Monograph Series-III

IMPORT SUBSTITUTION IN THE MANUFACTURING SECTOR

HASHEEM N. SALEEM

National Institute Of Public Finance And Policy

Monograph Series - III

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FIRST PUBLISHED 1992
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Published by
Rita Wadhwa

on behalf of
National Institute of Public Finance and Policy
18/2, Satsang Vihar Marg,
Special Institutional Area,
New Delhi - 110057.

Printed in India
at
Ashish Printers & Publication (P) Ltd.
1815, Udai Chand Marg,
Kotla Mubarakpur,
New Delhi - 110003
Phone : 618335, 4633131

Price : Rs. 150

Foreword

The National Institute of Public Finance and Policy is an autonomous non-profit organisation established for carrying out research, undertaking consultancy work and imparting training in the field of public finance and policy.

The present study by Hasheem N. Saleem is a revised version of her dissertation submitted to the Centre for Economic and Social Studies, Hyderabad. This study estimates the extent of import substitution by using a modified version of the Chenery Measure in the input-output framework.

The Mahalanobis model which stressed on import substitution industrialisation to achieve long term patterns of growth and self reliance has come under severe criticism in the recent years. The move towards a more market oriented open economy approach implied a shift in the strategy of development. It is in this context that the measure of import substitution to capture the extent of shift in trade policy becomes relevant. It is hoped that this empirical study would be of interest to a wider reaction of industry and trade.

The Governing Body of the Institute does not take any responsibility for the views expressed in this report. That responsibility belongs primarily to the author.

Raja J. Chelliah
Hony. Director

Acknowledgements

I am deeply indebted to Prof. R. Radhakrishna, Director, Centre for Economic and Social Studies, Hyderabad for the generosity with which he gave me time and guidance and for motivating me to do this work.

My sincere thanks are due to Dr. M.G.Rao for his keen interest and encouragement. I am also thankful to Dr. Arindam Das-Gupta for going through the draft. I would like to thank Mrs. Rita Wadhwa for meticulous care in editing and Promila Rajvanshi for efficient typing.

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CHAPTER 1

IMPORT SUBSTITUTION STRATEGY OF ECONOMIC DEVELOPMENT

1.1 Introduction

'Import Substitution' (IS) generally refers to a policy that eliminates the importation of the commodity and allows for the production in the domestic market. The objective of this policy is to bring about structural changes in the economy. The structural change is brought about by creating gaps in the process of eliminating imports and thus making investment possible in the non-traditional sectors (Bruton, 1970).

1.2 Historical Perspective

Import Substitution Industrialization (ISI) had its origins in the writings of List (1841), who in his theory of productive forces, outlined the 'Infant Industry Argument'[1]. He opined that to bring about industrialisation, it was essential that domestic circuits be built in the economy and this could be achieved by protecting the domestic economy from the world economy. ISI had distinct origins in the different countries where it had been adopted. In some Latin American countries ISI was externally enforced. The interruption of shipping and the decline of non-military production in Europe and the US during World War II created severe shortages of manufactured goods in Latin America. This raised the relative prices of such goods and increased the profitability of IS industries. Textiles, food products and various light consumer goods industries were the principal areas of ISI (Baer, 1972). The situation that emerged, thus undermined the traditional acceptance of divi-

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1. *Views regarding the infant industry argument have been mixed. Krueger (1981) has pointed out that infant industry protection does not demarcate, whether it should be given to a particular industry or to a group of industries. Westphal (1982) argued for selective protection and export performance. His conclusion is that 'One possible reason why the industrial sector in a country like Korea following an outward looking strategy performs so well, namely, the possibility that it selectively promoted infant industries which exhibited superior performance as a result of export activity'. Krueger & Tuncer (1982) find no justification for infant industry protection in the case of Turkey as input per unit of output did not fall in the more protected areas.*

sion of labour[2]

Export pessimism was one of the crucial factors that led to ISI in Latin American countries. Prebisch (1960) considered that the terms of trade in primary products, the chief exports of the developing countries to be declining despite the policies of developing countries[3]. His view was that left to themselves they would have responded to the price shift by industrialising.

The export pessimism of Nurkse (1959) was based on the course of natural forces. His view was that a shift from natural to synthetic materials by developed countries would have a dampening effect on the exports of the developing countries. The persistent decline in the world market prices of primary products due to technological progress had severely affected the Latin American countries. After the First World War, synthetic nitrates displaced Chilean nitrates and later synthetic fibres and synthetic rubber displaced Brazilian rubber. The price inelasticity of primary products led Nurkse to advocate 'Balanced growth'.

However, after the 1950s, ISI was resorted to by deliberate economic policies. Balance of payment crisis was another factor which forced the country to restrict its imports, thus bringing about industrialization. The political argument for adoption of this strategy was that it was essential to be economically self- reliant and independent. The economic argument was that a temporary isolation would bring about rapid development (Schmitz, 1984)

1.3 Approach and Instruments

At the beginning of the import substitution process, it is the consumer goods that are sealed off from foreign imports. The reason for choosing consumer goods sector is that the cost disadvantage is comparatively less in this sector as compared to either capital goods or intermediate goods. Moreover, consumer goods are considered inessential for development and an increase in their cost will not affect other production units as would the capital goods and intermediate goods. The demand for consumer goods is assured, due to the growing population, whereas the demand for capital goods and intermediate goods would take place only as the development process is set in motion.

2. *A decrease in the import co-efficients and an increase in the industrialization co-efficients for Latin American countries after the great depression of 1929-30, has been depicted by Celso Furtado (1976) in "Economic development of Latin America".*

3. *Empirical evidence regarding the fact, that the capacity to import was severely curtailed not so much as a result of decline in quantum of exports but due to the adverse terms of trade is pointed out in Economic Survey of Latin America (ECLA), 1949.*

The policy of import substitution is achieved through discrimination of capital goods against consumer goods by tariffs, quotas, exchange control barriers, exchange rate policies and fiscal and credit policies. Some of the instruments implemented by different countries that adopted[4] are briefly enumerated below:

In Argentina[5], import substitution of the 50s was mainly in oil, steel, chemicals and motor vehicles, special incentives were designed to encourage particular industries or regions. Credit incentives which included subsidies were given through the manipulation of the reserve requirement, which allowed the banking system to finance import substitution industries at low interest rates. In Columbia[6], multiple exchange rates were adopted, and exporters of non-traditional products were allowed to sell their foreign exchange at the floating free rate. In Pakistan[7] tariffs were relatively high on consumer items. Moreover, the duties of raw materials and capital goods were relatively low than if the total value of foreign exchange had been auctioned freely. In Korea[8] and Taiwan, multiple tariff rates existed during the 50s. Tariffs were high on finished consumer goods for which close substitutes were domestically produced, lower on products for which there were no substitutes.

