resulting in large unutilised capacity. It is indeed striking that a country where the basic constraint on growth was thought to be the shortage of capital should end up with poor rates of capacity utilisation!

There are other important factors which may inhibit fuller utilisation of capacity such as infrastructural bottlenecks (like transportation, power and communication), shortage of domestic demand, incompatibility of the structure of capacities with the evolving structure of demand, management deficiencies as well as non availability of complementary factors of production. But there is no denying the fact that protectionist policies have played an important role in preventing fuller capacity utilisation.

Some studies have found that it is not capital accumulation which drives growth but growth which causes capital accumulation. For example, Lipsey and Kravis (1987) found that for five-year periods within the longer spans, the rate of growth was more closely related to capital formation rates in succeeding periods than to contemporary or succeeding rates. This suggests that the long-term relationship between the two variables was due more to the effect of growth on capital formation than to the effect of capital formation on growth. More recently, Bloomstrom et al. (1996), using Granger-causality technique to pooled time series and cross-section data consisting of a sample of 101 countries, found that economic growth precedes capital formation, but there was no evidence to suggest that capital formation precedes growth. They concluded that causality seemed to run in only one direction, from economic growth to capital formation.

All this, however, does not imply that policies should de-emphasise investment. Rather equal emphasis needs to be placed on policies aimed at removing the constraints which do not allow fuller utilisation of capacity. Investment may be

important but what one gets out of that investment is also equally important. A capital-scarce economy like India can ill afford the presence of large underutilised capacity.

5.4 Conclusions

1. Our outward orientation index D1, which measures the real exchange rate distortion, has a negative influence on the real per capita income growth. This conclusion holds irrespective of the methodology used. Does outward orientation lead to faster growth in India? The answer is yes. All the approaches used here, namely, Engle-Granger two-step method, Johansen's ML procedure and ARDL approach, attest to this basic conclusion that outward orientation leads to higher real per capita income growth in India. Therefore, one can regard this as a robust conclusion. This conclusion is also in consonance with Dollar (1992) who finds that "there is a significant negative relationship between distortion in the real exchange rate and growth of per capita GDP, after controlling for the effects of real exchange rate variability and investment level" (p. 525)

2. In Dollar (1992) the variability in the outward orientation index has a negative influence on the growth of per capita income. Our conclusion in case of India is the opposite. That is, the variability exercises a positive influence on the growth of real per capita income. A close look at the data in Table 5.1 shows that in India greater variability has been accompanied by acceleration in per capita income growth. This may partly reflect the fact that reforms of the 1980s and 90s allowed the real exchange rate to be frequently adjusted to more realistic levels leading to greater variability in D1. In India it appears that variability of real exchange rate was a vehicle by which distortion in real exchange rate was reduced.

3. Our study shows that role of investment ratio is insignificant in explaining growth of per capita income. This is true in the short term as well as in the long run. Again this conclusion is robust to the methodology used. This finding is different from the one obtained by Dollar for his entire sample of 95 countries.

4. For the poorest 24 countries Dollar finds that only real exchange rate distortion explains growth of real per capita income; other variables such as investment ratio and variability in the real exchange rate have insignificant impact. Our findings in this study are closer to Dollar's findings for the poorest 24 countries.

We can conclude by saying that our results are in consonance with Dollar's main finding that outward orientation leads to higher growth performance, controlling for the effects of investment ratio and real exchange rate variability. This finding is as much true for our time-series study for India as for Dollar's cross-country study.

CHAPTER 6

TRADE POLICIES AND EXPORTS: EMPIRICAL EVIDENCE FROM INDIA

Most empirical work on trade policy and growth in developing countries uses export growth as a proxy for trade policies. The problem with this approach is that the link between trade policy and export growth remains unestablished. Therefore, we have subdivided the subject of trade policy and growth into two parts. In the first part, we seek to analyse the relationship between trade policy and export growth. In the second part, we shall investigate the relationship between export growth and GDP growth. The first part of the relationship is the subject matter of this chapter. The second part of the relationship will be taken up in the next chapter.

The objective of this chapter is to take up the relationship between trade policy and real exports (RX). In doing so we shall use the following trade policy indices: real effective exchange rate (REER), black market premium (BMP), average tariff rate or collection rate (CR), and David Dollar's index of outward orientation (D1).

In testing the relationship between trade policy and real export growth, we shall make use of cointegration and error-correction modelling. We use cointegration because all the variables used by us are non-stationary (as we shall see later). Under these circumstances, classical OLS regression becomes inapplicable. Theoretically, this problem can be solved by taking the first difference of the I(1) variables. However, this approach will only capture the short-term impacts; long-term relationships between trade policy and exports are lost in the process. Ideally, one should have an approach where the short term can be combined with the long term. That is why cointegration and error-correction modelling is a suitable approach to use. More precisely, we shall make use of the Engle-Granger two-step approach and the Johansen's ML approach in a multivariate framework. In this chapter we shall not go into the methodological issues as they have been discussed earlier.

The scheme of this chapter is as follows. First, we take up the review of earlier studies on factors influencing developing countries' export performance. Then we take up the review of studies on India. Thirdly, we attempt to define the variables that have been used in our analysis to identify their data sources and to test them for the presence of unit roots. Next, we shall take up our own empirical findings regarding the impact of trade policy on exports in cointegration and error-correction framework. Finally, we shall make some concluding remarks. At the outset, it may be mentioned that perhaps none of the studies to date on factors influencing India's exports makes use of cointegration and error-correction modelling.

6.1 Review of Earlier Studies on Export Performance

In this section we shall investigate how the impact of trade policy on exports has been analysed in the literature. Let us start with the NBER study by Krueger (1978). It may be recalled that Bhagwati (1978) and Krueger (1978) attempted a five phase definition of trade regimes as these evolve over time. Using pooled data gathered from individual country studies, Krueger econometrically tested two relationships, the first of which was the relationship between trade policy and exports under different trade regimes.

As noted earlier, Krueger's econometric results showed that a more depreciated real effective exchange rate for exports (REERX) has a positive impact on non-traditional exports. Traditional exports, however, were not sensitive to changes in REERX. For both types of exports the dummy for phases IV and V was significantly positive suggesting that a move to a more liberalised regime also had a positive effect on export growth. However, REERX was more important then movements in the liberalisation ladder.

Another way of approaching the problem would be to investigate the determinants of export performance for an individual country in a time-series framework. In explaining the export performance of a country a number of factors may be at work on demand as well as on supply side. One, therefore, needs to investigate the relative

importance of both type of factors. It may be noted that this approach does not isolate the impact of trade policy; rather it investigates the relative importance of internal policies (including trade policy) and world demand in explaining export performance. Kravis (1970) and Love (1984) are good examples of this approach.

It may be recalled that Nurkse (1962) had propounded the view that trade was an engine of growth in the nineteenth century but this option was not available to the developing countries anymore as world trade had considerably slowed in the first half of the twentieth century. Nurkse did not oppose the principle that trade could act as an engine of growth but, due to unfavourable external conditions, he was pessimistic about its availability to the developing countries in the twentieth century.

Kravis (1970) opposed this trade pessimism of Nurkse. He argued that evidence does not support the view that trade played a dominant role in the success stories of the nineteenth century although it was one of the factors. Trade was never an engine of growth. A more appropriate way to describe the role of trade would be to say that it was a 'handmaiden' of successful growth rather than an autonomous engine of growth. Growth occurred mainly due to favourable internal factors and external demand represented an added stimulus which varied in importance from country to country and period to period. Those countries that have shared more fully in the expansion of world trade have done so not on the basis of favourable markets for their traditional exports but on the basis of their efforts to raise export shares and ability to diversify their exports.

Kravis identified three factors for export success: world market factor, competitiveness factor and diversification. World market factor is defined as the export performance of a country in response to changes in world demand for its traditional exports keeping constant its share in world market for each product. Competitiveness factor is the change in exports of a country if its share in world market changes, keeping total world trade for each traditional export constant. The diversification factor is calculated as a residual after taking account of the first two

factors. Kravis also defines an own performance factor which is nothing but the product of competitiveness factor and diversification factor.

The results suggested that export success did not primarily depend on the world market factor. The largest difference came from the competitiveness factor. That is, successful performers among the developing countries were differentiated from the less successful primarily by their increases in their shares in world markets for their traditional exports rather than by good fortune in world demand for their particular exports. The successful exporters tended also to have done better at diversification, but margins of superiority on this account were much smaller. Furthermore, the countries with high own performance indicators tended to be countries that had high growth rates.

On the basis of his decomposition analysis Kravis concluded that successful export performers were characterised by their abilities to compete in world markets and to reduce their dependence on traditional exports. However, Love (1984) notes that time-series analysis has generally been more persuasive than decomposition techniques. The latter suffer from the drawback that residuals play an important role in defining variables (to fully account for export performance). Love also notes the earlier time-series analyses, as in NBER studies, encountered difficulties in defining and quantifying explanatory variable sets. These studies ran into conceptual and practical difficulties involved in specifying the degree and structure of protection.

Given the conceptual and practical difficulties of previous time-series analyses and the residual nature of variables in the decomposition procedure, Love develops the same variable set as used by Kravis but defines and estimates it differently. A country's trade performance is determined by external market conditions for the traditional exports, the country's ability to compete in world markets, and the extent to which the country succeeds in diversifying the commodity composition of its exports. Indices for each of these are devised and used as explanatory variables in the regression model:

$$X_t = a_0 + a_1M_t + a_2C_t + a_3G_t + u_t \qquad t = 1...n$$

where X_t = index of total export earnings,

M_t = index of world market conditions for a country's traditional exports,

C_t = index of competitiveness of a country's traditional exports,

G_t = index of concentration capturing a country's dependence on a narrow range of exports. Diversification implies ability to reduce G_t

Trade pessimists would expect the external market conditions variable to perform well; their opponents would expect the export performance to be largely explained by abilities to compete and ability to diversify. The impact of a move towards a more liberal trade regime may be captured by introducing a dummy variable, D. The above regression equation then becomes:

$$X_t = a_0 + a_1M_t + a_2C_t + b_1DC_t + a_3G_t + b_2DG_t + u_t$$

where D = 1 for restrictive regime, 0 otherwise.

The coefficients on the competitiveness and concentration variables for a restrictive regime are $(a_2 + b_1)$ and $(a_3 + b_2)$ respectively, and for a liberal regime are a_2 and a_3 respectively. Whether a shift to a more liberal regime induces a significant change in behavioural relations may be examined by testing the statistical significance of b_1 and b_2.

On the basis of above model, Love found that export performance in most countries is relatively more sensitive to domestic factors, particularly the ability to compete in world markets than to external demand factor. External demand also emerges as a significant factor but the coefficients are not as large as on the competitiveness factor. The findings support the view of opponents of trade pessimism and emphasise the importance of policies designed to improve domestic supply conditions of exportables.

Riedel (1988), on the basis an econometric study on Hong Kong, also reaches a similar conclusion. Riedel points out that bulk of the time-series work has found relatively low price elasticities and high income elasticities of demand for LDC exports in developed countries. Riedel's findings contradict this widely held view that LDC export prospects depend crucially on the level of income and prosperity in developed countries. Using a fully specified simultaneous equation model for Hong Kong, Riedel finds that what primarily determines the volume of exports is Hong Kong's ability to compete in world markets on the basis of price; variations in real aggregate demand in developed countries have negligible effect on export volume.

6.2 Review of Studies on India

In his famous study, India's Export Trends, Singh (1964) challenged the notion of export pessimism implicit in the Indian economic policy framework during the 1950s. Singh explored whether the widely prevalent thesis of export pessimism had any empirical foundations. In a disaggregated study of India's exports, he showed that Indian exports were constrained by supply bottlenecks rather than demand. His finding was that export-fatalism thesis prevailing in Indian policy making circles did not have any solid empirical basis. In his view, the resulting faulty policies were largely responsible for stagnant Indian export earnings during the 50s.

A number of studies have shown that India's export performance was not hampered because of demand constraints. Aggregate and disaggregated studies have found the export elasticities to be greater than unity. Khan (1974) reported aggregate export elasticity estimates for 15 developing countries; and of the three countries having short-term price elasticity of demand for exports of more than unity, India had the highest figure of 1.7. Little and Joshi (1994) found that short term and long term export demand elasticity for India to be 1.06 and 3.03 respectively. Lucas (1988), in a disaggregated study of Indian exports, found that of the 18 commodities studied only four had a price elasticity of demand of less than one. The rest had considerably higher export demand elasticities, ranging from 1.1 for rubber to 6.2 for railway equipment.

Recent empirical research by Rangarajan (1991), Virmani (1991), Little and Joshi (1994) and Srinivasan (1998) has shown that the real effective exchange rate has played an important role in influencing exports. Virmani (1991) estimates supply and demand functions for exports in order to identify causative factors for India's export performance. He finds that the coefficient of real exchange rate index in the demand function is quite substantial and a 10% depreciation of the rupee relative to India's trading partners results in a 19% increase in the volume of exports.

Little and Joshi (1994) also estimate export demand and supply functions for India in a simultaneous equation framework. For the sake of completeness, they estimate a single equation model for exports which takes the following basic form:

$$X = f (RERsa, WY, DD)$$

where X denotes non-oil exports, RERsa measures the real effective exchange rate adjusted for export subsidies, WY is world income and DD is the pressure of domestic demand. They found that the short-run elasticity of exports with respect to the subsidy adjusted real exchange rate was between 0.67 and 0.83, rising to between 1.72 and 2.13 in the long-run. The real money excess demand variables (proxy for excess domestic demand) were found to be significant. The effect of world demand, however, was not found to be statistically significant at 5% level in any of the equations estimated.

Finally, Srinivasan (1998), writing in the commemorative volume in honour of Dr Manmohan Singh, estimated the following model:

$$\text{Log } X = f (\text{Log REER, Log Real GDP, Log World Exports})$$

where X is the value of India's exports in US dollars or India's share in world exports. Based on this model his findings are: (a) the elasticity of both export performance measures with regard to the real exchange rate was found to be negative implying that

real appreciation of the rupee adversely affects exports; (b) the coefficient of real GDP was positive and highly significant in both equations signifying that the supply effect of GDP dominated the domestic demand effect; and (c) the coefficient of world exports was found to be positive implying that higher world exports, as is to be expected, also mean higher demand for Indian exports.

The conclusion from the above studies is that Indian export competitiveness with respect to its trading partners, as measured by the real effective exchange rate, is an important factor influencing Indian export performance. World demand, although with a positive influence on exports, is not statistically significant. This is in line with studies by Kravis (1970) and Love (1984) which highlight the overriding importance of domestic factors as opposed to world demand in explaining a developing country's export performance. To quote Little and Joshi (1994), "...India is not an exception to the general presumption that the price competitiveness of exports is an important determinant of volume of exports, and that the relevant elasticities are more than adequate for a real depreciation to improve the current account..." (p. 275).

6.3 The Variables: Definition, Data Sources and Unit Root Tests

In this section we shall try to focus on the definition of various variables and the data used in constructing them. The trade policy variables used in this study are presented in Table 6.1.

Joshi and Little (1994) construct two indices for real effective exchange rate (RER). RER is defined as the export weighted nominal effective exchange rate (NER) adjusted for inflation differential between Indian wholesale prices and foreign wholesale prices. RER = NER × RWPI where RWPI is the index of ratio of Indian and foreign wholesale prices (export weighted). In constructing NER, nominal exchange rates (rupees per unit dollar) are taken from IMF's International Financial Statistics Yearbook (various years) and are then weighted by export shares of the ten most important industrial countries in India's export basket from 1979-1981.

Subsidy adjusted real effective exchange rate (RERsa) is calculated by using the formula RERsa = RER (1+ S) where S stands for export incentives as a proportion of exports. S has been constructed by taking cash subsidy for exports from the Indian Budget documents (various years) and combining them with the premium on import replenishment licenses.

Little and Joshi (1994) construct RER and RERsa indices for the period 1960-90 and 1960-88 respectively. Following the procedure used by Srinivasan (1988) we have extended these indices up to 1996 by using the predicted values of the regression of RERsa series (from Joshi and Little) on the unadjusted real effective exchange rate series from the Reserve Bank of India (1998). While Srinivasan extends the Joshi and Little series to 1994, we have done it to 1996. Following Little and Joshi, we shall use the subsidy adjusted real effective exchange rate for our empirical work (for obvious reasons) and call it REER (see Table 6.1).