1.4 Critiques of ISI Strategy

(a) Neo-Classical critique

According to neo-classical economists, in the sequential process of IS, the first stage, in which IS in consumer goods industries take place, is considered the 'easy' stage[9] (Balassa, 1982). It is the second stage where IS

4. *In the World Bank Research Publication by Balassa, B and associates (1982), a detailed account of the development strategies adopted by a number of developing countries is given.*

5. *For further details regarding the development strategy as adopted by Argentina, see Berlinski and Schydlowsky in Balassa, op.cit.*

6. *For the details regarding development strategy in Columbia see Hutcheson and Schydlowsky in Balassa op.cit.*

7. *Power and Khan (1963) have shown that Pakistan's tariff structure resulted in greater demand for importation of spare parts and raw materials, which effected the savings rate. For details regarding implicit rates of protection for 48 manufacturing industries refer to Soligo and Stern (1965).*

8. *For development strategy of Korea see Westphal and Kwang Suk Kim in Balassa op.cit.*

9. *The first stage does not entail economic costs, since unskilled and semi-skilled labour are involved, sophisticated technology is not employed and market size is not a limiting factor. Whereas in the second stage, higher technology and skill are required.*

in capital and intermediate goods are required to be replaced by domestic production that difficulties arise. So the countries that adopt IS strategy extend the first stage to the maximum extent. Felix (1964) termed this as a 'premature widening'[10] of the productive sector.

The neo-classical critique[11] was directed at the following factors, namely, that excessive regulations gave rise to bureaucratisation and corruption and this discouraged private initiative, the existence of import restrictions led to higher exchang rate thus reducing the relative gains from exporting[12] and the bias against agriculture, vis-a-vis manufactured goods undermined the IS strategy. The other factors against IS strategy were that there was excess of imports of capital goods, since there was no restriction on its imports, resulting in under- utilisation of capacity. Though consumer goods imports were restricted, the intermediate goods necessary for manufacture of consumer goods increased, resulting in increased import intensity.According to the neo-classical economists, though industry grew at a quicker pace in the initial stages of development, it was apt to get 'stuck' after its first success due to exhaustion of easy import substitution opportunities (Hirschman, 1968). They advocate free play of market forces and 'getting the factor prices right' (World Bank)[13]. They base their analysis on the modern theory of comparative advantage. (Hecksher - Ohlin - Samuelson). They advocate export oriented industrialisation based on what occured in the newly industrialised countries (NICs)[14].

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10. *An expansion into a large number of relatively small scale activities rather than concentrating on a few.*

11. *The chief neo-classical critics are Little, Scott & Scitovsky (1970), .*

12. *The empirical evidence in support of their argument is available in the World Development Report (1987) box table 5.3. It shows that the effective rates of protection has been high for countries adopting ISI. The structure of protection shows that there was bias against exports and bias against agriculture, in the case of Chile and Nigeria, whereas in the case of Korea, there is not much difference between protection rates for domestic market and export market sales, though there is a bias in favour of agriculture as compared to the manufacturing sector.*

13. *This meant reducing the price of labour, raising the price of the capital, reducing the price of domestic currency vis-a-vis foreign currency.*

14. *Ranis (a representative of the neo-classical thought) takes the East Asian NICs South Korea and Taiwan as paradigm cases, and analyses their shift from primary import substitution (PIS) to primary export substitution (PES) on the basis of a comparative advantage trade model. In the PIS phase, there was a comparative advantage of land/ resources or aid and foreign capital whereas in PES phase, the comparative advantage was on skilled labour.*

(b) Structuralists critique

Prebisch (1964) an advocate of ISI in 1950s realised its shortcomings and has succinctly described its failure as due to "the proliferation of industries of every kind in a closed market depriving the Latin American countries of the advantages of specialisation and economies of scale, and owing to the protection afforded by excessive tariff duties and restrictions, a healthy form of internal competition has failed to develop, to the detriment of efficient production"[15].

(c) Neo-Marxists critique

The neo-marxists[16] and the structuralists saw the inefficient productive structure as a result of the colonial heritage, the social class formation and the economic control measures that were adopted in the neo-colonial period.

According to them, the main reason for the failure of IS, was that it was based on the existing pattern of demand and distribution of income, foreign penetration of subsidiaries under tariff barriers led to the elimination of domestic producers (Hirschman 1968) and the industrial structure tended to be monopolistic. Adoption of inappropriate technology led to the outflow of capital via transfer pricing, ISI protected the indigenous bourgeoisie in alliance with the international capital leading to transnational integration and national disintegration (Schmitz, 1984).

Bagchi (1988) has analysed the ISI process taking into account the class relationships and the tendency of an economy with the pre-capitalist structure and unequal distribution of income, to attract importable consumer durables requiring import of technology and thus extending the "easy" phase of import substitution[17].

The policy recommendations according to them was not greater reliance on the market forces as advocated by the neo-classical writers[18] but

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15. *Towards a new Trade Policy for Development: Report by the Secretary General of UNCTAD.*

16. *The views of the dependency school analysis are in accordance with that of the neo-marxists.*

17. *Bagchi (1988) stresses on the problem of effective demand as crucial to the analysis of India's ISI strategy.*

18. *Evans and Alizadeh (1984), feel that because of the incomplete specification of the internal and external factors, the economic, social and political conditions of East Asian NICs, in the neo-classical approach, the choice of policy instruments become questionable.*

greater control of foreign enterprises[19] and scrutiny over imports and redistribution of income (Schmitz, 1984).

Despite the differences in policy conclusions by the neo-classical economists, the structuralist and the neo-marxist, there has been unanimity in the disillusionment with ISI from both ideological and analytical spectrum (Schmitz, 1984).