Average tariff rate or collection rate (CR) is defined as the ratio of import duties to total imports. Tariff revenue is taken from the Budget documents, Ministry of Finance, Government of India (various years) and total imports are taken from Economic Survey, Ministry of Finance, Government of India, various years.

Black market premium (BMP) is calculated by taking the difference between the black market exchange rate and the official exchange rate and expressing the difference as a percentage of the official exchange rate. While the official exchange rate is taken from IMF's International Financial Statistics Yearbook (various years), the black market rate is taken from Pick's Currency Yearbook (now known as World Currency Yearbook), various issues.

As discussed earlier, we modified Dollar's (1992) methodology to construct an outward-orientation index (D1) for India. While Dollar used Summers and Heston international price-level data for constructing a cross-country index for a sample of 95 countries, we used Summers and Heston's latest data on India (downloaded from NBER website) for constructing a time-series index for the period 1950-92.

Table 6.1: Trade Policy Variables						
Year	**CR**	**REER**	**BMP**	**CVBMP**	**D1**	**CV1**
1950					157.89	
1951					147.70	
1952					136.89	0.098
1953			9.2	16.3	136.68	0.082
1954			6.2	20.7	121.14	0.057
1955			4.7	24.1	123.22	0.048
1956			7.5	55.7	129.97	0.030
1957			17.8	23.2	129.41	0.025
1958			13.9	20.1	125.65	0.025
1959			20.4	63.7	123.92	0.033
1960	14.0	155.61	48.9	4.2	122.92	0.042
1961	18.0	156.14	49.8	4.7	132.95	0.064
1962	21.0	156.61	54.5	8.7	134.41	0.088
1963	27.0	152.70	44.0	22.2	143.54	0.096
1964	29.0	166.16	63.7	17.6	155.14	0.088
1965	38.0	172.34	86.0	15.0	165.76	0.102
1966	24.0	165.28	81.8	51.7	137.86	0.140
1967	19.0	160.40	44.2	19.8	127.76	0.148
1968	19.0	153.47	35.3	12.3	117.59	0.084
1969	22.0	148.05	43.7	12.0	118.54	0.055
1970	28.0	149.63	67.6	9.7	111.70	0.027
1971	34.0	147.76	70.9	13.8	112.38	0.065
1972	41.0	141.83	41.2	31.6	116.41	0.090
1973	31.0	135.01	19.4	22.9	130.70	0.100
1974	28.0	140.15	14.9	42.7	135.03	0.113
1975	25.0	127.62	14.8	74.0	107.19	0.125
1976	28.0	112.42	15.9	19.9	105.27	0.112
1977	27.0	113.64	13.3	17.1	106.65	0.049
1978	34.0	100.00	18.3	29.9	109.00	0.065
1979	31.0	101.37	20.3	28.5	118.76	0.061
1980	26.0	109.72	9.8	23.9	121.24	0.080
1981	32.0	112.50	14.5	36.9	107.22	0.107
1982	38.0	109.64	26.0	30.3	99.59	0.134
1983	38.0	114.41	17.8	41.5	94.84	0.100
1984	45.0	114.56	23.9	20.0	85.14	0.081
1985	84.0	111.55	16.6	38.6	85.57	0.053
1986	56.0	95.33	9.7	33.3	82.73	0.036
1987	60.0	86.73	16.7	40.0	87.81	0.070
1988	56.0	81.69	24.8	24.7	79.97	0.074
1989	51.0	79.14	14.2	25.5	73.14	0.148
1990	48.0	74.05	9.6	31.1	75.27	0.173
1991	44.0	58.87	15.0	27.6	57.81	
1992	37.0	50.07	18.4	24.7	52.97	
1993	30.0	55.99	5.2	187.3		
1994	29.0	59.73				
1995	29.0	56.60				
1996	31.0	57.97				

Where CR = Average tariff rate (import duties as a percentage of total import value)
REER = Real effective exchange rate after adjusting for export subsidies
BMP = Black market premium, CVBMP = Coefficient of variation of BMP
D1 = Dollar's index of real exchange rate distortion, CV1 = Coefficient of variation of D1

Real exports (RX) are obtained by dividing the rupee exports from DGCI&S, Ministry of Commerce, Government of India, by the wholesale price index. In our view, the wholesale price index is better for our purpose as there are problems with the alternative price indices such as the consumer price index or the unit value index. These problems are explained below.

Marshall and Jung (1985) have used the export price index (where available) and the consumer price index when this was not available to convert nominal exports into real exports. They point out that there are difficulties with both price indices. The consumer price index fails to pick up changes in terms of trade. Export price index is frequently not a constant basket price index but a unit value index (as is the case with India). They also find that where exports are deflated by consumer price index for every country, the results are less favourable to export promotion strategy than otherwise. Keeping above considerations in mind, we have taken the wholesale price index.

There are, however, some added considerations in the Indian case. Firstly, the consumer price index in India has three variants: the consumer price index for agriculture workers, the consumer price index for industrial workers and the consumer price index for non-manual urban employees. It is not clear which of these should be taken if one decides to use the consumer price index for deflating the nominal export series. Secondly, the actual export prices are likely to be closer to wholesale prices rather than consumer prices for the simple reason that world trade occurs in big quantities rather than smaller ones. Finally, as some commentators (for example, Bhalla, 1999; Ramesh, 1999) have noted, the consumer price index for industrial workers, which is the most widely used, is a political index in India as government pay-outs to its employees as well as industrial wages and salaries are linked to this index resulting in a vested interest which keeps this index inflated as compared to the wholesale price index. From this discussion it emerges that the wholesale price index is not inferior (if not better) to any other index discussed above to deflate the nominal export series.

Index number of World real GDP (WGDP) is used as a proxy for international demand and the data for this are taken from International Financial Statistics, various issues. Of course one can also use world exports as a measure of international demand but we have not done so and following Little and Joshi (1994) we have taken the earlier measure. In our view, world real GDP is a better proxy for world demand as world exports, as they actually happen, are the outcome of supply and demand forces and, therefore, are equilibrium values. What we are concerned with is the planned world demand each year and not the equilibrium purchases of exports by the entire world. World real GDP, on the other hand, constitutes potential to purchase and hence planned demand.

The proxy for the pressure of excess domestic demand is the ratio of M1 to GDP. The log of this ratio is used in the cointegrating equation so that first difference of this ratio in the error-correction model would measure the excess of monetary growth over GDP growth.

Before attempting cointegration analysis, the above variables have to be tested for the presence of unit root. This can be done by the Augmented Dickey- Fuller (ADF) test. Results are given in Table 6.2a which shows that all the level variables exhibit non-stationarity. This is clear from the fact that the calculated ADF statistic in all cases is more than the 95% critical value. The first difference of the level variables was found to be stationary as calculated ADF is less than the 95% critical value in all cases. From this it was concluded that the level variables were I(1) as the first differences were I(0).

6.4 Real Effective Exchange Rate (REER) and Export Growth

Little and Joshi (1994), estimated the following model to test the relative importance of domestic factors in relation to world demand:

$X = f(RERsa, DD, WD)$

Engle-Granger Two-step Approach

Table: 6.2a
ADF Tests for Unit Roots

	variables	test statistic		95% critical values	
		levels	first differences	levels	first differences
1	LRX	-1.780(0)	-5.534(0)	-3.522	-2.936
2	LWGDP	-2.809(2)	-4.014(0)	-3.562	-2.963
3	LM1GDP	-1.166(0)	-6.369(0)	-2.959	-2.963
4	LREER	-0.338(0)	-4.175(0)	-2.959	-2.963
5	LCR	-1.774(0)	-5.415(0)	-2.959	-2.963
6	LBMP	-1.357(3)	-6.071(1)	-2.947	-2.950
7	LD1	-1.039(0)	-5.108(0)	-2.942	-2.945

where L before a variable stands for the natural log

RX = Real Exports
WGDP = Index Number of Real World GDP
M1GDP = Narrow Money (M1) to GDP ratio
REER = Real Effective Exchange Rate (adjusted for export subsidies)
CR = Average Tariff Rate or Collection Rate (= import duties/imports)
BMP = Black Market Premium(difference between black and official exchange rate as a percentage of the official exchange rate)
D1 = Dollar's index of outward orientation

Notes:
1. Computations were performed by using Microfit 4.0 (see Pesaran and Pesaran, 1997).
2. Terms in the brackets show the no of augmentations or lags (k) in ADF regressions.
3. k is chosen with the help of the model selection criteria such as Akaike Information Criterion (AIC), Schwarz Baysian Criterion (SBC) and Hannan-Quinn Criterion (HQC).
4. For the first two level variables, ADF test is performed using a time trend.
5. Microfit 4.0 automatically gives the critical values reported above. They have been generated by Monte Carlo simulations and taken from Dickey and Fuller (1979).

Table: 6.2b
Residual Based Test for Cointegration

Cointegrating Regression	time period	$\overline{R}^2$	CRDW	ADF statistic	90% critical value
LRX=f(LREER,LWGDP,LM1GDP)	1960-96	0..971	0.789	-3.802(2)	-3.98*

*90% critical value for ADF statistic for m = 4 (where m is the no of parameters) in the vicinity of 50 observations is -3.98.

Notes:
1. The ADF critical values are different from the ones used in Table 6.1a. They have been taken from MacKinnon (1991).
2. The critical value of CRDW (Cointegrating Durbin Watson) in the vicinity of 50 observations is 0.78 at 5% and 0.69 at 10% levels of significance (Engle and Yoo, 1987)
3. In the cointegrating equation CRDW < R^2. Granger and Newbold (1974) have suggested that DW < R^2 is good rule of the thumb to suspect spurious regression. However in the case of a cointegrating regression null is DW = 0 rather than the usual DW = 2.

Where X = real exports

RERsa = subsidy adjusted real effective exchange rate

DD = excessive pull of domestic demand; and

WD = world demand

We modified the above model to make it suitable for cointegration and error-correction modelling. Firstly, we took the natural log of above variables so that in the error-correction representation the first differences would reflect the growth rates. Secondly, Joshi and Little define excess domestic demand as the excess of monetary growth over GDP growth. We define it as the ratio of narrow money (M1) to GDP. In the cointegrating equation the log of this ratio is taken so that in the error-correction model the first difference of this can be interpreted as the excess of monetary growth over GDP growth. Finally, Little and Joshi take 1960-1988 as the period of their study while we took a longer period up to 1996.

As pointed out earlier Joshi and Little define two real effective exchange rate indices one of which is adjusted for export subsidies. It is this particular index we shall use in our empirical work as it is more comprehensively defined. We shall first use Engle-Granger two step approach to estimate the above model. To check the robustness of our results, we shall re-estimate the above model using Johansen's ML procedure.

6.4(a) Engle-Granger two-step approach

We estimated a cointegrating regression of the following form:

$$LRX = a + b_1 LREER + b_2 LWGDP + b_3 LM1GDP + u$$

Note that we have taken natural log of the various variables. This has been done due to two reasons. First, this allows us to interpret b_1, b_2 and b_3 as long-term elasticities. Secondly, their first differences in the error-correction model can be interpreted as growth rates. Estimation of the above equation yields the following result

$$\hat{LRX} = 15.461 - 1.439\text{LREER} + 0.568\text{LWGDP} - 0.0141\text{LM1GDP}$$

$\overline{R}^2 = 0.971$ DW = 0.788

Residual based (ADF) test (Table 6.2b) of cointegration showed that the variables in the cointegrating equation almost cointegrate at the 10% level. Cointegrating DW is quite high and is greater than its 95% critical value of 0.78. This suggests that CRDW is significantly different from zero and, therefore, the variables of the above equation are cointegrated.

Note that all the variables above have the expected signs. REER coefficient is negative, signifying a negative relationship between real exports and real effective exchange rate. In other words, an appreciation of the real value of the domestic currency vis a vis those of major trading partners leads to a decline in export performance in real terms. The sign of the world GDP coefficient is positive, implying that higher world demand has a positive influence on real exports. The sign of the excess domestic demand variable is negative because one would expect that excess monetary growth at home would exert a negative influence on real exports as less domestic supply would be available for exports.

Note that coefficients of various variables can be interpreted as elasticities. Thus the long-term partial elasticity of real exports with respect to REER is -1.44; this means that controlling for the effect of other variables, a 1% fall in the REER index leads to 1.4% increase in real exports. The partial elasticity of real exports with respect to index of world GDP is 0.57; which implies that a 1% increase in world GDP index leads to about 0.6% increase in real exports. It appears that the REER index exercises more influence over Real exports than world GDP index.

If the above model includes REER as the only explanatory variable, then the elasticity of real exports with respect to REER jumps to nearly 2. The results of the bivariate regressions are not reported here. The point which emerges from them is that the Indian exports are quite sensitive to price competition and the elasticity of real exports

with respect to REER is quite large to suggest that the Indian exports face quite elastic world demand. Export pessimism of the past seems to have no empirical basis.

In the next stage, the error-correction representation of the above model was estimated. To start with, the differenced terms used had one period lag. This was then tested down to make the model more parsimonious.

$$\Delta LRX = 0.043 - 0.815\Delta LREER2 + 0.400\Delta LWGDP + 0.115\Delta LM1GDP +$$

p values (0.441) (.001) (.736) (.673)

$$0.340\Delta LREER2(-1) - 0.697\Delta LWGDP(-1) - 0.531\Delta LM1GDP(-1) +$$

(.255) (.564) (.059)

$$0.295\Delta LRX(-1) - 0.441e(-1)$$

(.138) (.019)

$\overline{R}^2 = 0.322$ DW = 2.249

Simplifying the above equation yields:

$$\Delta L\hat{R}X = 0.046 - 0.769\Delta LREER - 0.557\Delta LM1GDP(-1) - 0.281e(-1)$$

p values (.004) (.000) (.034) (.033)

$\overline{R}^2 = 0.356$ DW = 1.728 LM $\sim \chi^2_{(1)} = .687(.601)$

The Lagrange Multiplier test showed that there is no residual serial correlation in the above equation. Note that in the short-run domestic factors such as competitiveness (REER) and excessive monetary growth affect export growth. International demand has no significant role in the short term. Short-term monetary growth negatively affects export growth with a lag of one period. This may be because excessive monetary expansion takes time to work itself out.

As noted earlier, the above analysis assumes that there is one cointegrating vector. There is no way to confirm this using Engle-Granger approach. Secondly, coefficients

of the cointegrating equation cannot be interpreted in the usual way as their distributions are non-standard (because of the presence of I(1) variables). Therefore, we now proceed to Johansen's ML procedure.

6.4(b) Johansen's Maximum Likelihood Approach

As noted earlier in the last chapter, Johansen's procedure has a number of advantages over Engle-Granger two-step approach. Also, while applying Johansen's procedure two issues have to be addressed. The first concerns the appropriate lag length of the underlying VAR model so that the error term has the Gaussian properties. The second is the issue of which deterministic components should appear in the cointegration relation.

We used Akaike Information criterion to choose the order of VAR as 3. The residuals of the individual VAR equations were then inspected for the presence of autocorrelation, non-normality etc. The diagnostic tests showed that residuals were indeed Gaussian.

Regarding the presence of deterministic components in the cointegration relation, the choice of the most appropriate model boils down to three realistic cases: model 2, which includes intercept in the cointegration relations; model 3, which does not allow any deterministic components in the cointegration space; and model 4 which allows for trend in the cointegration space. As mentioned earlier, it is not easy to decide which of these models should be chosen on a priori grounds. Thus Johansen (1992) suggested that hypothesis of both the rank order and deterministic components could be tested jointly on the basis of Pantula principle.

Johansen's Maximum Likelihood Approach

Table 6.3a Cointegration rank and model selection: Trace statistic			
r	**model 2**	**model 3**	**model 4**
0	82.90 (53.48)	61.52 (48.88)	88.81 (63.00)
1	38.61 (34.87)	**20.51** (31.54)	47.61 (42.34)
2	16.62 (20.18)	10.87 (17.86)	13.35 (25.77)
3	6.98 (9.16)	2.61 (8.07)	4.55 (12.39)

Table 6.3b Cointegration rank and model selection: Maximal Eigenvalue statistic			
r	**model 2**	**model 3**	**model 4**
0	44.30 (28.27)	41.01 (27.42)	41.20 (31.79)
1	**21.99** (22.04)	9.64 (21.12)	34.26 (25.42)
2	9.64 (15.87)	8.26 (14.88)	8.80 (19.22)
3	6.98 (9.16)	2.61 (8.07)	4.54 (12.39)

Table 6.3c Long-run estimates			
variable	**estimated coefficients**	**standard error**	**LR statistic (prob.)**
LREER	-1.798	0.159	32.72 (.000)
LWGDP	1.392	0.301	22.93 (.000)
LM1GDP	-0.350	0.136	9.25 (.002)

Table 6.3d Error-correction model					
regressor	**coefficient**	**estimate**	**t ratio (prob.)**	**restriction**	**Wald test (prob.)**
A		6.676	**2.743**(.011)		
ΔLRX(-1)	b_1	0.079	0.402(.691)		
ΔLRX(-2)	b_2	0.292	1.543(.136)	$b_1=b_2=0$	2.487(.288)
ΔLREER(-1)	b_3	0.118	0.400(.693)		
ΔLREER(-2)	b_4	0.676	**1.991**(.058)	$b_3=b_4=0$	3.964(.138)
ΔLWGDP(-1)	b_5	-0.401	-0.249(.805)		
ΔLWGDP(-2)	b_6	0.923	0.621(.541)	$b_5=b_6=0$	0.368(.825)
ΔLM1GDP(-1)	b_7	-0.857	**-2.226**(.036)		
ΔLM1GDP(-2)	b_8	-0.343	-0.764(.452)	$b_7=b_8=0$	**5.382**(.068)
e(-1)	λ	-0.511	**-2.685**(.013)		
$\overline{R}^2 = 0.148$, DW = 1.917, LM ~ $\chi^2_{(1)} = 0.011$ (.917)					

As in the last chapter, testing strategy begins from the most restrictive to less restrictive till the null is accepted for the first time. Following this procedure it is seen that trace statistics selects model 3 while maximal eigenvalue selects model 2 (Tables 6.3a and 6.3b). It was noted earlier, by Cheung and Lai (1993) that trace test shows more robustness to both skewness and excess kurtosis than maximal eigenvalue test. Following this advise, we therefore base ourselves on the trace test. Note that maximal eigenvalue test does not reject model 3, although model 2 is accepted first. So we conclude that there is one cointegrating vector and model 3 is our preferred choice. This implies that there is no constant in the cointegration relation.

Based on model 3 and r = 1, the point estimates of long-run coefficients are shown in Table 6.3c. It can be seen that LREER and LM1GDP have a negative relationship with LRX, while LWGDP has a positive impact on LRX. This confirms the earlier results from Engle-Granger procedure. It can also be seen that LR statistic in all the cases is more than the 95% critical value of 3.84. Therefore, the point estimates are highly significant and all of them enter into long-term equilibrium relationship. Again, coefficient on LREER is greater than on LWGDP, implying that the impact of price competitiveness on real exports is probably greater than world demand. All this confirms our earlier findings. These findings are in line with studies by Kravis (1970), Love (1984) and Riedel (1988) which highlight the overriding importance of domestic factors such as export competitiveness in explaining export performance.

Table 6.3d shows the error-correction model. It can be seen that error-correction term is significant and has the expected sign. Note that it is quite large indicating that equilibrium once shocked has a tendency to get restored fairly quickly. In the short term the only significant variable is the growth of excessive monetary demand, as the Wald Test shows. Although the second lag of the growth of REER is significant in the short term (t-test), REER's overall influence is insignificant in the short run (Wald test). Growth of world demand has no impact on growth of real exports in the short-run. While world demand seems important in the long term, domestic factors like excessive monetary growth are important in the short as well as the long term. This

further confirms that domestic factors are more important as opposed to world market conditions in explaining export performance.

Our results show that short-term elasticity of real exports with respect to REER is -0.68 while the long-term elasticity is -1.8. These are similar to the elasticity coefficients reported by Little and Joshi (1994). They found that the "elasticity of exports with respect to the real (subsidy adjusted) exchange rate is between 0.67 and 0.83 in the short run, rising between 1.72 and 2.13 in the long run" (p. 291-2).

6.5 Conclusions

1. The long-run elasticities of exports with respect to the real effective exchange rate and world GDP are significant and sufficiently large. Demand is not a constraining factor in Indian export performance. Therefore, earlier policies based on export pessimism seem to have no empirical foundations.

2. While domestic demand and REER have long-term as well as short-term impact on export growth, WGDP has only long-term impact. Moreover, the long-term elasticity of exports with respect to REER is greater than elasticity with respect to WGDP. Thus factors like domestic competitiveness score over world demand in explaining export performance. This conclusion is similar to the one reached by Kravis (1970), Love (1984) and Riedel (1988).

3. Excessive domestic demand exercises a negative influence on export growth in the short as well as long term. This underlies the importance of curbing excessive monetary expansion in promoting export growth in India.

4. Multivariate model was tried out with alternate trade policy variables such as Dollar's index (D1), black market premium (BMP) and average tariff rate (CR). But the results of cointegration analysis were not very encouraging. The question is why REER scores over Dollar's index (D1) in explaining export performance? The answer may lie in the way both indices are constructed. For Dollar's index price indices have

the same weights for each country; REER is constructed taking export weights of top ten trading partners. Thus REER appears better in explaining real exports.

5. As a policy response, above analysis calls for an aggressive exchange rate policy which allows the nominal exchange rate to adjust for the differential in the rates of inflation between India and its trading partners. The above policy can be combined with a policy of low domestic inflation, by a suitable use of monetary and fiscal policies, as inflation erodes competitiveness of exports. Put differently, there is no virtue in keeping REER artificially inflated so as to keep it out of line with the fundamentals of the economy.

6. REER's influence over exports is in line with that observed by other researchers such as Rangarajan (1991), Virmani (1991) and Little and Joshi (1994). None of them, however, used cointegration and error-correction modelling to reach their conclusions.

CHAPTER 7

EXPORT GROWTH AND ECONOMIC GROWTH: AN INVESTIGATION OF CAUSALITY IN INDIA

As we saw earlier, there is overwhelming evidence in favour of the export-led-growth hypothesis if one looks at cross-section studies alone. The results of studies by Michaely (1977), Heller and Porter (1978), Balassa (1978), Kavoussi (1984), Ram (1985, 1987), Feder (1982) and Tyler (1981) support the view that export growth promotes overall economic growth. One serious drawback of such studies, however, is that the issue of causality between export growth and GDP growth is not addressed. Most of the cross-country studies using regression framework assume (rather than establish) that causality runs from export growth to GDP growth. However, it is possible that faster growing economies have a more dynamic export sector. It could also be possible that that there is a two-way relationship between export growth and GDP growth. Therefore, the issue of direction of causality has to be directly addressed. This is only possible if one moves away from cross-country framework to a time-series analysis.

Recently, there has been a spurt in time-series studies to address this issue of causality. The main studies in this area are those by Jung and Marshall (1985), Chow (1987), Hsiao (1987), Bahmani-Oskooee et al (1991) and Love (1994). These studies, using Granger (1969)/Sims (1972)/Hsiao (1987) procedures to test causality, have not however provided uniform support for the export-led-growth hypothesis. To be fair, these studies do find some evidence in favour of export-led growth. But this evidence is far from conclusive. At best the evidence can be regarded as mixed.

The objective of this chapter is to investigate the issue of causality in India. For this we shall use Granger's procedure. The period of our study is 1950-1996. Before proceeding to apply Granger-causality technique the export and GDP variables have to be tested for cointegration; if cointegration is confirmed, then Granger's procedure has to be modified and cast in terms of cointegration cum error-correction modelling.

The traditional causality methods become inapplicable and may lead to misleading conclusions. If, on the other hand, there is no cointegration between real exports and real output (as is the case in India, as we shall see later), the standard Granger's procedure will be applied.

The chapter is organised as follows. First, we shall discuss the various concepts of causality discussed in the literature. Secondly, we shall review the earlier literature on the subject. Next, we shall briefly outline the methodology used by us in the Indian case. Finally, we shall present our empirical findings.

7.1 Definition of Causality

We start by defining Granger's (1969) concept of causality. X is said to Granger-cause Y if Y can be predicted with greater accuracy by using past values of X rather than not using such past values, all other relevant information in the model remaining the same. Consider the equation:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \beta_1 X_{t-1} + \beta_2 X_{t-2} + u_t$$

If $\beta_1 = \beta_2 = 0$, X does not Granger cause Y. If, on the other hand, any of the β coefficients is non-zero, then X does Granger cause Y. The null hypothesis that $\beta_1 = \beta_2 = 0$ can be tested by using the standard F-test of joint significance. Note that we have taken two-period lags in the above equation. In practice, the choice of the lag length is arbitrary. Varying the lag length may lead to different test results. As a practical guide, one can include as many lags as are necessary to ensure non-autocorrelated residuals.

Another well-known test for causality is that of Sims (1972). This makes use of the notion that the future cannot cause the present. Consider another equation:

$$X_t = a_0 + a_1 X_{t-1} + a_2 X_{t-2} + b_1 Y_{t+2} + b_2 Y_{t+1} + b_3 Y_{t-1} + b_4 Y_{t-2} + e_t$$

Here X rather than Y is the dependent variable and leading values of Y such as Y_{t+1} and Y_{t+2} are included. Here the F-test is H_0: $b_1 = b_2 = 0$. Rejection of H_0 must imply that X causes Y (because non-zero b_1 and b_2 cannot be interpreted as implying that causation runs from leading values of Y to X). Since the Sims test includes leading values, it has the disadvantage of using more degrees of freedom as compared to the Granger test.

Bahmani-Oskooee et al (1991) and Love (1994) have made use of the two-stage procedure developed by Hsiao (1987). It is argued that the Granger test suffers from a number of drawbacks such as arbitrariness in the choice of lags and in the level of significance. To overcome these shortcomings, the Hsiao synthesis is used which combines Granger's procedure with Akaike's Final Prediction Error (FPE). Hsiao's procedure allows for the identification of the optimum lag length for each variable employed in the Granger test by making use of FPE criterion and eliminates ambiguity in the level of significance.

Bahmani-Oskooee and Alse (1993) have criticised the studies based on the standard causality procedures outlined above on the grounds that these procedures cannot be applied without taking into account the cointegrating properties of the concerned variables. If exports and GDP variables are cointegrated then the standard Granger test is inapplicable and may lead to misleading results. Therefore, they recommend cointegration and error-correction modelling to combine the short-term as well as long-term causal impacts.

7.2 Review of Earlier Studies on Causality

Chow (1987) adopted Sims procedure to investigate the issue of causality between export growth and manufactured output growth. He found that there was a two-way causality in the cases of Brazil, Hong Kong, Israel, Korea, Singapore and Taiwan; one-way causality from export growth to output growth in case of Mexico; and no causality for Argentina.

Jung and Marshall (1985), on the other hand, use the Granger concept of causality. They find that the thesis of export-led growth is supported in only four out of thirty-seven countries studied. As mentioned above, Bahmani-Oskooee et al (1991), combine Granger causality with Akaike's Final Predictor Error (FPE) and find some support in favour of export-led-growth hypothesis, although the evidence at best is inconclusive. Love (1994) also combines Granger's concept of causality with FPE and investigates the two engines of growth hypothesis: exports as an engine of growth and government sector as an engine of growth. He uses the Heller and Porter (1978) approach of defining GDP net of exports. Once this is done, he finds weak support for exports as an engine of growth; and very little evidence consistent with a government-led-growth hypothesis. Dodaro (1993) investigates the issue of causality by employing Granger's approach to a larger set of countries. Using a large sample of 87 countries, he finds very weak support for the contention that export growth promotes GDP growth. Support for the alternate contention that GDP growth promotes export growth is also weak, although somewhat stronger than the former.

Bahmani-Oskooee and Alse (1993) point out that there are three major shortcomings of the above time-series studies. First, none of these studies have checked the cointegrating properties of the time-series variables (such as exports and GDP) involved. Standard Granger or Sims tests are only valid if the original time series are not cointegrated. If the time series are cointegrated, then any inferences based on the traditional time-series modelling techniques will be invalid. As pointed out by Granger (1988), this is because traditional causality tests would miss out some of the 'forecastability' and hence reach incorrect conclusions about causality. Secondly, traditional tests use growth of GDP and that of exports and this is akin to first differencing. This filters out long-run information; to remedy the situation cointegration and error-correction modelling have been recommended to combine the short-term as well as long-run information. Finally, all earlier studies have used annual data and, therefore, the lack of causality may have been the result of temporal aggregation.

Bahmani-Oskooee and Alse (1993) take into account all these issues. Their study uses cointegration and error-correction modelling; and employs quarterly instead of annual data for the eight countries studied. They find that there is a strong empirical support for two-way causality between export growth and GDP growth in 8 out of 9 countries. The only exception was Malaysia where exports and GDP were not found to be cointegrated and, therefore, the methodology of cointegration and error-correction modelling could not be applied.

However, subsequent studies using cointegration and error-correction modelling framework, as proposed above, have found a strong support for the export-led-growth thesis for Malaysia. While Ghatak et al. (1997) find strong support for export-led-growth thesis for Malaysia, Doraisami (1996) finds strong support for bi-directional causality between export growth and output growth. In both these studies, real exports and real GDP are cointegrated for Malaysia. While both these studies used annual data, Bahmani-Oskooee and Alse study used quarterly data.

7.3 Review of Studies on India

The earlier studies on India suggest insignificant causality in either direction. For example, Jung and Marshall (1985) report insignificant F-statistic for $x \rightarrow y$ as well as $y \rightarrow x$ although the sign is positive in both cases. Similarly Dodaro (1993) also reports insignificant F-statistic in both cases but the sign of the second relationship is reported to be negative. Both studies, however, are quite dated as Marshall and Jung take 1960-1979 and Dodaro 1967-1986 as their study period for India. Indian economy has come a long way since then and the proportion of trade or exports to GDP have considerably increased. The Indian economy, particularly during the 1990s, has opened up considerably as compared to any time in the past. This is clear from the fact that exports as a percentage of GDP at current market prices increased from 4.4% in 1985-86 to 9.4% in 1996-97; while the imports to GDP ratio increased from 8.1% to 13.8% during the same period. As a result, the Indian economy became much more open over this period with the total trade to GDP ratio almost doubling from 12.5% to 23.2%. So it is possible that in view of its greater openness, real exports

have begun to affect real GDP and vice versa. The issue of causality needs to be investigated by using much longer time period.

Recent work on the direction of causality in India does not agree with the 'no causality' result of the above studies. Mallick (1996), uses the annual data for the period 1950-92 and employs Engle-Granger cointegration cum error-correction procedure for his study. He found that there is a strong cointegration between income and exports and the direction of causality runs from income growth to export growth (i.e., growth-led export). While the Granger-causality tests, in his study, are sensitive to the lag length chosen and do not show consistent causal flow from income growth to export growth, the results of error-correction model show that causation runs from income growth to export growth (as error-correction term is significant) irrespective of the lag length chosen. This seems to suggest that the causality found by Mallick is a long-term phenomenon. One major drawback of this study seems to be that he does not employ the concept of parsimony in the choice of the best model. He presents a number of results depending on differing lag lengths. If white noise residuals are achieved by smaller number of lags, there is no point in estimating the same model with larger number of lags. From the results presented by him, it is not clear which would be the best choice from the point of view of parsimony.

Marjit and Raychaudhuri (1997), using Granger's causality procedure, have also found that the direction of causality is from GDP growth to export growth. However, Marjit and Raychaudhri did not test the cointegrating properties of export and income variables used. Their findings, as pointed out by Singh (1998), can be questioned on both theoretical and empirical grounds. Firstly, the authors did not test the cointegrating properties of the variables involved. Secondly, according to Singh, the role of export growth in overall growth cannot be denied during 1993-94 to 1995-96 when export growth averaged 20% per annum in terms of US Dollars.