1.5 Indian Experience of Import Substitution Industrialization (ISI)

India adopted the strategy of ISI in the fifties. The chief objective was to build a self-reliant economy. From the Second Five Year Plan, there was a determined thrust towards substitution of basic and capital goods industries. The ISI strategy was based on the model of growth as propounded by Mahalonobis. The lopsided growth which was a legacy of the colonial period was sought to be set right by adopting ISI. Deficiencies which were pronounced in the production of capital goods and basic intermediates were to be rectified by the import of machinery and critical intermediates. This was based on the reasoning that lack of industries producing investment goods could restrain high rates of investment and growth.

The Mahalonobis model stressed the significance of 'basic industries' for growth; and long term patterns of growth were to be achieved by utilisation of the products of these industries. Designing of time paths alone was not considered sufficient, but devising measures for achieving rates of saving and consumption patterns corresponding to these time paths, was also considered as an integral part of the strategy

The State was to play an active role in building a self-reliant economy, discriminating structure of protection was evolved to acquire foreign technology and for policies towards foreign investment. Import protection was to apply to new industries to give 'breathing space'. The infant-industry argument for protection was put forth.

In the Second Plan, the planners did not expect any significant increase in export earnings in the short run; during this period, some domestic and trade policies added upto a positive discrimination against exports; but they recognised 'that it is only after industrialisation has proceeded some

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19. *For the importance of State involvement for successful Third world industrialisation, refer White, G (1984).*

way, that increased production will be reflected in larger export earning'.[20]

1.6 Studies on Estimation of Import Substitution in Indian Industry

The sources of output growth in Indian industry have been analysed by Ahmed (1968) using the Chenery framework for the first three five year plans 1950-65. The major conclusions are, IS accounted for 33 per cent of industrial output growth in the First Plan and a major share came from capital goods and intermediates. In the Second Plan, IS accounted for 13 per cent of the output growth and this was contributed by paper, newsprint, petroleum products and electrical machinery. In the Third Plan, IS was 25 per cent of output growth and capital goods accounted for a major share. For the whole period 1950-51 to 1965-66 IS accounted for 23 per cent of output growth and capital goods accounted for half of it[21].

Desai (1970) has analysed the IS pattern and performance in terms of three major groups of industry, consumer goods, intermediates and investment goods, for the period 1951-61 and 1951-63 and two sub-periods 1951-57 and 1957-63. She has used the absolute, relative and Chenery measures and an aggregate measure to determine IS. The data on production and imports were taken at market prices. So the effect of change in prices as well as internal taxes on production and imports are included while measuring IS.

The conclusions arrived at, in the study are:

1. For 1951-57, there was substantial IS in consumer goods followed by investment and intermediates group.

2. For 1957-63, IS in consumer goods group was the lowest and in investment and intermediate group it was higher.

3. For the entire decade 1951-61 or 1951-63, IS in the investment group seems to predominate.

For the First Plan period, her conclusion regarding IS is at variance with that of Ahmed.

Bokil et al (1981) have estimated the extent of IS for the period 1960-75. Their production data relates to the census sector. The import data were obtained from the monthly statistics of Foreign Trade. They have used

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20. *Government of India, Planning Commission, The Second Five Year Plan 1956-61.*

21. *Output and input data are in 1960-61 prices for 1960-61 and 1965-66 but for earlier years they are in current prices.*

comparable data to make computations for industries at the two and three digit level of classification to obtain estimates of output growth due to demand expansion and import substitution for 1960, 1965, 1970 and 1975. They have analysed the results at current prices on the basis that ratios reduce the impact of the price effect.

The conclusion was that IS is prominent in the new non- traditional industries. Even in these industries the share of import substitution in the growth of output is smaller than the share due to domestic and external demand. Demand is less prominent in the non-traditional industries. Since in many of the traditional and non-traditional industries, the import- availability ratios were nearing zero, they concluded that the import substitution as a stimulus to growth has reached a saturation point.

Industries which experienced negative import substitution in 1975 over 1970, were iron and steel (Rs. 122 crores) and petroleum refineries (Rs. 171 crores), non-electrical machinery made substantial contribution of Rs 111 crores to import substitution. Import substitution in many industries were negative. These industries were canning and preservation of fruits and vegetables, sugar factories and refineries, tobacco manufacturing, spinning, weaving and finishing of textiles, and textiles not elsewhere classified (n.e.c.) furniture and fixtures, rubber products, non- ferrous basic metal industries, metal industries, metal products except machinery and transport equipment, electrical machinery, rail road equipment, motor vehicles, aircraft, professional and scientific instruments and manufactures of industries n.e.c.. They point to the fact that Import Substitution cannot be sustained for a long time in these industries.

Ahluwalia (1985) has examined whether IS has slowed down after the mid-sixties and whether its contribution to growth has also declined. She has analysed import availability ratios and import substitution for the manufacturing sector at the two-digit level of classification for three points of time i.e. 1959-60, 1965-66 and 1979-80, based on current prices. There has been no adjustment for devaluation. Her data reveal that there has been a slow down in IS, except for electrical and non-electrical machinery industries. She has analysed import substitution for the years mentioned above on the basis of use-based and input-based classification. She has used the Chenery measure to assess the extent of IS to growth. The results indicate that contribution of IS to the growth of industrial sector declined after the mid-sixties, except in the capital goods and consumer durables. In the capital goods sector, IS was associated with deceleration in growth while for consumer durables, IS accelerated growth. She ascribes the contribution of IS to deceleration of growth due to the inefficient nature of IS.

Sastry (1988) examined import substitution in capital goods and intermediate goods over the twenty year period (1960-80). His analysis of the progress of import substitution has been based on (1) trend growth rates (2) absolute change in import availability ratios (3) relative change in import availability ratio (4) the Chenery measure, and (5) the composite measure.

He has used production data relating to the factory sector of ASI and the import data of the Planning Commission to determine the extent IS for the period 1960-80. He has made adjustments for the 1966 devaluation. Production data relate to ex-factory prices and imports are at c.i.f. prices. The analysis was based on the constant prices.