In a recent study, Dhawan and Biswal (1999) investigate the direction of causality for the period 1961-93 in a multivariate framework by specifying terms of trade as an additional variable. Employing Johansen's maximum likelihood cointegration

procedure, their results suggest that GDP and terms of trade jointly Granger cause exports in the short-run as well as in the long-run. The causality from exports to GDP, on the other hand, was found to be a short-run phenomenon. Thus their results support a bi-directional causality. Our findings, as we shall soon see, also suggest that export growth and GDP growth are interlocked in a two-way relationship rather than a one way relationship from GDP growth to export growth as suggested by Mallick or Marjit and Raychaudhuri. Our study, it may be noted, uses longer time period (1950-96) than any of the studies on India so far.

7.4 Methodology

The first step, in our methodology, is to determine whether the variables used by us are stationary or non-stationary. If they are non-stationary, then the issue is to what degree they are integrated. This can be addressed by the Augmented Dickey-Fuller (ADF) tests described earlier. The cumulative distribution of ADF is provided by Fuller (1976). If the calculated ADF statistic is less than its critical value from Fuller's table, then X is said to be stationary or integrated to the order zero, i.e., I(0). If this is not the case, then the ADF test is performed on the first difference of X (i.e., ΔX). If ΔX is found to be stationary then X is I(1). In practice, however, a number of econometric packages can be used to perform this test which also give the critical value of the ADF statistic. We shall use Microfit 4.0 to perform our computations.

If two variables X and Y are both I(1), then the next step is to find out whether they are cointegrated. This can be done by estimating the following cointegrating equations by OLS and testing their residuals for stationarity.

$$X_t = a + bY_t + u_t$$

$$Y_t = \alpha + \beta X_t + u'_t$$

If X and Y are both I(1), then for them to be cointegrated u_t and u'_t should be I(0). Once it is established that two variables are cointegrated, the next issue is to

determine which variable causes the other. Before the advent of cointegration and error-correction modelling, the standard Granger or Sims tests were used widely to determine the direction of causality. However, as we have seen, the standard Granger and Sims methods are likely to be misleading if the concerned variables are cointegrated. This is because the standard Granger or Sims tests do not contain an error-correction term. This provides an additional channel for causality to manifest itself. The error-correction models are formulated as follows:

$$\Delta X_t = a_0 + b_0 u_{t-1} + \sum_{i=1}^{M} c_{oi}\,\Delta X_{t-i} + \sum_{i=1}^{N} d_{oi}\Delta Y_{t-i} + e_t$$

$$\Delta Y_t = a_1 + b_1 u'_{t-1} + \sum_{i=1}^{M} c_{1i}\Delta Y_{t-i} + \sum_{i=1}^{N} d_{1i}\Delta X_{t-i} + e'_t$$

where the error-correction terms u_{t-1} and u'_{t-1} are the stationary residuals from the cointegrating equations. By introducing error-correction terms in the above equations, an additional channel is opened up through which causality can be detected. For example, in the first equation Y is said to Granger-cause X not only if d_{oi}'s are jointly significant (through the F-test) but also if b_0 is significant. Thus error-correction models allow for the fact that Y Granger-causes X as long as the coefficient of the error-correction term is significant even if d_{oi}'s are not jointly significant.

In the above analysis, it is important to distinguish between short-term and long-term causality. Jones and Joulfaian (1991) interpret the lagged changes in the independent variable to represent short-run causal impact, while the error-correction term is interpreted as representing the long-run impact. Bahmani-Oskooee and Alse (1993) also use the same interpretation in their empirical work.

In autoregressive models represented by above equations where there is more than one lag on the right hand side, one has to devise an appropriate strategy for choosing the optimum number of lags on each variable. There could be various ways of going about it. One way would be that followed by Hsiao (1987), Bahmani-Oskooee et al

(1991), and Love (1994), as noted above, by employing a Final Prediction Error criterion to identify the optimum number of lags. Another way would be to include sufficient number of lags in the right hand side of the equation to ensure that there is no autoregression in the estimated equation, and then proceed from general to specific search. Yet another way is the "simple to general" search recommended by Engle and Granger (1987) in which one starts with fewer lags and then goes ahead to test for added lags. This method has been followed by Bahmani-Oskooee and Alse (1993). The advantage of this last method seems to be its simplicity when too many lags may be undesirable because of the sample size. If the sample size is relatively small, too many lags may lead to overparameterization of the model and, consequently, to loss of degrees of freedom. Moreover, selecting large number of lags in the beginning may result in insignificant F-tests although fewer lags might have led to significant results. Keeping these considerations in mind, we follow the procedure recommended by Engle and Granger (1987) and used by Bahmani-Oskooee and Alse (1993) in their study.

7.5 The Empirical Results

As noted before, the standard Granger procedure is inapplicable if real exports and real GDP are cointegrated. If the variables are not cointegrated, the standard procedure can be applied. In the Indian case, however, real exports and real GDP are not cointegrated (as shown below). Therefore, we shall use the above equations minus the error-correction terms.

Heller and Porter (1978) and Sheehey (1990) have noted that there is a in-built correlation between exports and GDP as exports are a substantial component of GDP. Therefore, the econometric results depicting significant relationship between export growth and GDP growth are biased. To take note of this objection, we have used both concepts, real GDP as well as real GDP net of exports. The real GDP has been defined as real gross domestic product at factor cost from National Accounts Statistics, Government of India. In our empirical work we have used the log of this variable (LRY).

We have used four definitions of exports. LRX1 is the log of real exports with export figures in rupees (X1) being taken from Directorate General of Commercial Intelligence and Statistics (DGCI&S), Ministry of Commerce, Government of India. LRX2 is the log of real exports with X2 taken from Reserve Bank of India. In LRX3, X3 is exports of goods and services taken from National Accounts Statistics, Central Statistical Organisation, Government of India. Finally, in LRX4, X4 comes from International Financial Statistics. In the above definitions the first three real exports measures have been arrived at after deflating the rupee figures with the Wholesale Price Index (WPI); while in the last definition the unit export values have been used to deflate the nominal exports in rupees. The source of WPI is Office of the Economic Adviser, Ministry of Industry, Government of India; and the unit export values were obtained from International Financial Statistics.

Marshall and Jung (1985) used an export price index (when available) to deflate the nominal export series to convert it into real exports. For countries where there was no export price index, they use a consumer price index instead. They point out that there are difficulties with both price indices. The consumer price index fails to pick up changes in the terms of trade. The export price index is frequently not a constant basket price index but a unit value index, the composition of which varies. They find that where exports are deflated by consumer price index for every country, the results are less favourable to advocacy of an export promotion strategy. We have used WPI as well as unit export values to see whether the results are different if one index is used rather than the other. If by using both the indices the same conclusion is reached, then the results can be taken to be robust to the price index used.

As a first step, all the nine variables and their first differences were tested for stationarity using Augmented Dickey-Fuller Tests. The results are given in Table 7.1. It can be seen that in none of the level variables, the calculated ADF statistic is less than its 95% critical value. Therefore, all level variables are non-stationary at 95% level of confidence. In all the first difference variables, calculated ADF statistic is less than its 95% critical value. From this one can conclude that all the first difference

variables are stationary or I(0). Thus all level variables are I(1) since the first differences are I(0). Since all export and income variables are integrated to the order one, the next step involves carrying out cointegration analysis. That is, we have to determine the degree of integration of the residuals from the cointegrating equations. This has been done in Table 7.2.

Table: 7.1
ADF Tests For Unit Roots

variable	test statistic		95% critical value	
	levels	first differences	levels	first differences
LRX1	-1.800(0)	-5.534(0)	-3.522	-2.936
LRX2	-1.971(0)	-5.430(0)	-3.522	-2.936
LRX3	-1.732(0)	-2.994(1)	-3.525	-2.938
LRX4	-0.006(1)	-7.806(0)	-3.525	-2.938
LRY	1.684(5)	-7.385(0)	-3.522	-2.936
LRNXY1	-0.711(0)	-8.237(0)	-3.522	-2.936
LRNXY2	-0.711(0)	-8.335(0)	-3.522	-2.936
LRNXY3	-2.007(0)	-8.513(0)	-3.525	-2.938
LRNXY4	-0.727(0)	-8.479(0)	-3.522	-2.936

where
LRX1 = the log of real exports (DGCI&S)
LRX2 = the log of real exports (RBI)
LRX3 = the log of real exports (national accounts statistics)
LRX4 = the log of real exports (International Financial Statistics)
LRY = the log of real GDP at factor cost
LRNXY1 = the log of real non-export GDP after deducting X1.
LRNXY2 = the log of real non-export GDP after deducting X2.
LRNXY3 = the log of real non-export GDP after deducting X3.
LRNXY4 = the log of real non-export GDP after deducting X4.

Notes:
1. Computations were performed by using Microfit 4.0 (Pesaran and Pesaran, 1997).
2. Terms in the parenthesis show the no. of augmentations or lags (k) in ADF regressions.
3. k is chosen with the help of a model selection criterion such as Akaike Information Criterion (AIC), Schwarz Baysian Criterion (SBC) and Hannan-Quinn Criterion (HQC).
4. For all level variables, ADF test is performed using a time trend.
5. Microfit 4.0 has taken the critical values from Dickey and Fuller (1979). These values have been generated by Monte Carlo simulations.

Corresponding to the four definitions of exports, we have four definitions of non-export real income. LNXRY1 stands for the log of real non-export income and is arrived at after X1 has been deducted from nominal GDP and the net figure is then deflated by using the GDP deflator. Similarly LNRX2, LNRX3 and LNRX4 are other concepts of real non-export income corresponding to X2, X3 and X4 respectively.

From Table 7.2 it can be seen that calculated ADF statistic of all the cointegrating regressions (using different concepts of real exports and real income) is not less than the corresponding critical values. So it can be concluded that real exports and real income are not cointegrated at 95% level of confidence. However, using cointegrating Durbin-Watson statistics (which takes the value of 0.78 at 95% and 0.69 at 90% level of confidence in the vicinity of 50 observations) we can see that in the last four cointegrating equations the variables cointegrate at 90% level of confidence since the calculated CRDW is close to 0.69. Table 7.2 also reports the slope coefficients of various cointegrating regressions. Note the sign of slope coefficients which is positive in all cases. This shows that the relationship between real exports and real GDP is a positive one; an increase in exports stimulates domestic production and increase in domestic production stimulates exports.

At this juncture, it may be pointed out that the critical values used in Table 7.2 are different from those used in Table 7.1. Standard Econometrics Texts (Thomas, 1997; Gujarati, 1995) point out that it would be wrong to use Dickey-Fuller critical values of Table 7.1 (used for testing the stationarity of a variable) to test the stationarity of residuals of the cointegrating equation. The coefficients of the Dickey-Fuller regression to test for cointegration would show increased downward bias, so that the critical values have to be even more negative than in the normal case. We, therefore, use critical values from MacKinnon (1991) to test for cointegration. Microfit 4.0 (the statistical package used by us) automatically uses critical values computed from the response surface estimates given in MacKinnon (1991) for performing residual-based ADF test for cointegration.

Table: 7.2
Residual Based Tests For Cointegration

cointegrating regression	$\overline{R}^2$	slope	CRDW	ADF statistic	95% critical value
1.LRY=f(LRX1)	0.884	0.707	0.177	-2.262(0)	-3.485
2.LRX1=f(LRY)	0.884	1.254	0.193	-1.497(0)	-3.485
3.LRNXY1=f(LRX1)	0.864	0.685	0.175	-2.239(0)	-3.485
4.LRX1=f(LRNXY1)	0.864	1.267	0.190	-1.394(0)	-3.485
5.LRY=f(LRX2)	0.871	0.967	0.173	-2.239(0)	-3.485
6.LRX2=f(LRY)	0.871	1.254	0.190	-1.497(0)	-3.485
7.LRNXY2=f(LRX2)	0.850	0.674	0.171	-2.221(0)	-3.485
8.LRX2=f(LRNXY2)	0.850	1.265	0.187	-1.398(0)	-3.485
9.LRY=f(LRX3)	0.872	0.699	0.171	-2.045(0)	-3.489
10.LRX3=f(LRY)	0.872	1.253	0.188	-1.263(0)	-3.489
11.LRNXY3=f(LRX3)	0.847	0.671	0.170	-2.084(0)	-3.489
12.LRX3=f(LRNXY3)	0.847	1.267	0.186	-1.133(0)	-3.489
13.LRY=f(LRX4)	0.959	0.858	0.741	-1.597(1)	-3.489
14.LRX4=f(LRY)	0.959	1.120	0.761	-1.257(1)	-3.489
15.LRNXY4=f(LRX4)	0.950	0.841	0.657	-1.958(3)	-3.489
16.LRX4=f(LRNXY4)	0.950	1.131	0.677	-1.667(3)	-3.489

Notes:
1. Computations have been performed using Microfit 4.0 (Pesaran and Pesaran, 1997).
2. Terms in the parenthesis show the number of augmentations, k, used in ADF regressions.
3. k is chosen with the help of a model selection criterion such as AIC, SBC and HQC.
4. The critical values are different from the ones used in Table 7.1. Microfit 4.0 has taken them from MacKinnon (1991). Note that they are more negative than the ones used in Table 7.1.
5. The critical values for CRDW in the vicinity of 50 observations are 0.78 at 5% and 0.69 at 10% levels of significance respectively (Engle and Yoo, 1987).

Bahmani-Oskooee and Alse (1993), however, use the same critical values for both tests: the unit root test for testing the stationarity of a variable and the residual based test for cointegration. This procedure appears to be incorrect in the light of above discussion. If critical values taken from MacKinnon are used for cointegration tests then their results would appear less spectacular than what they have presented. If proper critical values are used, Korea becomes the second case where real exports and real GDP fail to cointegrate (Malaysia being the first). The results for other countries such as South Africa and Colombia are also diluted.

As seen earlier, our results seem to suggest a lack of cointegration between real exports and real GDP in India. If real exports and real income are not cointegrated then use of error-correction modelling is not possible. So we go back to the standard Granger procedure, which does not include the error-correction terms, for testing the direction of causality. The results are reported in Table 7.3. The last two columns of this table give the F-values with the probability values (or the exact level of significance) in brackets. It can be seen that all the F-values are significant, most of them at 1% or less. It can thus be concluded that there is a bi-directional causality between real exports growth and real income growth in all 16 equations estimated. So irrespective of the concept of real exports or real GDP used, real export growth causes real income growth and real income growth causes real export growth. Even if real income is defined net of exports to take account of the objections raised by Heller and Porter (1978) and Sheehey (1990), there is a robust evidence of dual causality between real export growth and real GDP growth. However, this evidence can be interpreted in terms of short-term causality as real exports and real income do not show any cointegration and hence a long-term relationship.

Table: 7.3
Results of Granger Causality

equation	no. of lags	F-statistics for x→y	F-statistics for y→x
1. ΔLRY=f(lagged ΔLRX1, lagged ΔLRY)	2	4.439(.018)	
2. ΔLRX1=f(lagged ΔLRX1, lagged ΔLRY)	1		9.772(.003)
3. ΔLRNXY1=f(lagged ΔLRX1, lagged ΔLRNXY1)	2	2.687(.081)	
4. ΔLRX1=f(lagged ΔLRX1, lagged ΔLRNXY1)	1		9.220(.004)
5. ΔLRY=f(lagged ΔLRX2, lagged ΔLRY)	2	5.0364(.011)	
6. ΔLRX2=f(lagged ΔLRX2, lagged ΔLRY)	1		10.225(.003)
7. ΔLRNXY2=f(lagged ΔLRX2, lagged ΔLRNXY2)	2	3.0842(.057)	
8. ΔLRX2=f(lagged ΔLRX2, lagged ΔLRNXY2)	1		9.640(.003)
9. ΔLRY=f(lagged ΔLRX3, lagged ΔLRY)	2	4.743(.014)	
10.ΔLRX3=f(lagged ΔLRX3, lagged ΔLRY)	1		8.788(.005)
11.ΔLRNXY3=f(lagged ΔLRX3, lagged ΔLRNXY3)	1	3.937(.054)	
12.ΔLRX3=f(lagged ΔLRX3, lagged ΔLRNXY3)	1		8.224(.006)
13.ΔLRY=f(lagged ΔLRX4, lagged ΔLRY)	2	11.980(.000)	
14.ΔLRX4=f(lagged ΔLRX4, lagged ΔLRY)	2		6.028(.005)
15.ΔLRNXY4=f(lagged ΔLRX4, lagged ΔLRNXY4)	1	14.161(.001)	
16.ΔLRX4=f(lagged ΔLRX4, lagged ΔLRNXY4)	1		16.974(.000)

Notes:
1.Computations were performed by using Microfit 4.0.
2. x and y stand for rates of growth of real exports and real GDP respectively.
3. Terms in the parenthesis show the probability value or the exact level of significance of the F-test.

7.6 Conclusions

The support for export-led-growth thesis based on cross-country studies lacks conviction because these studies assume (rather than prove) that export growth causes overall economic growth. These studies do not address the issue of causality between export growth and GDP growth. As we noted, this can only be done in a time-series framework. Subsequently, time-series studies tried to tackle this issue directly but evidence presented by them was rather mixed. They did not report any conclusive evidence in favour of export-led growth.

Bahmani-Oskooee and Alse (1993) pointed out that the standard causality procedures become inapplicable if the concerned variables are cointegrated. They, therefore, recommended the use of cointegration and error-correction modelling as a more comprehensive approach. This involves checking the cointegrating properties of the variables and modifying the standard Granger test to include error-correction terms in the equations. Once this is done, Bahmani-Oskooee and Alse (1993) show that there is a bi-directional causality between export growth and output growth.

Our findings suggest that real exports and real GDP are not cointegrated in the Indian case. Hence, there is no long-run relationship between them. This is hardly surprising as for the most part India followed an inward-looking trade strategy. Indian planners did not envisage the possibility of trade as an 'engine' of growth or even trade as a 'handmaiden' of growth. It is only during the 90s, and to some extent earlier during the 80s, that this inward-looking bias has been sought to be corrected. The process of opening up the economy is still continuing and in several respects still remains incomplete.

Since real exports and real GDP are not cointegrated in India, we applied the standard Granger test to test the direction of causality. Our findings suggest that there is a bi-directional causality between real export growth and real GDP growth in India. This finding is robust to the definition of exports, use of price deflator to deflate the export series and to the definition of real income (whether including exports or net of

exports). In all we ran 16 regressions (Table 7.3), eight of which showed causality from export growth to GDP growth and the remaining 8 reverse regressions showing the causality from GDP growth to export growth. Our findings are in contrast to the earlier studies by Marshall and Jung (1985) and Dodaro (1993) which fail to find any significant relationship in either direction.

Intuitively, it is not difficult to see why causality can run in both directions. Expansion of productive capacity through income growth can raise exports. At the same time increased profitability of export sector can push up the rate of saving and capital accumulation in the economy giving rise to high economic growth. Moreover, since export sector is more competitive and employs the latest techniques, it is likely to be more productive as compared to non-export sector. There may also be spillover effects from the export sector to rest of the economy. In our study this externality effect is evident from the fact that higher export growth leads to higher non-export GDP growth.

The policy implication is quite clear: export-led growth as a way forward can hardly be ignored. Real export growth has an important bearing on real GDP growth and, therefore, can be used to fuel further overall growth of the economy. This, however, does not imply that emphasis on growth should be given up. Rather, export promotion deserves as much chance as import substitution. This would require a policy regime that is neutral in the sense that it does not discriminate between domestic and export production. A neutral policy regime would encourage export expansion; at the same time it should lead to efficient import substitution. Thus we conclude by saying that even for a country of India's size an export-promotion strategy would positively promote overall growth; and overall economic growth would lead to export expansion. Both are mutually reinforcing in the Indian case.

CHAPTER 8

GOVERNMENT AS AN ENGINE OF GROWTH

As noted in Chapter 4, Indian planning was characterised by an inward-looking development strategy in which government attempted to acquire a high profile role for itself. Not only did the government intervene directly through direct investment in such areas as infrastructure, heavy industries, irrigation, defence oriented industries and technical education, it also tried to use import and industrial licensing to control private investment into desired areas as laid out in the five year plans. Through its licensing instruments the government tried to control such aspects of business activity as the plant size, location, choice of technology and import content. The public sector was given the commanding heights of the economy with areas exclusively reserved for it and with powers to enter areas of private sector and to take over any private unit in the name of consumer, shareholder or national interest. The government was also empowered to prescribe price and distribution controls to units in the private sector. The planning process came to acquire a heavy industry bias from the second plan onwards as it was thought that this would speed up the rate of growth in the long run. Deficit financing, financial repression and public control over banks were the instruments used to finance capital-intensive nature of the planning process. Not only did the government enter the so called high priority areas, overtime it came to occupy such areas as tourism, hotels, scooters, cars, bicycles, ophthalmic glass, bread, leather, wholesale and international trade.

For a backward country like India, and a latecomer to industrialisation, capital accumulation was regarded as the key to growth. This was in line with the mainstream economic thinking at that time as propounded by such luminaries as Nurkse (1953), Rosenstein-Rodan (1943) and Arthur Lewis (1954). It was held that the central issue of growth was how an economy can be transformed from one saving 4-5% of its income to that saving 12-15%. All this implied a major role for state intervention in resource mobilisation and investment. Since capital was regarded as the key to growth, considerations of efficiency were relegated to the background.

Trade-pessimism hypothesis propounded by Nurkse (1962) postulated that trade option was no longer available to the post-war developing countries (as was the case in the nineteenth century) because of the slowing down of the trade engine. These views found reinforcement from export-pessimism school represented by such economists as Prebisch (1950) and Myrdal (1957). According to this view, because of unfavourable demand conditions for primary exports, the option open before the developing countries was to follow import substitution model of growth behind high tariff walls and this typically involved greater direct and indirect role for the public sector. India's planning process, as noted before, closely reflected this line of thinking and accorded a very high profile role to the government.

The all-pervasive nature of the Indian state has been well described by Bardhan (1984). According to him the state was already overdeveloped at the time of independence (overdeveloped in relation to the economic structure). The British, in trying to rule an alien land, had amassed extraordinary powers of control and regulation. After independence, especially the first three decades of planning (starting 1951), the state seemed to have expanded to most spheres of economic activity in a manner unparalleled in Indian history. In Bardhan's words:

"There is ... no question that over the last three decades the state has accumulated powers of direct ownership and control to an extent unparalleled in Indian history, both in the spheres of circulation (banking, credit, transport, distribution and foreign trade) and production - directly manufacturing much of basic capital and capital goods, owning more than 60 per cent of all productive capital in the industrial sector, running 8 of the top ten industrial units in the country, directly employing two-thirds of all workers in the organised sector, holding through nationalised financial institutions 25 per cent of paid-up capital of joint-stock companies in the private sector (this proportion is much higher in new companies), and regulating pattern of private investment down to industrial product level and choice of technology extending to scale, location and import content" (p. 37-8).

With all pervasive nature of the government, it may be expected that government acted as an engine of growth in India. The objective of this chapter is to examine the hypothesis whether government indeed acted as an engine of growth. Ram (1986) has summarised several ways in which a large government size is likely to be a powerful engine of economic development. These include: "(i) role of the government in harmonising conflicts between private and social interests, (ii) prevention of exploitation of the country by foreigners, and (iii) securing an increase in productive investment and providing a socially optimal direction for growth and development" (p. 191).

It was often argued that market failure is quite widespread in developing countries and therefore governmental intervention is justified. Meier (1989) has summarised the various forms the market failure could take:

1. The market does not function properly - the case of market imperfections.
2. The market result is incorrect - the case of externalities.
3. No market exists for the relevant activity - the case of public goods
4. The market yields undesirable results in terms of objectives other than resource allocation.

In these cases of market failure, market prices do not exist, do not reflect the true value, or are irrelevant. In developing countries, markets may be deficient in provision of information and there may be long adjustment lags; therefore, market signalling may be subject to serious drawbacks. In developmental context, determination of the amount and composition of investment is too important to be left to individual decisions. It can, therefore, be argued that governmental intervention can lead to a better outcome.

It is plausible to argue that even government consumption can be growth promoting. Landau (1983) points out that substantial proportions of government consumption expenditure are in fact investment in the broader sense, especially education and health care. Thus a higher government consumption does not necessarily reduce capital formation even if it is at the expanse of conventional investment. Thus, when

we test the hypothesis of government as an engine of growth we can test three propositions: (1) Does total government spending (which includes both investment and consumption) act as an engine of growth? (2) Does government investment act as an engine of growth? (3) Does government consumption act as an engine of growth?

In testing the above propositions in the Indian case we shall make use of the methodology outlined in the previous chapter. First the variables will be tested for cointegration. If government spending and GDP are found to be cointegrated then Granger-causality procedure will be modified to include an error-correction term. If not, then traditional Granger-causality method (minus the error-correction term) will be used. It may be pointed out that, perhaps, this is the first study which goes into the question of causality between government expenditure and GDP growth in India.

It may be asked: why is it necessary to test government-led-growth hypothesis in India in a dissertation on the impact of trade policy on growth in India? In the previous chapter, we saw that export growth and economic growth in India are locked in a two-way relationship and thus the export-led-growth thesis is not rejected by the data. This is indeed a striking result for India, an economy which has followed an inward-looking development strategy for most of its planning history. This result will look less striking if it turns out that government-led-growth thesis is also equally true. To rule out this possibility, therefore, it becomes imperative to test this thesis.

The scheme of this chapter is as follows. First, we shall survey the existing literature on the subject. Then we shall empirically examine government-led-growth thesis using cointegration and error-correction modelling framework. Finally, we shall try to explain our findings and make some concluding observations.

8.1 Review of Earlier Studies on Government-Led-Growth Hypothesis

While it may be plausible to argue that government can act as an engine of growth, it is also equally plausible to argue that large government size may be detrimental to efficiency and economic growth because (i) government operations are often

conducted inefficiently, (ii) the regulatory process imposes excessive burdens and costs on the economic system and (iii) many of government's fiscal and monetary policies tend to distort economic incentives and lower the productivity of the system (Ram, 1986).

It can also be argued that if markets are imperfect or weak, the remedy does not lie in replacing the market with state controls but in strengthening them so that they function more smoothly. In Johnson's (1989) words: "Imperfect operation of the market in an underdeveloped country may be attributable to ignorance, in the sense of lack of familiarity with market mechanisms and of awareness of relevant information, or to the prevalence of other modes of behaviour then the rational maximisation of returns from effort...the appropriate Governmental policy would seem to be, not to assume from the market the responsibility for allocative decisions, but to disseminate the knowledge and information required to make the market work efficiently and to provide the education required to use it" (Meier, 1989; p. 518). Further, "much of development planning could usefully be devoted to the improvement and strengthening of the market system" (p. 519). All this, of course, does not imply *laissez faire* but "recognition of the market as an administrative instrument that is relatively cheap to operate and may therefore be efficient in spite of objectionable features of its operation" (p. 521).

In a similar vein Meier (1989) also writes: "Although market failure may provide a rationale for public-policy intervention, this is only a necessary - not a sufficient - condition for policy formulation. The realised inadequacies of market outcomes must be compared with the potential inadequacies of nonmarket efforts to ameliorate them: market failure must be weighed against nonmarket failure" (p. 515). In fact one of the major reasons why trade liberalisation has become so popular since the eighties is the fact of 'government failure' in a number of developing countries in which governmental intervention took the form of replacing the markets rather than strengthening them.

So the issue whether government promotes or retards growth has to be settled empirically. Unfortunately there are not many studies which have gone into empirical assessment of the issue. And those which do exist have reported contradictory results.

Landau (1983) has used government consumption as a proportion of GDP as a proxy for government size on the grounds that substantial portions of these expenditures are on health and education. He found that a negative relationship exists between the share of government consumption expenditure in GDP and the growth of per capita GDP. The negative relationship was found for the full sample of 104 countries, unweighted or weighted by population, for all six time periods examined, and excluding or including the major oil exporters.

These results seem to favour pro-market view that larger government size hurts economic growth. Landau, however, cautions that strong conclusions should not be drawn from his findings due to several reasons. Firstly, the government share variable is only government consumption expenditure, not total government expenditure or total government impact (defined to include regulation as well). Secondly, government expenditure might help increase economic welfare even if it leads to decline in the growth of per capita income.

Ram (1986) used the Feder-type model for both his cross-country and time-series studies on the impact of government expenditure on economic growth. The data for 115 countries of the sample are drawn from Summers and Heston (1984). The cross-section study uses data averaged over two time periods, 1960-70 and 1970-80, while the time-series study for individual countries uses the period 1960-80. The main findings are: (1) the overall impact of government size on growth is positive; (2) the externality effect of government size is generally positive; (3) factor productivity in the government sector appears higher as compared to non-government sector; and (4) positive effect of government size on growth is stronger in lower income countries. There is a broad harmony between the estimates obtained from time-series and cross-section data. The message in both type of studies is the same, namely, government size exercises a statistically significant positive effect on economic performance.

India was one of the countries included by Ram in his time-series study. In his econometric analysis for India, Ram finds that the autoregressive parameter was significant at 10% level and, therefore, he employed first-order autoregressive (AR1) model instead of OLS. The findings for India suggest that the externality parameter as well as inter-sectoral productivity parameter associated with the government sector are both positive and significant. The conclusion reached is that government size exercises a statistically significant positive effect on growth in India over the period 1960-80 through externality effect as well as higher productivity effect.

The above studies suffer from at least two major drawbacks. Firstly, the above studies use a regression framework and do not address the issue of causality between the government variable and economic growth. The second problem relates to in-built correlation between income and any sub-category which is a substantial portion of income (e.g., government spending). Therefore, income has to be defined net of government spending to overcome this shortcoming.

Love (1994) overcomes the above shortcomings by directly addressing the causality issue in a time-series framework and defining income net of government sector. The causality procedure used by Love is Hsiao synthesis which is an improvement on the Granger procedure in the sense that it permits identification of optimum lag length as well as eliminates ambiguity in the level of significance. Love examines government-led-growth hypothesis for 20 countries using the period 1960-90 (for most countries) for his study. His results suggest that government-led-growth hypothesis is valid for just one country, namely Kenya. The only other country with a significant result is Sierra Leone for which the causation is negative, i.e., government expansion is detrimental to growth. If the income variable is defined net of government sector, these two countries lose statistical significance, though retaining the same signs. Thus, Love concludes that there is very limited evidence consistent with government-led-growth hypothesis. His findings further suggest that causality operates in the other direction, from income growth to expansion of the government in few more cases. If income is defined net of government sector, then all the cases become insignificant.

Although Love has overcome the drawbacks of in-built correlation or lack of causality testing in earlier studies, he did not test the cointegrating properties of the concerned variables to see if there was a long-term relationship involved. In this study we shall make an attempt to study the cointegrating properties of real government spending and real GDP before we proceed to Granger-causality.

8.2 Empirical Evidence For India

In this section we shall first look into the issue of causality between the growth of real government expenditure (consumption plus investment) and GDP growth. Secondly, we shall examine the causality between growth of real government consumption and growth of real GDP. Thirdly, we shall take up the causality between growth of real government investment and real GDP growth. As a first step the cointegrating properties of the variables will be tested before proceeding to Granger causality. The time period of our study is 1950-95, a period spanning 46 years.

Methodological issues have already been discussed. We shall briefly state three points which have already been covered in the last chapter. First is the question of the number of lags to be included in the Granger-causality test. As before, we shall include as many lags as are necessary to whiten the residuals. As a strategy we shall start from fewer lags and then proceed to more lags; the idea being that if white noise residuals are achieved with fewer lags, that model would be preferred to the one with larger lags in the interest of parsimony. The second point relates to the problem of in-built correlation. To overcome this problem, Granger-causality will also be tested with an income variable which is defined to exclude government expenditure. Finally, all level variables are expressed in natural logs so that first differences can be interpreted as rates of growth.