In a large number of industries, the results at constant prices are at variance with that at current prices. The contribution of import substitution to change in output is 53 per cent in the non-electrical machinery and 43 per cent in transport equipment sector over the period 1960-80. The capital goods sector have shown substantial contribution to IS during the period. Much of the IS has occurred in the sixties, though its tempo slowed down in the seventies. His main conclusion is that price changes in import and domestic output to a large extent matter in analysing IS.

There have been two studies based on the Input-Output model. They are by Nambiar and Panchamukhi. Nambiar (1977) has made use of the Planning Commission Fifth Plan input-output table to estimate inter-industry IS for 45 manufacturing sectors of the Indian economy over the period 1955-74. The sectoral output and input data for 1973-74 were taken from the table, while those for 1963-64, were computed from the Annual Survey of Industries and Monthly Statistics of Foreign Trade of India. They were adjusted to 1971-72 factor prices after deducting the indirect taxes. Similarly, the sectoral output for 1955-56 was generated by using a sector-wise production index and then adjusted to 1971-72 factor prices.

The main conclusion was that during the period 1955-64, 24 sectors comprising of consumer goods attained 50 per cent IS. While 17 sectors mainly of investment goods attained more than 50 per cent IS during 1964-74, IS process was seen to have entered into the stage of producer goods, with the result that, domestic production of these goods expanded rapidly during the 1960s and the early 1970s, relative to the consumer goods industries.

Panchamukhi (1967) designed an 8 x 8 input-output table for the year 1962 to evaluate the direct and indirect effects of IS. He has also split the technical co-efficients into domestic and imported parts and has also made a distinction between the import flow co-efficient and import stock co-efficient.

Pitre's (1979), study is directed at the micro-level. In her study, she assesses the extent of IS in the machinery and transport equipment sector for the period 1960-70. In this study, the value of production are at ex-factory prices and imports are at c.i.f. prices. Her analysis relates to the census sector. She has made use of quantity indices of imports constructed by her and the index of production of the Monthly Statistics of Production of Selected Industries in India.

She has identified industries showing IS on the basis of the fulfilment of two conditions (i) total supply (i.e. domestic production and imports) does not decrease over the years and (ii) the proportion of imports to supply, registers a fall during the same period. In cases where a decrease in the proportion of imports to supply is accompanied by a corresponding decrease in supply, it is a case of fall in demand. In cases where the proportion of import to supply increases, it is a case of increase in import dependence. In cases where the proportion of import to supply decreases, provided the supply increases, it is a case of IS.

Her conclusion is that during the period 1960 to 1970, IS has taken place in the machinery and transport equipment. When this decade is split into two five year period, the period 1960 to 1965 shows IS but 1965-70 shows import dependence. This trend is found in non-electrical and transport equipment industry. However, in the electrical industry, IS has taken place during the entire decade.

Bharat Ram's (1982) study is at the unit level. He makes use of the micro level concept of IS. IS is defined as the ratio of foreign exchange value of items deleted from the import list to the total foreign exchange value of a wholly imported product. The use of this definition is to highlight the point that IS takes place in stages and the manufacture of simpler components precedes the manufacture of complex ones. This definition applies to industries which manufacture by stages. His objectives are (i) to examine whether capital stock goes up as IS goes up, (ii) whether IS responds to a change in the foreign exchange value of the domestic currency.

His findings are that for 80 per cent of the industrial sectors, the intermediate import content is negatively correlated with the capital output ratio as well as the capital value added ratio at 90 per cent level of significance. In 47 out of 53 sectors, the import content in the post devaluation period is significantly lower than in the pre-devaluation period at 95 per cent level of significance. The three case studies that he examines are integral circuits, transistor logic integral circuits and tractors.

1.7 Studies on effects of ISI Strategy in Industry

(i) Supply side analysis:

The chief critics of India's strategy of Industrialisation -Bhagwati, Desai, Srinivasan and Ahluwalia have highlighted the supply side constraints to be the cause for low long run growth of the Indian economy. Ahluwalia (1987) has summed up its main defects as under:

(a) Indiscriminate and indefinite protection given to domestic industry from foreign competition[22].

(b) Administrative burdens in a system of physical controls.

(c) The adverse effect on enterpreneurship by providing incentives for rent seeking rather than long term corporate planning[23].

(d) Little or no incentive for technological upgradation[24].

(e) High cost inefficient industries[25].

In the view of the critics, there is a precise link between the industrial strategy and deceleration in industrial growth, which is demonstrated by increase in the capital-output ratio and reduction in the growth rates of labour

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22. *Bhagwati and Srinivasan (1975) have provided some quantitative estimates of effective rate of protection (ERP) enjoyed by Indian industries. According to them the unweighted average ERP for 61 industries stood at 197 per cent in 1963-65, for 64 industries the unweighted average in 1968 came to 139 per cent and for 30 industries in 1970 it went upto 184 per cent. They argue that such high rates of protection has made Indian goods uncompetitive in the foreign market.*

23. *Economic theorists have termed these as 'directly unproductive profit' seeking (DUP) activities. These activities direct resources from productive use into unproductive but profitable lobbying to change policies or to evade them, or to seek the revenue and rents this generates.*

24. *An UNCTAD study (1983) relating to the period upto 1980, on Indian capital goods sector found that 53 per cent of the designs introduced into the markets were more than 9 years old and only 12 per cent were less than 5 years old.*

25. *Edquist and Jackabsson (1985) study on the manufacture of hydraulic excavation, were India and Korea have obtained technology from Poclain of France, since economies of scale were not realised in India, prices were three times that of the international prices, whereas in South Korea it was just 1.5 times that of the international prices.*

and total factor productivity[26].

Based on this evidence, the official recommendations, viz., the Narasimham Committee argued for 'a structural adjustment process' and a shift from quantitative controls to indirect controls and the Abid Hussain Committee recommended export-led growth strategy to overcome the short-falls of ISI.

A fresh look at the empirical evidence provided by the critics of ISI strategy on the basis of inefficiency reveals a contrary situation[27].