1. Causality Between Growth of Total Government Spending and GDP Growth

Table 8.1a: ADF tests for unit roots				
variable	**Test statistic**		**95% critical value**	
	levels	first differences	levels	first differences
LRY	1.684(5)	-7.385(0)	-3.522	-2.936
LRNGY	1.853(5)	-7.449(0)	-3.525	-2.938
LRGE	-3.444(0)	-4.545(3)	-3.522	-2.936

Table 8.1b: Residual based test for cointegration				
regression	$\overline{R}^2$	**CRDW**	**ADF**	**95% CV**
LRY = f(LRGE)	0.960	0.316	-0.780	-3.489
LRGE = f(LRY)	0.960	0.321	-1.372	-3.489
LRNGY = f(LRGE)	0.936	0.342	-0.786	-3.489
LRGE = f(LRNGY)	0.936	0.343	-1.503	-3.489

Table 8.1c: Results of Granger Causality				
regression	**lags**	**sign**	**F(g→y)**	**F(y→g)**
ΔLRY=f(lagged ΔLRGE, lagged ΔLRY)	1	(-)	3.984 (.053)	
ΔLRGE=f(lagged ΔLRGE, lagged ΔLRY)	1	(+)		5.065 (.030)
ΔLRNGY=f(lagged ΔLRGE, lagged ΔLRNGY)	1	(-)	5.857 (.020)	
ΔLRGE=f(lagged ΔLRGE, lagged ΔLRNGY)	1	(+)		5.810 (.021)

where L before a variable stands for natural log
RY = real GDP at factor cost
RGE = real government expenditure
RNGY= real non-government GDP

Notes:
(1) Terms in the brackets are no of augmentations (k) in Table 8.1a and probability values in Table 8.1c.

Let us first take up the causality between growth of total government spending (ΔLRGE) and growth of real income (ΔLRY). Table 8.1a shows that all level variables are nonstationary. Since all first differences are I(0), it was concluded that all level variables were I(1). Table 8.1b shows that none of the regressions show cointegrated variables. The conclusion is that there is no long-term relationship between real government spending and real GDP. Therefore, simple Granger-causality test was performed minus the error-correction term.

The results of Granger causality are shown in Table 8.1c. It can be seen that all the four F-statistics reported in the table are significant. Growth of total government spending has a significant effect on growth of GDP but the sign is negative. This means that growth of government sector is detrimental to GDP growth. The conclusion is unchanged even if GDP is defined net of government spending to take account of the problem of in-built correlation. The reverse causality is also significant and positive in both cases. This means that growth of real GDP has a positive and significant impact on growth of real government spending. The conclusion still holds even if GDP is defined net of government spending. It may be noted that both types of causality reported above is short term in nature as we have already ruled out long-term relationship between real government spending and real GDP.

The finding that expansion of the government sector is detrimental to growth is quite striking in a country which followed an inward-looking strategy of development and where government intervention was seen to be all pervasive in nature. Is it the growth of real government consumption which is detrimental to growth? Or is it the growth (or lack of it) of real government investment which is the actual culprit? To answer these questions one has to break down the government spending into consumption and investment and then examine the causality issue at a disaggregated level.

Next, therefore, we take up the causality between growth of real government consumption (ΔLRGC) and growth of real GDP (ΔLRY). Table 8.2a shows that all level variables are I(1) since the first differences are I(0). Table 8.2b tells us that the variables in none of the cointegrating regressions show cointegration at 5% level of

significance. So there is no long-term relationship between real government consumption and real GDP even if GDP is defined net of government consumption. In the next step we carried out Granger-causality test minus the error-correction term.

Results of Granger-causality are reported in Table 8.2c. It can be seen that all the F values are insignificant. Thus growth of real government consumption has no significant impact on growth real GDP (even if GDP is defined net of government consumption). Note that sign is negative although insignificant. On the other hand, sign of the reverse causality is positive but insignificant. That is there is no significant impact of growth of real GDP on growth of government consumption (even if GDP is taken net of government consumption). Thus, there is no evidence of causality in either direction.

Finally, we take up the issue of causality between growth of real government investment (ΔLRGI) and growth of real GDP (ΔLRY). Table 8.3a shows that all level variables are I(1). Table 8.3b reports the results of ADF test for cointegration. It can be seen that variables in none of the four cointegrating regressions cointegrate at 5% level of significance. From this it was concluded that there is no long-term relationship between real government investment and real GDP. In the next step, therefore, standard Granger-causality test was performed which did not include the error-correction term.

Table 8.3c reports the results of Granger causality. It can be seen that all the four F values are significant. Growth of real government investment has a significant influence over growth of real GDP but the sign is negative. This implies that Growth of real government investment is detrimental to real GDP growth. This conclusion holds even if GDP is defined to exclude government investment. The reverse causality is also significant and the sign is positive. It means that real GDP growth has a positive impact on growth of real government investment. Once again the causality reported above is a short-term phenomenon as long-term relationship between the level variables has already been ruled out.

2. Causality Between Growth of Government Consumption and GDP Growth

Table 8.2a
ADF tests for unit roots

variable	Test statistic		95% critical value	
	levels	first differences	levels	first differences
LRY	1.684(5)	-7.385(0)	-3.522	-2.936
LRGC	-2.594(1)	-4.499(0)	-3.519	-2.934
LRNGCY	1.223(4)	-7.598(0)	-3.522	-2.936

Table 8.2b
Residual based test for cointegration

regression	R^2	CRDW	ADF	95% CV
LRY = f(LRGC)	0.974	0.292	-1.036	-3.489
LRGC = f(LRY)	0.974	0.290	-1.306	-3.489
LRNGCY = f(LRGC)	0.968	0.303	-1.039	-3.489
LRGC = f(LRNGCY)	0.968	0.300	-1.335	-3.489

Table 8.2c
Results of Granger Causality

regression	lags	sign	F(g→y)	F(y→g)
ΔLRY=f(lagged ΔLRY, lagged ΔLRGC)	1	(-)	0.001 (.972)	
ΔLRGC=f(lagged ΔLRY, lagged ΔLRGC)	1	(+)		1.014 (.320)
ΔLRNGCY=f(lagged ΔLRNGCY, lagged ΔLRGC)	1	(-)	0.280 (.600)	
ΔLRGC=f(lagged ΔLRNGCY, lagged ΔLRGC)	2	(+)		1.024 (.369)

where L = natural log
RY = real GDP at factor cost
RGC = real government consumption
RNGCY = Real GDP net of government consumption

Notes:
(1) Terms in brackets are the no of augmentations in Table 8.2a and probability values in Table 8.2c

3. Causality Between Growth of Government Investment and GDP Growth

Table 8.3a
ADF tests for unit roots

variable	Test statistic		95% critical value	
	levels	first differences	levels	first differences
LRY	1.684(5)	-7.385(0)	-3.522	-2.936
LRGI	-2.285(4)	-4.024(3)	-2.934	-2.936
LRNGIY	0.730(4)	-7.645(0)	-3.522	-2.936

Table 8.3b
Residual based test for cointegration

regression	R^2	CRDW	ADF	95% CV
LRY = f(LRGI)	0.908	0.302	-1.030	-3.489
LRGI = f(LRY)	0.908	0.324	-1.962	-3.489
LRNGIY = f(LRGI)	0.887	0.314	-1.084	-3.489
LRGI = f(LRNGIY)	0.887	0.335	-2.102	-3.489

Table 8.3c
Results of Granger Causality

regression	lags	sign	F(g→y)	F(y→g)
ΔLRY=f(lagged ΔLRY, lagged ΔLRGI)	1	(-)	6.004 (.019)	
ΔLRGI= f(lagged ΔLRY, lagged ΔLRGI)	1	(+)		5.403 (.025)
ΔLRNGIY=f(lagged ΔLRNGIY, lagged ΔLRGI)	1	(-)	6.804 (.013)	
ΔLRGI=f(lagged ΔLRNGIY, lagged ΔLRGI)	1	(+)		6.377 (.016)

where L = natural log
RY = real GDP at factor cost
RGI = real government investment
RNGIY = real GDP net of government investment

Did government act as an engine of growth in India? The first conclusion from our cointegration analysis is that there is no long-term relationship between real government spending and real income. From the above results, it is clear that growth of real government spending (as well as real government investment) is detrimental to growth in the short run. Government consumption, on the other hand, has no causal impact on growth both in the short term as well as the long term. So what we find is a case of government-led retardation rather than government-led growth. This is indeed a striking result as government intervention through investment was expected to accelerate the rate of economic growth and not to retard it. As noted earlier, the key issue in economic growth was thought to be capital accumulation and direct government intervention (through public investment with emphasis on capital goods sector) was thought to be the way to accelerate this process.

In India expansion of the government sector was detrimental to growth. Conversely, in periods when growth of government spending decelerated, rate of growth of real GDP accelerated! Evidence presented in Tables 8.4a and 8.4b suggests that while the rates of growth of real government spending and real government investment declined after 1980, rate of growth of real GDP showed an acceleration. Rate of growth of real government consumption did not show any change after 1980, indicating that acceleration in GDP growth was not accompanied by acceleration or deceleration in growth of real government consumption.

Table 8.4a:
Growth rates (%) of real gross domestic product (y), real government consumption (c), real government investment (i) and real government expenditure (e)

Year	y	c	i	e
1951	3.1	1.03	10.22	4.80
1952	2.6	0.12	-14.38	-6.27
1953	6.2	1.25	10.36	4.92
1954	5.0	0.58	41.07	17.72
1955	3.4	2.77	15.87	9.42
1956	5.5	6.97	28.67	18.63
1957	-0.2	12.61	29.74	22.59
1958	7.3	3.54	-16.66	-8.91
1959	2.7	1.80	5.95	4.14
1960	5.1	5.40	21.35	14.55
1961	3.9	7.36	-3.77	0.59
1962	3.2	20.67	22.56	21.77
1963	6.3	23.85	9.40	15.39
1964	7.4	3.59	10.70	7.54
1965	-2.4	9.72	7.63	8.53
1966	-0.3	0.86	-18.14	-9.91
1967	7.7	2.02	1.55	1.78
1968	3.6	5.49	-8.43	-1.66
1969	6.5	9.77	-2.47	3.91
1970	5.2	9.38	17.09	12.84
1971	1.8	10.33	10.74	10.52
1972	-0.6	0.35	4.31	2.20
1973	3.0	-1.03	11.03	4.71
1974	1.2	-4.62	-6.73	-5.68
1975	9.2	10.41	27.13	18.77
1976	1.8	7.93	10.09	9.09
1977	7.2	3.04	-11.29	-4.69
1978	5.8	7.41	17.55	12.51
1979	-5.2	6.13	2.65	4.30
1980	6.6	5.31	-11.38	-3.31
1981	6.5	4.43	26.75	15.00
1982	3.8	10.33	9.50	9.90
1983	7.4	4.48	-4.45	-0.16
1984	3.7	7.83	9.60	8.71
1985	5.5	11.43	8.37	9.89
1986	4.9	10.17	9.18	9.68
1987	4.8	8.69	-8.85	0.05
1988	9.9	5.33	9.71	7.30
1989	6.6	5.64	3.46	4.64
1990	5.7	3.35	4.64	3.93
1991	0.4	-0.56	-6.75	-3.39
1992	5.4	3.35	3.01	3.20
1993	4.8	6.41	4.27	5.47
1994	7.8	1.89	17.19	8.55
1995	7.2	4.85	-4.49	0.46
1996	7.5	5.11		

Source:(1) National Accounts statistics, Government of India, various years
(2) Economic survey, Government of India, various years
(3) My calculations

Table 8.4b: Average annual growth rates				
period	**y**	**c**	**i**	**e**
1951-79	3.7	5.8	8.1	6.7
1980-96*	5.8	5.8	4.4	5.0

* Average annual growth rates for real government investment and real government expenditure are for the period 1980-95.

The above findings are in contrast to Ram's finding that government spending was significant in affecting economic growth over the period 1960-80, through externality effect as well as higher productivity effect. Ram, however, did not make any attempt to examine the issue of causality between GDP growth and growth of real government spending. As already noted, he used Feder-type regression framework without going into causality analysis. Moreover, he uses a much shorter time period, 1960-80, whereas we have taken a much broader period , 1950-95. Further, Ram uses Summers and Heston data set in which variables are defined differently. For example, income is defined in terms of purchasing power parity, whereas in our case we have used data from National Accounts Statistics, Government of India, in which GDP is defined in the usual way.

Prima facie, it appears that direct government involvement through its investment programme has been highly inefficient. However, the detrimental role of the government (particularly that of government investment) needs to be interpreted with some degree of caution. Although our results seem to suggest what can be termed as 'government failure', the important role the government can play in infrastructural development, health and education cannot be denied. Because of the market imperfections or market failure, the provision of these services by the private sector may not be adequate. This suggests that governmental intervention in India, instead of being 'all pervasive', needs to be selective. Instead of spreading itself too thinly, government needs to concentrate on a few areas so that its intervention is effective.

While the saving rate jumped from an average of 10.3% of GDP in the first plan (1951-56) to 21.7% during 1976-81, the growth rate of the economy continued to hover around 3.5% per annum and did not show any commensurate increase. That resource use was inefficient is corroborated by the available evidence on efficiency indicators such as incremental capital-output ratios, total factor productivity growth in Indian manufacturing and capacity utilisation rates. Some of this evidence has already been discussed in chapter 4. We shall briefly restate it.

Ahluwalia (1985, 1991) has shown that total factor productivity growth (a measure of technical progress) in the Indian manufacturing was very poor during the period 1959-80 with Solow index declining by 0.6% per annum and Translog index by 0.4% per annum. While in many developing countries total factor productivity growth (TFPG) contributed significantly to the growth performance of those countries, in India the contribution was negative. Total factor productivity performance at a disaggregated level shows that out of the total of 20 industrial groups, 14 showed negative TFPG. These included sectors such as chemicals, petroleum products, non-metallic mineral products, basic metals, metal products, electrical and non-electrical machinery in which public sector predominates.

Incremental capital-output ratio (ICOR) also portrays the same picture. ICOR, which was 2.95% during the first plan, generally showed a rising trend and reached its peak 6.63 during 1976-81. A part of the increase in ICOR can be contributed to the Indian strategy of emphasising on capital-intensive industries. That a part of the explanation lies in inefficient resource use, cannot be denied. A disaggregated industry group wise analysis of capital-output ratios suggests that the rise was almost across the board and not confined to more capital-intensive sectors such as fertilisers, petrochemicals, and electricity generation, transmission and distribution. In fact the evidence points to the dominant impact of across the board increase in capital-output ratios as compared to change in the industrial product-mix in favour of capital-intensive sectors.

Rise in capital-output ratios appears to be prominent in industries dominated or belonging to the public sector. This may be due to low capacity utilisation rates and delays in project implementation. The available evidence on capacity utilisation shows these rates are extremely low for public sector dominated industries such as electricity generation, basic metals including steel, non-electrical machinery and transport equipment. Capacity utilisation rates may, in turn, be low due to lack of complementary investments, demand deficiencies, political and administrative mismanagement. Frequent cases of delays in project implementation results in huge cost escalation; at the same time flow of output from the project is also delayed.

After a time it was expected that public sector units would earn a surplus for self-generating growth. This expectation did not materialise. The rate of return on central public units was low and that on state enterprises was even worse. Bardhan (1984) describes the situation in the following words:

"By 1981-82, no fewer than 30 public sector units under the central government had been recording losses for the previous ten years in a row, and as many as 33 had accumulated losses that more than wiped out their entire share capital base. In 1981-82, 80 enterprises incurred a loss of more than Rs 8 billion. Thirteen chronically sick units accounted for nearly 80 per cent of the losses; one of the largest among them is the National Textile Corporation, an umbrella company for sick private sector textile mills taken over by the government. The enterprises under the state governments have usually a poorer record. The loss on public irrigation works and multi-purpose river projects for all the states taken together exceeded Rs 4.5 billion in 1981-82. The commercial losses of state electricity boards came to about Rs 6 billion in that year; another Rs 2 billion went down in losses for state road transport corporations" (p. 63).

In a similar vein, Bhagwati (1993) writes: "It is noteworthy... that public sector enterprises have as a rule produced abysmally low returns on the enormous amounts of employed capital. Thus, even during the decade of the 1980s, when the awareness of the issue was keen, the simple average rate of financial return on employed capital

was 2.5 per cent! And that too was heavily weighted by the profits of 14 petroleum enterprises which produced as much as 77 per cent of 1989-90 profits. Besides, even this meagre profitability was ephemeral, based on historical cost depreciation; corrected for replacement cost, the profits in public-sector enterprises in coal, steel, fertiliser, power, and transport were even estimated to be negative" (p. 65).

The data from Economic Survey 1998-99, Ministry of Finance, Government of India, suggest that profit after tax as a proportion of total capital employed of the central public units in 1970-71, 1980-81, 1990-91 and 1996-97 was 0%, -1%, 2.2% and 5.1% respectively. As noted above these meagre returns would turn negative if proper replacement cost is taken into account.

Public sector produces many intermediate inputs such as electricity, transportation, finance, insurance, fertilisers, steel, coal etc. This means that if the private sector is to function efficiently, the public sector has to be efficient. Thus inefficient public sector has transmitted its inefficiency throughout the economy, to the users of inputs and services produced by the public sector. Not only this, failure of public sector to contribute to government savings has implied that government has to resort to domestic and foreign borrowings to finance its current expenditures and to reduction its capital expenditures. While declining capital expenditures have contributed to the infrastructural bottlenecks (and hence to low productivity of investment in user industries), large borrowings have sown the seeds of fiscal instability in India. A large borrowing programme for the government also pushes up the rate of interest for the private sector, leading to higher costs of production.

We, therefore, conclude this chapter by noting that emphasis on public sector was placed to engineer an economic take-off in India. But because of its gross inefficiency, growth of public investment succeeded in retarding the rate of growth of real GDP in the short run. An interesting finding is that there is no long-run relationship between real GDP and real government expenditure. But before any firm conclusions are drawn regarding the findings and explanations for government being detrimental to growth, further research is required. To start with, each of the factors responsible for

government being detrimental to growth requires quantification. The opportunity cost of the resources used in the government sector needs to be estimated. Further, our findings are based on the macro data regarding government spending, government investment and government consumption. Some of the governmental expenditures like those on infrastructure, education and health may in fact be growth promoting. Further research is required to ascertain the exact role of these expenditures in a time-series framework. All this is beyond the scope of the present study. For the purpose of this study, the above arguments and explanations can be taken as indicative.

CHAPTER 9

SUMMARY AND CONCLUSIONS

In this chapter we shall start with a brief summary of theoretical and empirical literature on the subject of trade policy and growth. Then we shall talk about India's experience with trade liberalisation and the political economy issues of transition from an inward-looking economy to a more open economy. Next, we shall give a summary of the findings of this study. We shall also dwell upon the policy conclusions emerging from our study and the measures that need to be taken to make export-promotion strategy a success in India. In this context, we shall emphasise the need to solve the infrastructure bottleneck which is posing a serious challenge to its growth and exports performance. We shall then highlight the areas of future research which emerge from our study. Finally, we shall make some concluding observations.

9.1 Theory and Evidence

Economic theory tells us that trade leads to better allocation of resources. If each country specialises according to its comparative advantage, trade leads to efficiency gains for all. It leads to a level of consumption which lies on a higher community indifference curve as compared to a situation in which there is no trade. These are the static gains of trade.

In a dynamic sense, trade provides material means of growth; it is a means of assimilation of technical knowledge; it is a vehicle for international movement of capital; and it provides competition to the domestic economy leading to greater production effort. In a nutshell, trade leads to a better productivity performance. Growth accounting has not come up with a satisfactory explanation for the residual which may be often as large as 30 to 50 per cent of growth. Trade can help explain at least a part of it.

The Singer-Prebisch hypothesis of secular decline in terms of trade of primary goods exporting countries, on which the case for export pessimism and consequently of

import substitution is built, seems to be exaggerated. Even if the terms of trade of primary producers have declined, it does not warrant the conclusion that developing countries cannot diversify and expand their manufactured exports such as processed primary products or simple manufactures which do not require sophisticated technology. Nor is the decline in terms of trade such as to lead to worst-case scenario of immiserising growth. Immiserising growth is more of a theoretical possibility and in India at least there is no evidence to suggest that this happened.

Protection may be justified on infant industry grounds to enable a country's real pattern of comparative advantage to emerge. However, protection has to be applied as a part of a carefully worked out strategy. To be effective, protection has to be selective and for a short period only. In practice, many countries have taken shelter under this argument to provide indiscriminate and indefinite protection to their industries. For these countries, the infant industry protection argument has come in handy to implement their policies of import substitution. Many countries of Latin America and Asia were such examples.

Our analysis seems to suggest that it is not import substitution per se which leads to adverse effects in terms of poor growth and lower efficiency. After all, outward orientation, defined in terms of neutrality of incentives to production for home and production for exports, is consistent with efficient import substitution. The problem arises if the process of import substitution is carried too far into the second stage after the easier first-stage opportunities are exhausted. It may be noted that no country, except UK and more recently Hong Kong, has industrialised without protecting its industries.

Empirical evidence also suggests that outward-oriented economies outperformed those which were inward oriented. Outward-oriented economies achieved higher GDP growth, higher saving and investment ratios, higher export growth, better agricultural and industrial performance, lower inflation, improved income distribution and better productivity growth. Considerable evidence exists to show that higher export growth is positively correlated with higher output growth. Those studies adopting production

function framework also show that higher export growth leads to higher income growth.

Many authors (Sheehey, 1992; Pritchet, 1996) have noted that superiority of outward orientation must rest on evidence other than cross-country results. Recent time-series studies (Bahmani-Oskooee and Alse, 1995; Doraisami, 1996; Ghatak et al, 1997), investigating the issue of causality between export growth and income growth in a cointegration and error-correction modelling framework, have found overwhelming support for the export-led-growth hypothesis. On the other hand, as Love (1994) has demonstrated, support for the alternative government-led-growth hypothesis is almost non-existent.

What is the link between outward orientation and growth? Is it through better productivity or higher investment? Feder's (1983) empirical work suggests that exports have an externality effect as well as a productivity effect on the economy. Levine and Renelt (1992) argue that the effect of trade on growth is via higher investment rather than via higher productivity. Esfahani's (1991) findings suggest that exports are important because they help relax the foreign exchange constraint in a two-gap framework; and in this context the role of imported intermediate inputs becomes important in promoting exports. Our findings suggest that for India trade policy impacts on growth through higher productivity rather than through investment.

9.2 India's Trade Liberalisation and Political Economy of Reforms

The 1980s saw a revival of interest in trade liberalisation. Poor economic performance of countries pursuing inward-oriented approach on the one hand and the economic miracle of east Asian economies adopting outward-oriented approach on the other led many countries to rethink their strategies. The debt crisis of early 1980s, with its link with inward orientation in trade regime, and the collapse of communism in the USSR and eastern Europe added further momentum to the process of policy reform and trade liberalisation.

India also could not remain isolated from these world wide trends. It also learned from its mistakes. The Eighth Five Year Plan, 1992-97 (Government of India, 1992), stated: "All over the world centralised economies are disintegrating. On the other hand, economies of several regions are getting integrated under the common philosophy of growth, guided by market forces and liberal policies. The emphasis is on autonomy and efficiency induced by competition. We cannot remain untouched by these trends. We have to draw lessons from the development experience of other nations during the last four decades. Development economics was largely theoretical when India started her planning in 1951. It has now acquired a considerable empirical knowledge based on the rich applied experience of many nations, among whom there were success stories as also failures. Indian planning needs to draw some of these lessons. It also needs to be guided by its own experience, gained during the last four decades" (Vol. I, p. 2).

The process of economic overhaul started in 1991 when India was faced with a severe balance of payments crisis. This crisis had its origin in the 1980s with profligate fiscal policies which essentially involved 'living beyond one's means'. A comprehensive set of reforms was initiated involving stabilisation and structural adjustment, of which trade liberalisation was an important component. Rupee has been made convertible on the current account and except for some consumer and agricultural items, trade is virtually free from import licensing. Tariffs have been drastically reduced with the average level and dispersion of protection having both come down significantly.

As a result of the reforms undertaken, India has come a long way from the foreign exchange crisis of 1991. The foreign exchange reserves stand at all time high of $36.6 billion (on 14th July, 2000). As a result of reforms India has jumped to a higher growth path of 6-7 per cent per annum and the medium term projections of 8 per cent per annum today do not appear to be unrealistic. With an annual rate of population growth of around 2 per cent, per capita income growth of 6% per year seems within reach. And such per capita growth rates can have substantial and lasting impact on poverty reduction, even on the level of absolute poverty.

India today has one of the smoothest running reform programme. In many countries of Latin America and Africa stabilisation and structural-adjustment packages led to great economic hardships with GDP, per capita incomes and employment declining for several years continuously putting these economies to great social distress and turmoil. In India the turnaround has been achieved in a relatively short period and without much loss of output or employment. Only in one year, during 1991-92, did the growth rate of GDP dip to 0.4%, and this was the result of severe compression applied to the economy as a part of the stabilisation programme. According to Virmani (1997), "The Indian reforms arguably constitute one of the fastest and most dramatic recovery from a BOP crisis" (p. 2064). In a similar vein, Ahluwalia (1996) writes: "Unlike many economies which have experienced sharp declines in growth in the early years of structural adjustment and stabilisation, India avoided severe adverse effects on production" (p. 35).

All this suggests that the problems of transition are important and have to be managed properly if reforms are to yield the desired benefits to the economy. Trade and exchange rate reforms are partly a political process in which credibility and sustainability play an important part. In a democratic framework, credibility and sustainability depend on the political consensus especially if the government happens to be a coalition of several parties. So far it was possible to establish a broad consensus on reforms with different political parties (or coalition of parties), who came to power, carrying on with the reforms process initiated by the Congress government in 1991. However, this consensus may come under increasing attack as hard decisions involving privatisation of public units, labour reforms, implementation of an industrial exit policy which allows sick units to be closed down, and implementation of user charges on public services such as irrigation, power, transport, etc.

In the earlier stage of reforms, the government chalked out its own agenda of reforms in the form of a discussion paper prepared by the Ministry of Finance, the coordinating ministry for reforms. This ensured that the private sector knew where the government was headed so that it could make suitable adjustments for the future.

Thus policy making became a more transparent exercise as many of the budget announcements were already anticipated since they figured in the discussion paper of the government. Perhaps time has come to take stock of what has been achieved so far and chalk out another agenda for the next five years. This is vital since already there are fears that the consensus on reforms is dissipating and the process has considerably slowed down due to coalition politics. This will also reassure foreign investors that reforms are on track.

However, one major weakness of the political process is that little effort has been made to educate the people about the benefits of reforms. Nor has any attempt been made to explain to them the need to tackle hard issues such as reducing subsidy on fertilisers, power, irrigation, diesel etc., the need to close nonviable units both in private as well as public sector, or the need to privatise those public units which do not serve any strategic or national purpose. The people have not been taken into confidence, and in the elections reforms are never a major issue. Even most politicians think that reforms are being attempted as a part of some technical exercise, and that they were necessary in response to the 1991 crisis, and since the things are looking up again it is business as usual. It is this failure, to educate the people as well as the political class, which causes concern regarding the long-term sustainability of the whole process particularly when easier reforms have been accomplished and time has come to take some hard decisions. Time is, therefore, ripe to take the bull by its horn and make a bold effort to accomplish these tasks of education of the people and dissemination of information to all concerned.

Some observers (Jenkins, 1997; Bardhan, 1998) have taken the view that many reforms have been accomplished avoiding major headlines or political confrontations. A process of slow but steady creeping reform has set in and is likely to continue. Therefore, the process can be described as 'reforms by stealth'. Despite vocal groups like organised labour (who fear job losses) and business houses (who fear competition from multinationals and imports), there has not been much political backlash against reforms and no pitched battles have been fought on the issue of liberalisation. Bardhan points out that if reforms remain clandestine they may strain credibility in the medium

and long run. Moreover, this approach of reforming quietly has not borne fruit where vested interests are nationally organised.

9.3 Main Findings of This Study

In Chapter 5 we constructed an outward-orientation index for India modifying the methodology used by Dollar (1992). The index is in fact a real exchange rate distortion index and one would expect that the higher the real exchange rate distortion, the lower would be the per capita income growth. We found that this index captures the ground realities quite well in India. Periods of inflation and devaluation get reflected in the changes shown by the index in the relevant time periods. We then used this index to study its impact on growth in India using cointegration and error-correction framework. We also compared our time-series results for India with those obtained by Dollar in his cross-country study.

Our main finding is that, controlling for the effect of other factors (investment ratio and variability of real exchange rate), distortion in the real exchange rate has a negative influence over per capita income growth. This result holds both in the short run as well as in the long run. This conclusion is robust in the sense that it holds irrespective of the methodology used. All the approaches used by us, namely, Engle-Granger two-step method, Johansen's ML procedure and ARDL approach, confirm the basic conclusion that outward orientation leads to higher growth of real per capita income in India. This result is identical to that obtained by Dollar (1992) that there is a significant negative relationship between distortion in the real exchange rate and growth of per capita GDP after controlling for the effects of real exchange rate variability and investment ratio.

In our study the investment ratio is insignificant in explaining the growth of real per capita income. This is true in the short run as well as in the long run. Again this conclusion is robust to the methodology used. This finding is different from the one obtained by Dollar for the entire sample of 95 countries, that investment ratio exercises a positive and significant influence over per capita income growth.

However, for the poorest 24 countries our result exactly conforms with Dollar's finding that the impact of investment ratio on per capita income growth is insignificant.

The implication of our finding seems to be that openness influences growth via productivity rather than through investment level. Our results are similar to the ones obtained by Feder (1983) that exports (a proxy for outward orientation) exercise a positive influence on growth via productivity and externality; and to that of Alam (1991) who finds that impact of trade policy on growth is through increases in productivity rather than through increases in investment rate. We noted that at the start of the planning in India the main constraint perceived by the planners was the deficiency of material capital. But our findings suggest otherwise. Our finding is that the impact of investment on growth in India is insignificant.

In Chapter 6 we tried to examine the impact of trade policy on exports in India. Our main finding here is that long-term elasticity of the real effective exchange rate (a measure of export competitiveness) with respect to real exports is -1.8; and that of world GDP with respect to real exports is 1.4. The long-term elasticities of real exports with respect to both real effective exchange rate and world GDP are significant and sufficiently large. This signifies that demand is not a constraining factor in Indian export performance; therefore, the earlier policies based on export pessimism have no empirical foundations.

REER's influence over Indian exports, in our study, is in line with that observed by other scholars such as Rangarajan (1991), Virmani (1991) and Little and Joshi (1994). None of these studies, however, used cointegration and error-correction framework to reach their conclusions. This study perhaps for the first time uses cointegration and error-correction modelling to study the impact of REER on exports.

While domestic demand and REER have a long term as well as a short term impact on export growth, WGDP has only long term impact. Moreover, long term elasticity of exports with respect to REER index is greater than that with respect to WGDP index.

Thus factors like domestic competitiveness score over world demand in explaining export performance. This conclusion is similar to the one reached by Kravis (1970), Love (1984) and Riedel (1988).

The support for the export-led-growth thesis on the basis of cross-country results lacks conviction as these studies assume (rather than prove) that export growth causes overall economic growth. To address the issue of causality between export growth and GDP growth one has to move away from cross-section approach to a time-series framework. We tried to address this issue of causality in Chapter 7. Using data for 1950-96, our findings suggest that real exports and real GDP are not cointegrated in the Indian case. Hence there is no long-run relationship between them. This is hardly surprising as up to 1991 India followed an inward-looking strategy. Indian plans were conceived on the assumption of elasticity pessimism and did not envisage the possibility of trade as an engine of growth or even trade as a handmaiden of growth. The process of opening up the economy started in true earnest in 1991 and the process remains incomplete in several important ways. Therefore, it may take quite a while before a long-term relationship between exports and GDP emerges.

Since real exports and real GDP are not cointegrated in India, we applied the standard Granger test (without the error-correction term) to test the direction of causality. Our findings suggest that there is bi-directional causality between export growth and output growth in India. This finding is robust to the definition of exports, use of price deflator for exports and the definition of real income (whether inclusive of exports or net of exports). Our finding of bi-directional causality implies that export-led-growth thesis is not rejected by the data in the Indian case. Our findings are in contrast with the earlier studies by Marshall and Jung (1985) and Dodaro (1993) which fail to find any significant relationship in either direction. Our findings are also in contrast to some recent studies by Mallick (1996) and Marjit and Raychaudhuri (1997) which find that direction of causality runs from income growth to export growth. None of these studies, however, uses as long a time period as we have done.