(ii) Demand side analysis:

Economists who have highlighted the demand side constraints of India's industrialisation strategy are Bagchi (1988), Chakravarthy (1979), Patnaik (1987) and Ghosh (1988). In the late sixties, during the period of recession, capacity utilisation was seriously affected and some economists started to talk about the limits of ISI. Since, despite improvements in food production during 1967-71, industrial production did not respond. It was then realised that the ability of the agricultural sector to generate a surplus, though crucial to sustain growth, was not a sufficient condition in a private enterprise economy. It was at this juncture that the problem of demand deficiency was highlighted.

The terms of trade had adversely affected agriculture which has had a bearing on industry. They argue that a squeeze[28] on agriculture erodes the availability of resources for industrial development, leading to an over production of home produced industrial goods (Patnaik, 1987). So, they advocate redistribution of income (Bagchi, 1988) and not export-oriented

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26. *Ahluwalia (1985) provides empirical evidence to show declining factor productivity. For the manufacturing sector as a whole, the estimate of total factor productivity (TFP) is -0.2. TFP declines during the period 1959-60 to 1979-80 except in capital goods and consumer durables.*

27. *Nambiar (1983) has pointed out that the black market premium has been over-estimated by Bhagwati. He has re-estimated it, based on price based rates. ERP exhibit a sharp decline from 1968 to 1973. Another study by the World Bank (1982), an international comparison on the purchasing power of various national currencies in terms of the U.S dollar was estimated. They indicate that India is not an inefficient producer of manufactures.*

28. *Rural employers, faced with adverse terms of trade movement, try to maintain their profits partly by reducing the share of wages in the net value added in agriculture.*

strategy, since for a continental economy like India, the stimulus for industrialization was to come from agriculture rather than from the external sector. Industry was to grow by 'exporting' domestically to the agricultural sector rather than abroad (Kaldor, 1978).

The critics of India's strategy of ISI have highlighted, as already mentioned, the high cost inefficient economy[29] and have advocated competition. This has resulted in liberalization policies.

Ghosh (1987) traces the causes for the high domestic prices in the capital goods industries to deficient demand. Her contention is that international competition should precede liberalization since liberalization leads to import penetration in the capital goods industries, (as has happened in the 80s in India) which affects industrial development[30].

In her view import penetration instead of forcing domestic industries to become efficient, perpetuates a high cost structure in the capital goods industries. This, according to her, is because the problems of shrinking or stagnant demand are linked to the inability of the industries to take advantage of the economies of scale and low levels of capacity utilisation. This would affect output growth and productivity (Verdoorn's law).

An overview of ISI strategy of development and the experience of the Indian economy, which has adopted this strategy has been given. However, the debates have been inconclusive and so a definite view point on this strategy of development is not possible.

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29. *Studies on the capital goods sector (Chandrasekhar, 1987) (Ghosh, 1988) and on non-electrical machinery industry (BICP & WB) reveal that high domestic price could be traced to high raw material costs. In the case of capital goods, the domestic costs of raw materials and components are double or atleast one and a half times the international equivalent. In the case study on non-electrical machinery, they show that the effective rates of protection on the value-added are less than unity, indicating a higher rate of protection on inputs than on output of the industry. Some of the industries were subject to net disincentives, since domestic value added was lower than the value added at international prices. The domestic resource cost too indicate that they are efficient users of resources. Sastry (1967) in his study on Automobile industry showed that for every one rupee worth of domestically produced automobile that is put on road, income generated is 51 paise.*

30. *Ghosh examines the impact of imports of capital goods on production and capacity utilisation. Growth rate in the non-electrical machinery declined from 8.3 per cent in 1971-72 to 1975-76 to 5.9 per cent from 1976-77 to 1984-85. Some machinery producers found that liberalised imports wiped out domestic demand. Rubber machinery manufacture experienced 22 per cent decline in output in 1985-86. Production of machine tools was also hit.*

1.8 Statement of the Study

a) The research problem

Import Substitution, as a strategy for development has been adopted by the developing countries to bring about structural changes in the economy. India adopted this strategy in the 50s to achieve rapid industrialisation. In the late 70s, however, there has been disillusionment with this strategy, and an export -led growth strategy to achieve rapid development has been advocated due to the success of the newly industrialised countries.

The focus of this study is to estimate the extent of import substitution so as to examine the extent of its decline for the period 1970-85. In the existing literature on import substitution in the manufacturing sector, we notice that the effects of the oil price hike and the impact of the liberalization process on the economy have not been fully analysed. In this study, these aspects are highlighted.

b) Objectives

The objectives of this study are:

(i) to provide comparable estimates of imports and domestic production, for the four bench-mark years, 1969-70, 1974-75, 1979-80 and 1984-85;

(ii) to estimate the extent of import substitution that has taken place in India for the four bench-mark years.

(iii) to modify the existing measure so as to obtain consistency as regards estimates of import substitution at the individual and global levels, and to obtain direct and indirect requirements of imports.

(iv) to study the impact of the oil price hike in the years 1973 and 1979, on the production and imports of the economy.

(v) to examine whether the trends in import dependency have changed in the recent past and to examine its impact on the manufacturing sector.

c) Approach

The Relative and Chenery measures of import substitution have been adopted to estimate the extent of import substitution for the years 1969-70, 1974-75, 1979-80 and 1984-85. The input-output matrix of the Fifth Plan

has been used to estimate the direct and indirect requirements of imports for the years 1973-74 to 1979-80. To examine the impact of oil price hike in 1973, the year prior to the oil price hike was selected, but since no survey was conducted for 1972, the data of 1969-70 has been used. The year 1974-75 was selected to examine the effect after the oil price hike. The year 1979-80 was chosen, as it was the year when the second oil price hike took place. To examine whether trends in imports have changed, 1984-85 was chosen as it was the year for which the latest data on production was available and the liberalization process was well underway.

d) Data base

This study is based on secondary sources and deals with the factory sector as covered by the Annual Survey of Industries (ASI). For the data on the value of production of the Indian manufacturing sector, the Annual Survey of Industries, which provides the summary results for the factory sector have been obtained at three-digit level. For data on imports, the Monthly Statistics of Foreign Trade of India (MSFTI) have been used. To estimate the direct and indirect requirement of imports for the years 1973-74 to 1979-80, the data from the Fifth and Sixth Plan technical documents have been made use of.