Intuitively it is not difficult to see why causality can run in both directions. Growth-oriented strategies will emphasise on capacity creation in a number of areas including exports. And the truth is that it may not be possible to grow fast without giving due importance to exports. At the same time increased profitability of exports can generate larger surpluses for investment and growth. Also, since exports have to compete in the international market, export sector is likely to be more productive; it is also likely to have spillover effects in rest of the economy through better techniques and better management practices (Feder, 1983). Further, if export growth increases the growth of real income, other sectors will enjoy the benefits and stimulus of increased demand.

The result that export growth and income growth are locked in a two-way relationship and export-led-growth thesis is not rejected by data is indeed a striking result for India, a country which has followed extreme form of import-substitution for most of its planning history. We noted earlier that the government became all pervasive in India over the years with the objective of engineering an economic take-off in India. It is important to test whether the government did indeed succeed in its objective of fostering government-led growth in India. If it did, then the earlier result of export-led growth in India will lose much of its shine. If the government-led-growth thesis is proved to be false in India, export-led-growth result will be rendered even more remarkable.

In Chapter 8, therefore, we tried to formally test government-led-growth thesis for India using the same methodology as employed for export-led-growth thesis. Here the first conclusion is that there is no long-term relationship between real government spending and real income. This is true if real government spending is defined in terms of real consumption or real investment or total spending. In other words, what this means is that government spending has insignificant impact on growth in the long run; and growth has insignificant impact on government spending in the long run.

For the short term, however, our finding is that real government spending (or real government investment) is detrimental to growth in India. Government consumption

has no causal impact on growth in the short term. So what we find is government-led retardation rather than government-led growth in India. This is indeed remarkable in India where government intervention through investment was expected to accelerate economic growth rather than retard it. Conversely, in periods when government spending (or government investment) decelerated, the rate of growth of GDP accelerated. Evidence suggests that after 1980, while rate of growth increased, rate of growth of real government spending and real government investment declined. Rate of growth of real government consumption did not show any change after 1980, indicating that acceleration in growth rate of the economy was not accompanied by any change in growth of real government consumption.

Prima facie, it appears that government intervention through investment was highly inefficient and the opportunity cost of these resources was very high. Evidence on capacity-utilisation rates, incremental capital-output ratio and total factor productivity growth shows that efficiency in the use of resources was very low. Capacity utilisation was extremely low for public dominated industries such as electricity generation, basic metals including steel, non-electrical machinery and transport equipment. Public sector earned extremely low rates of return on capital employed, and if historical depreciation costs (used for calculating these returns) are corrected for replacement cost, the meagre profits of the public sector turn negative. While public sector was expected to engineer an economic take-off in India, because of its gross inefficiency it succeeded in retarding the rate of growth in the short term, and in the long run its contribution was estimated to be insignificant. However, the reasons for government being detrimental to growth require quantification and elaborate research, which was beyond the scope of this study.

9.4 Policy Implications of This Study

What are the policy conclusions emerging from our study? We saw that REER is significant in explaining real export performance in the short-term as well as in the long-term. As a policy response this calls for aggressive exchange rate policy which allows nominal exchange rate to adjust for the differential in the rates of inflation

between India and its major trading partners. The above policy can be combined with a policy of low domestic inflation, by a suitable use of monetary and fiscal policies, as higher inflation (in relation to trading partners) erodes competitiveness of exports. Put differently this means that there is no virtue in keeping REER artificially inflated so that it is out of tune with the fundamentals prevailing in the economy.

This leads us to the question of the conduct of exchange rate policy in India. In this context, the Report of the Committee on Capital Account Convertibility, Reserve Bank of India (1997), chaired by S. S. Tarapore, has given some very useful guidelines.

The committee recommended that the real effective exchange rate (REER) could be used as a policy variable for the conduct of exchange rate policy. The Reserve Bank of India (RBI) should have a monitoring exchange rate band of 5 per cent around the neutral REER. The RBI should ordinarily intervene as and when the REER is outside this band. The RBI could, however, use its judgement to intervene even within the band to obviate speculative forces and unwarranted volatility. The committee further recommended that the RBI should undertake a periodic review of the neutral REER which could be changed as warranted by fundamentals.

The committee stressed that in the conduct of exchange rate policy credibility was important and this could be enhanced by transparency. In this context following guidelines could be observed: (i) the neutral REER and the base period should be announced, (ii) the REER monitoring band should be declared, (iii) the REER should be published weekly and (iv) changes in the neutral REER should be made public.

Another major conclusion of our research is that long-run elasticities of exports with respect to REER and WGDP are quite large, which implies that earlier policies based on export pessimism had no empirical foundations. Further, our outward-orientation index had a significant long-term as well as short-term impact on real per capita income growth. All this implies that policies aimed at opening up the economy further need to be intensified. This in turn implies that policy incentives have to made more

neutral between export promotion and import substitution. In concrete terms, discrimination against exports, agriculture and labour-intensive manufacture has to be eliminated or at least substantially reduced. How this can be done we shall see shortly. But for the moment we note that the Indian economy is much more open today than at any time in the past. Trade as a proportion of GDP has increased quite significantly from 14.4 per cent in 1991-92 to about 21 per cent in 1997-98. Similarly proportion of exports and imports to GDP have also significantly risen after the reforms with import to GDP ratio rising faster. These trends need to be continued.

In Chapter 7, our major finding was that export-led-growth thesis is not rejected by the data. This implies that export-led growth as a way forward can no longer be ignored. While the Indian data supports the export-led-growth thesis, it rejects the alternative government-led-growth thesis. This means that government has to vacate those areas where its presence does not serve any strategic or national purpose; at the same time it has to invest more on health, education and infrastructure. In the coming years, infrastructure may pose as a major constraint on growth in general and export promotion in particular. So we now turn to the policies and measures required for export promotion and infrastructure development.

9.4(a) export promotion

One major area in which India has a comparative advantage is consumer goods particularly leather goods, toys, garments and textiles etc. These can emerge as major export areas for India in the future. But unfortunately all these areas have been reserved for production in small-scale sector and large industries are not allowed to enter these areas. Production for exports is highly competitive and requires world class technology as well as scales of operation. Unless these areas are opened up for large-scale investment, economies of scale cannot be exploited and technological change cannot be pushed through. While substantial industrial deregulation has taken place in India, small-scale reservation for many items (including those mentioned above) continues. With consumer goods non-tariff restrictions slated to be removed by 2001, it does not really make any sense to continue with small-scale reservations.

This sector would be able to withstand foreign competition better if it is allowed the benefit of internal liberalisation now. Moreover, textile sector would have to be subjected to internal liberalisation now so that India is in a position to reap the benefits of removal of textile quotas.

Though India needs to move away from the policy of reserving items for small-scale sector as a whole, as a first step areas such as textiles, garments, leather and toys need to be dereserved immediately as these areas are crucial from exports point of view. Sustaining export momentum in these areas requires different product mixes, larger scales of operation, substantial financial investments in new technologies, and managerial innovations, all of which are generally beyond the scope of small-scale units. The policy of small-scale reservation puts severe limits on technological dynamism and adaptability that are crucial for survival in the fiercely competitive world of export markets.

Liberalisation of the consumer goods sector should be the other focus area. High protection to this sector, both quantitative as well as tariff, implies that domestic market continues to be more lucrative as compared to export market. While all quantitative restrictions on this sector are slated to go by April, 2001, average level of protection in this sector would also need to be significantly reduced if India is to emerge as a major exporter of consumer goods. Liberalisation of this sector would also have the impact of rapid expansion of jobs as this sector is more labour intensive and, therefore, well suited to India's factor endowment.

Another area requiring urgent reform is the agriculture sector. While, reforms have not directly been implemented in agriculture, it has benefited indirectly through measures to reduce the protection to the industrial sector. Reduction in quantitative and tariff protection to the industrial sector has reduced the anti-export bias from this sector; it has also made the internal terms of trade more favourable to this sector as compared to the past. However, reforms in this sector can no longer be postponed if it is to realise its true growth and export potential.

It was mentioned earlier disprotection rates in agriculture sector were as high as 30 per cent and this was sought to be corrected by a policy of input subsidies and output support prices to the farmers. Agriculture sector also suffers from many restrictions such as the inter-state movement of crops and stock holding limits on several products. Another major problem in agriculture is the unsustainable level of subsidies. Subsidies to the agriculture sector form a major component of the non-plan budget and are putting pressure on the public finances. Subsidies not only imply large fiscal deficits, but also mean less money for infrastructure such as power, roads and water (for drinking as well as irrigation). Thus, agricultural subsidies hurt the farmers more than they benefit them; therefore they need to be phased out. Also restrictions on stock holding and movement of crops also need to be removed. Further, export restrictions on several crops also need to be given up. All these liberalisation measures have the potential of not only pushing up the rate of growth of agriculture but also unleashing its export potential. At the same time, public investment on infrastructure such as irrigation, electricity and roads needs to be substantially increased. With a well-developed infrastructure, India has tremendous scope for exporting fruits, vegetables, flowers and to some extent rice and wheat.

9.4(b) infrastructure

Infrastructural inadequacies in India pose a serious constraint to its economic growth and its export performance. One major area of concern is the falling investment in infrastructure both total and public. As a proportion of GDP, total investment spending fell from 5.4 per cent in 1991-92 to 4.6 per cent in 1997-98 and public spending also fell from 4 per cent to 3 per cent over the same period. At the same time big increases expected in private investment in infrastructure failed to materialise, rising from 1.4 per cent of GDP to a marginally higher level of 1.6 per cent over the same period. While half of government revenues are used up to pay interest on public debt, subsidies on fertilisers, diesel, irrigation, food etc. eat into a substantial proportion of the remaining revenues with the result that little money is left for infrastructure development. It appears that whatever little fiscal correction has taken place since the reforms began, infrastructure sector has borne the brunt of it. Needless

to say, infrastructure requires much more public investment than has been forthcoming so far. Resources would have to be found by reducing the unsustainable level of subsidies to more manageable levels; at the same time the burden of public debt needs to be reduced by retiring it through, for example, a massive programme of privatisation.

While there is a need to substantially step up the public outlays on infrastructure, efforts have to be made to involve the private sector in infrastructure development in a big way. For this to happen, the policy framework for infrastructure has to be set right. The first requirement is to set up a set of strong, independent and professional regulatory bodies in all infrastructure sectors having elements of natural monopoly such as highways, canals, rail lines, electric transmission and distribution lines, sewage and water supply. The legal framework has to be such as to require owners of the monopoly networks to provide non-discriminatory access to all potential users at rates fixed and announced by the regulators. The regulator would specify interconnection conditions so that new producers or distributors could add to the existing network. In India the process of setting up regulatory bodies has started and already they have come up in many areas such as electricity and telecommunications. They need to come up in ports, civil aviation, railways, irrigation and roads. In electricity, while a central electricity regulatory commission has been set up, several state governments are yet to set up state electricity regulatory commissions.

At the same time, public infrastructure service providers such as railways, telecommunications, canals etc. need to be run on commercial lines and not as departments of the government. To unleash growth impulses in the economy, these require comprehensive reorganisation and restructuring and freedom from day to day interference from the administrative ministry or political structure. While railways, telecommunications can be corporatised, canals and irrigation networks can be organised on co-operative lines.

Another problem in infrastructure development relates to making long-term finance available for this sector. Recently some steps have been taken in this direction which

might help. For example, Infrastructure Development Finance Company (IDFC) has been established as a private company with public funding to provide long term finance for infrastructure sector. Another source of long-term funds could be insurance funds. Recently, this sector has been opened up for private participation including foreign investment. A regulatory authority to regulate this sector has also been set up. To mobilise long-term finance, what is required is a vibrant debt market characterised by diverse participants and diverse instruments. Although some steps have been taken to widen and deepen the debt markets, a lot more still needs to be accomplished.

Apart from the above general problems, each infrastructure sector has its own problems which need to be sorted out. For example, in the electricity sector, there is a need to unbundle state electricity boards into power generation, transmission and distribution companies to make these operations economically viable. At the same time, there is a need to levy user charges on the electricity supplied by the electricity boards. In the ports sector, major ports are managed by trusts which need to be corporatised and ultimately privatised. Regarding airports, there is an urgent need to set up a regulatory body as well as to privatise the management of major international airports. Further, the issue of allowing foreign airlines or airport companies to invest in India's aviation sector has to be sorted out. At present foreign airlines or airport companies are not allowed to invest in airports and domestic airlines.

Problems no doubt are enormous but they are not insurmountable. The government has already been able to overcome some of them. On overcoming the remaining ones depends whether infrastructure knot will finally be untangled in India and whether India would realise its true potential for growth and exports. On solving the infrastructure tangle would depend whether India will be able to reap the fruits of policy changes in areas such as trade and industry.

9.5 Future Research

Our study throws up a few things which can be useful for future research in the area of trade policy and growth. Firstly, this is the first study which adapts Dollar's methodology to a time-series study. Using Dollar's methodology we developed a time-series index of outward orientation for India and then examined its relationship with growth. This opens up a way for other researchers to construct outward orientation indices for other developing countries for which Simmers-Heston price level data are available. The outward-orientation indices could then be used to examine the relationship with growth in those countries.

Secondly, the endogenous growth theory makes it clear that growth is policy induced (and not independent of national policies as in neo-classical theory). Our objective in this research was to use Dollar's methodology and compare our time-series results with his cross-section findings. The model used by us did not consider the role of education or the stock of knowledge in explaining growth in India. Perhaps this model could be modified to take account of more contemporary economic theories. Contemporary research regarding endogenous growth models needs to be taken into account and the growth equation needs to be re-estimated in this light. Put differently, the impact of trade policy on growth needs to be re-examined using endogenous growth theory. This is another area in which future research could take place.

Thirdly, the result that government is detrimental to growth in India needs to be interpreted with some degree of caution. It can be argued that some of governmental spending, particularly that on infrastructure, education and health, may in fact be growth promoting. Our findings are based on too aggregative an analysis to suggest which expenditures are growth promoting and which are not. Therefore, a disaggregated time-series study is in order to determine the exact role of government spending on health, education and infrastructure. This is another area in which further work can be fruitful.

Finally, the explanations advanced for government being detrimental to growth in India require further research. For example, each of the factors responsible for this outcome needs to be quantified. The opportunity cost of resources used by the government needs to be estimated. Therefore, before any firm conclusions are drawn detailed research is required.

9.6 Concluding Remarks

We conclude this dissertation by making a few brief remarks. The debate on trade policy now has gone much further than the 'import substitution vs. export promotion' framework. The debate today is not about whether to liberalise trade policy or not, but how much to liberalise, in what sequence and how to tackle the problems of transition. Poor performance of those countries, which adopted second-stage import substitution on the one hand and economic miracle of East Asian economies, which adopted outward orientation on the other, has tilted the scales in favour of trade policy reform. The debt crisis of the early 1980s (with its links with inward orientation) and the collapse of communism gave further boost to trade liberalisation. Therefore, as of today, benefits of liberal trade are taken for granted. The interesting questions now relate to the problems of transition that arise from a shift to a more liberal regime.

Secondly, trade can be regarded as one of the causes of growth. Growth is a complex phenomenon and there may be many forces at work including trade and trade policy. Too much should not be read into the role trade can play. It will be a mistake to regard trade as an autonomous engine of growth. Better way of describing the role of trade would be to say that it acted as a handmaiden of growth. And this role it still continues to play. So winners and losers will be sorted out not on the basis of favourable world demand but on the basis of internal policy actions which developing countries take to make use of the trade opportunities as and when they arise. Although our empirical results suggest that a liberal trade policy will lead to higher growth in India, reforms in other areas are also important.

In this context, what are the lessons for India? India has to get its act together which involves not only reforming the trade sector but also other areas such as infrastructure, financial sector, and labour reforms. These reforms may be necessary to reap the full benefits of trade reforms and to put India on a higher sustainable growth path. The recent South-east Asian experience suggests that the right trade orientation by itself is not enough if the financial sector is weak. Reforms in other crucial areas, therefore, cannot be neglected. At the same time, while pursuing these reforms, a stable macro-economic framework has to be maintained. To sum up, the reforms started in 1991 have to be extended to other areas.

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