As the data regarding the Indian manufacturing sector as covered by ASI and trade data as covered by MSFTI follow different classification[31], a correspondence between the two at the three digit level was established (See Appendix-II). From this, the correspondence at the two digit level was made. Imports have been reclassified according to the categories of the ASI manufacturing sector which covers the group 20 - 38. For the year 1969-70, the industrial classification is that of Standard Industrial Classification (SIC), which is similar to the International Standard Industrial Classification (ISIC). For the year 1974-75, 1979-80 and 1984-85, the national industrial classification (NIC) has been used to classify the industries. The data on the value of production of the ASI factory sector has been used.

Trade Statistics (Imports) for the year 1969-70 and 1974-75 have been classified according to the Revised Indian Trade Classification (RITC). This classification has been in vogue since 1965. From April, 1977, this classification was revised and a new classification called 'Indian Trade Classification Revision-2' (ITC-Rev.2) came into existence. This classification

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31. *The basis of the Industrial classification is on the economic activity adopted, the raw materials used and the finished products whereas the trade-classification is based on the end-use, to which it is applied.*

was evolved on the basis of the Standard Industrial Trade Classification Revision-2 (SITC-Rev-2). So for the year 1979-80 and 1984- 85, trade data on imports classified according to ITC Rev-2 has been made comparable with 1969-70 data (See Appendix-II). Data regarding imports have been collected from the March issues of the MSFTI. Data regarding the value of production are in terms of ex-factory prices net of taxes and margins. Value of imports are c.i.f. net of taxes. Both the production data and import data refer to the financial year.

To obtain the extent of direct and indirect requirements of imports for the year 1973-74 and 1979-80, the data from the technical note on the Fifth and the Sixth Plan have been used. Since our main objective is to estimate the extent of import substitution in the manufacturing sector, a correspondence between the ASI classification at the two digit level was made with the Fifth and the Sixth Plan sectors. The rest, namely agriculture and service sector, were clubbed together as one sector (Refer Table 3.5).

e) Plan of the Study

This study is divided into four chapters. The first chapter is introductory in nature and examines import substitution as a strategy for development and the Indian experience in adopting this strategy. In the second chapter, various measures of import substitution are dealt with and modification of the existing measures to estimate direct and indirect imports has been detailed out. In the third chapter, imports and domestic production trends in the manufacturing sector are examined. The fourth chapter contains the estimates of import substitution for the period 1969-70 to 1984-85.

CHAPTER 2

CONCEPTUAL FRAMEWORK AND MEASURES OF IMPORT SUBSTITUTION

2.1 Definition

The phrase 'Import Substitution' has been subject to alternative meanings. One such is the definition adopted by neo- classical writers. They define IS strategy as the adoption of an effective exchange rate for the country's exports (EER_x) which is less than that for imports (EER_m). EER_x would include not just the rupees earned at parity from a unit dollar's worth of export, but also the export subsidy, tax credits and special credits and subsidies on inputs. (Similar to the concept of effective rate of assistance). Similarly EER_m would add to the parity any import duty, import premium resulting from quantitative restrictions and other incentives. If an import tariff is charged then the price of importables is raised relative to exportables. This results in a shift to domestically produced goods, exporting is discouraged by both the increased cost of imported inputs and the increased cost of domestic inputs due to domestic inflation or appreciation of the exchange rate, relative to the prices received by exporters. An overvalued exchange rate constitutes "bias against exports" (refer Appendix-I), concept that has been described in Bhagwati (1988) Little, Scott and Scitovsky (1970) and Balassa (1971).

Chenery (1960) defines IS in a different manner. He defines import substitution with reference to the proportion of imports in total supply. If domestic production rises faster than imports, import substitution is taking place and if imports rise more rapidly than, perhaps domestic output, then import liberalization is occuring. Chenery apportions the growth in domestic output (i) to growth in demand (on the assumption that a constant proportion of total supply is imported) and (ii) to the change in the ratio of imports to total supply, which he calls Import Substitution. Chenery (1987) has used identities to decompose observed growth of output in an industry into components attributed to export promotion, import substitution and intermediate use. The decomposition is a statistical description and does not relate to the incentive based definition of the trade strategy described earlier.

He views economic growth as one aspect of transformation of the

structure of production that is required to meet the changing demands. He has used both the supply and demand conditions to determine the changes in industry. He has used the Walrasian model with modifications by including international trade and intermediate goods to analyse the growth pattern.

The sources of growth on the supply side are based on the basic neo-classical growth equation, $G_v = G_a + b_k G_k + b_l G_l$, where G_v, G_a, G_k and G_l are growth rates of aggregate output (value added), total factor productivity, capital and labour respectively. b_k and b_l are elasticities of output with respect to capital and labour input. G_a is measured as the elasticity of output with respect to time.

He then uses the corresponding break-down on the demand. The result of this is that there is now a demand side view, of factors, leading to the structural change and growth that is consistent with supply side analysis.

The corresponding system of growth accounting from the demand side is made as follows.

$X_i = D_i + (E_i — M_i) + \sum_j X_{ij}$

X_i = gross output of sector i,

D_i = Domestic final demand (consumption plus investment)

$E_i — M_i$ = Net trade (Exports-Imports)

X_{ij} = $a_{ij} X_j$ = intermediate use of commodity i by sector j. (aij is assumed to vary with the level of per capita income).

Using the properties of the input-output system, he eliminates, intermediate demand as a separate source of growth by attributing it to the elements of final demand. In this way, the increase in production of sector 'i' is equated to the sum of following factors:- the expansion of domestic demand which includes the direct demand for commodity 'i' plus the indirect effects in sector 'i' of the expansion of domestic demand in other sectors, export expansion or the total effect on output from sector 'i' of increasing exports; import substitution or the total effect on output of demand in each sector that is supplied from domestic production; and technological change or the total effect on sector 'i' of changing input-output co-efficients throughout the economy as wages and income-levels rise.

2.2 Measures of Import Substitution

According to Desai (1969) there are basically two alternative types of measures of import substitution: (i) those involving some notion of optimality (ii) those which are purely descriptive, noting changes in the actual pattern of imports and domestic production, regardless of any reference to whether the actual situation is optimal or not.[1]

In this section, the measures are based on the actual pattern of imports and production. We shall, however, treat them as separate measures if there are major modifications and as variants, if there are minor modifications in the existing measure.

(a) Measures of import substitution applicable at the micro level

Measure - 1: A crude measure of import substitution is to examine the growth rates of imports and domestic production. If domestic production increases at a faster rate than imports, then import substitution is taking place. Sastry (1988) has used the semi-log trend growth rates to estimate import substitution for different periods using time series data. The major limitation of this measure is that it is affected by the initial values. Imports may show high growth rates because of low initial values and production may show low growth rates because of high initial values.

Measure - 2: Another measure that has been used by Desai (1970), Bokil et al (1981) and Sastry (1988) to determine import substitution is the import availability ratio. This measure computes the difference between the ratios of import availability during different periods of time and if the change is positive, then there is import substitution taking place. Thus if M^1 and M^o are the imports during the current and base year and if S^1 and S^o are the total availability and X^1 and X^o are domestic output, $S^1 = M^1+X^1$ then if

$$\frac{M^o}{S^o} - \frac{M^1}{S^1} > 0,$$

there is import substitution to the extent of the change in the value of the ratio. This is an absolute measure.

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1. *She has distinguished these two types of measures through the standard two-commodity trade theoretic diagram, illustrating general equilibrium for an open economy. For further details see "Alternative measures of import substitution" by Padma Desai, Oxford Economic Papers, July, 1969.*

Variant of Measure -2: This measure has been used by Desai and Sastry; termed as the relative measure, it expresses the magnitude of import substitution yielded by Measure-2 as a proportion i.e., if

$$\frac{\frac{M^o}{S^o} - \frac{M^1}{S^1}}{\frac{M^o}{S^o}} > O,$$

there is import substitution to the extent of the relative change in the ratio. Bokil et al, also use

$$\frac{\frac{X^1}{S^1} - \frac{X^o}{S^o}}{\frac{X^o}{S^o}}$$ as the relative measure.

Measure - 3: The most widely used measure is that of Chenery. This measure[2] has been adopted by Desai (1969), Lewis and Soligo (1965), Bokil et al (1981) and Sastry (1988). According to this measure, import substitution is defined as 'the difference between growth in output with no change in the import ratio and the actual growth'. Chenery apportions the growth in domestic output (a) to growth in demand, on the assumption that a constant proportion of total supply is imported and (b) to the change in the ratio of imports to the total

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2. *This measure could be considered as a variant of Measure-2. The Chenery measure divided by ΔX could be written as*

1/ $\Delta X \{X^1 - (S^1/S^o)X^o\}$ — *(a)*

2a, Variant of Measure - 2 is equal to

$$\frac{\frac{M^o}{S^o} - \frac{M^1}{S^1}}{\frac{M^o}{S^o}}$$ *which is equal to* $$\frac{1}{M^o} \cdot \frac{S^0}{S^1} \{X^1 X^o(S^1/S^o)\}$$ *—(b)*

Import substitution occurs if $X^1 < Xo(S^1/S^o)$. Negative (b) implies a positive (a). Direction under both measures will be identical, but the magnitudes will not be so. Since in equation (a), $\{X^1 — (S^1/S^o)X^o\}$ is weighted by $1/\Delta X$ whereas in equation (b) its weight is $\frac{1}{M^o} \cdot \frac{So}{S^1}$

supply, which he calls import substitution.

Beginning from the basic identity, we get

$$S = X + M \quad \text{..... (1)}$$

Where,

S	=	Availability
X	=	Domestic production
M	=	D + E + W
D	=	Domestic demand (including inventory accumulation)
E	=	Export demand
W	=	Intermediate demand

Giving incremental values, we get

$$\Delta X + \Delta M = \Delta D + \Delta E + \Delta W \quad \text{..... (2)}$$

$$\Delta S = S^1 - S^\circ \quad \text{..... (3)}$$

$$\text{Let } U^\circ = \frac{X^\circ}{S^\circ} \text{ and } U^1 = \frac{X^1}{S^1} \quad \text{.....} \quad \text{..... (4)}$$

$$\text{Then } \Delta X = S^1U^1 - S^\circ U^\circ \quad \text{..... (5)}$$

Substituting S° by $S^1 - \Delta S$, (refer equation (3)) in equation (5) we get

$$\Delta X = S^1U^1 - (S^1 - \Delta S)U^\circ \quad \text{.... (6)}$$
$$\Delta X = S^1(U^1-U^\circ)+U^\circ \Delta S \quad \text{..... (7)}$$

The change in domestic output ascribed to import substitution is measured by the change in the proportion of total supply imported, when total demand is held constant. $(U^1-U^\circ)\ S^1$ is taken as the measure of import substitution, $U^\circ\Delta S$ is the change in output caused by change in demand. According to Chenery, the change in output could be either ascribed to changes in demand (i.e. final demand, intermediate demand or export demand) or due to import substitution

$$\Delta X = U^\circ (\Delta D + \Delta W)+U^\circ\Delta E+(U^1-U^\circ)S^1$$

$(U^1-U^\circ)S^1$, as has been already pointed out, is the measure of import substitution but this term includes the interaction element (1965). This has been pointed out by Eysenbach (1969) to Lewis and Soligo, who have used

the measure to study growth and structural change in Pakistan's manufacturing sector.

He pointed out that

$$(U^1-U^o)S^1 = (U^1-U^o)(S^o + \Delta S)$$
$$= \Delta U(D^o + W^o + E^o) + U(\Delta D + \Delta W + \Delta E)$$

It is only the first term i.e. $\Delta U (D^o + W^o + E^o)$, that is to be attributed to import substitution. The second term is the interaction term, the product of two finite changes, which results from the co-existence of both import substitution and demand growth. So, the use of $(U^1-U^o)S^1$ to measure import substitution could result in over estimation.

Variant of Measure-3 : Bokil et al (1981), look upon import substitution as the change in import availability ratios over time, multiplied by the total supply at the end of the year.

$$\Delta M = \left(\frac{M^1}{S^1} - \frac{M^o}{S^o}\right) S^1 + (S^1 - S^o)\frac{M^o}{S^o}$$

The difference, in this variant of Measure-3, is with regard to the residual term-2. In Measure-3, the residual effect is the estimate of domestic demand that would prevail under constant production-availability ratio and in 3a, the variant, the residual is the estimate of import demand under constant import availability ratio.

Variant of Measure-3 : A modification of the Chenery measure has been made by Gupta (1987) to incorporate changes in the supply at the end period, this is to take into account the temporary dislocations that may occur in the domestic or international market. In this version $(U^1 - U^o)$ is weighted by S^o instead of S^1 as followed by Chenery.

$$\frac{(U^1 - U^o)S^o}{\Delta X} + \frac{U^1 (S^1 - S^o)}{\Delta X}$$

The term $(U^1 - U^o)S^o$, gives the change in output due to import substitution. The expression $U^1 (S^1 - S^o)$ is the output due to change in the supply situation and could be termed as the size effect (Sastry, 1988).

Variant of Measure-3 : Sastry (1988) has used a composite measure, which takes into account the initial and the terminal year supply. The composite measure is given as

$$\frac{(U^1 - U^o)S^o / \Delta X + (U^1 - U^o)S^1 / \Delta X}{2}$$

In Measure -3 and its variants, (except in Variant 3a), a positive magnitude indicates import substitution and a negative magnitude indicates import dependence. If the change in production is zero, then import substitution does not exist.

Chenery, Shishido and Watanabe (CSW), (1962) were the first to introduce the intermediates to determine import substitution but they did not adhere to the original definition of import substitution as a decline in the ratio of imports to total supply of its products and hence the CSW method has not been followed in subsequent studies.

Measure - 4: Morley and Smith (1970) have incorporated the implicit or indirect imports to study import substitution. According to Morley and Smith, an import ultimately substitutes or supplements the output of many domestic sectors. So, if an import is to be replaced without induced rises in imported inputs or reductions in the supplies available for final demand in other sectors, production must increase not only in the industry finally processing the good but also in its supplier industries. The inclusion of the implicit imports according to them would give an accurate assessment of the total supply of each sector's products. This would enable the two components of total supply i.e. imports and domestic production to be measured on the same basis. Morley and Smith incorporate implicit or indirect imports in an input- output table.

A = input—output table
a_{ij} = Technical co-efficients

Assumptions:

(i) If import substitution of any product occurs, the technology employed is accurately described by a_{ij}.

(ii) Import substitution is viewed as domestic production necessary to substitute completely for imports, holding all final demand constant.

Then

$$(1\text{-}A)\quad X + m = f \qquad \text{..... (1)}$$

X = gross production

m = imports

f = final demand both domestic and foreign

Multiplying both sides by $(1\text{-}A)^{-1}$, we get

$$X + (1 - A)^{-1}m = (1 - A)^{-1}f \qquad \text{..... (2)}$$

$$m^* = (1 - A)^{-1}m \qquad \text{..... (3)}$$

(The vector of new defined imports)

$$S^* = X + m^* \qquad \text{..... (4)}$$

(The new vector of total supply)

$$IS^*_i = \left[\frac{m^0_i}{S^0_i} - \frac{m_i^{t*}}{S_i^{t*}}\right] S_i^{t*} \qquad \text{..... (5)}$$

m^* is the domestic production necessary to substitute completely for imports, holding all final demand constant.

The difference between Chenery and Morley and Smith's measures are as follows :

Let IS = Chenery's measure of import substitution and

Let IS* = Morley and Smith's measure of import substitution

$$\frac{m_i^{o}}{S_i^{0}} - \frac{m_i^{t}}{S_i^{t}} = \frac{X_i^{t}}{S_i^{t}} - \frac{X_i^{0}}{S_i^{0}} \qquad \text{..... (6)}$$

m_i^0 and m_i^t = Imports at the base and current period respectively

X_i^0 and X_i^t = Production at the base and current period respectively.

S_i^0 and S_i^t = Supply at the base and current period respectively.

$IS_i - IS_i^* > O$, if and only if S_i, the direct supply grows more rapidly than

($m_i^* - m_i$) the indirect supply embodied in imports. The greater the difference in these growth rates, the greater the bias implied by the Chenery approach. Limitations of Morley and Smith's measures is that they do not incorporate changes in the final demand of one sector which ultimately affects all other sectors. The effect of structural changes in final demand are not incorporated. Moreover, there is no a priori theoretical interpretation of declines in the import shares. A significant statistical problem arises when the import substitution measure is calculated at the aggregate level.

(b) Measures of import substitution applicable at the macro level

A major statistical problem arises when the micro level measures are applied to the macro level. Application of microlevel measures to macro level yields inconsistent results. Two possibilities are there to estimate import substitution at the global level. In a group consisting of several industries, one could either compute import substitution by taking into account aggregated imports, domestic production and supply or obtain import substitution for each industry and then aggregate for the whole group.

Symbolically, these two methods could be expressed as follows:

Macro measure 1(a)

$$\frac{\sum_{i=1}^{n} X_i^1 / \sum_{i=1}^{n} S_i^1 \; - \; \sum_{i=1}^{n} X_i^i / \sum_{i=1}^{n} S_i^i}{\sum_{i=1}^{n} \Delta X_i} \qquad \sum_{i=1}^{n} S_i^1$$

Macro measure 1(b)

$$\sum_{i=1}^{n} \frac{[\{(X_i^1/S_i^1) - (X_i^0/S_i^0)\} S_i^1]}{\sum_{i=1}^{n} \Delta X_i}$$

Desai (1970) has employed both these measures[3] to estimate substitution in the Indian economy for consumption, intermediate and investment

group of industries. Whereas Lewis and Soligo (1965) have used only the macro measure 1b to estimate the extent of import substitution in their study of structural change in Pakistan. The results from these two measures could differ, and the ranking of different groups could be reversed by employing any of the two measures.

Macro measure -2: Fane tried to reconcile results which could be obtained using aggregated and disaggregated data. He uses the Chenery measure of IS to demonstrate this. Import substitution is to be measured in two parts: IS within the industry denoted by Ii and the extra contribution, Ii* of growth in industry 'i' to IS in all other industries.

$$I_iT = I_i + I_i^* \quad \ldots\ldots (1)$$

Using formulae appropriate for small changes, he defines dIi and dIi* by

$$dI_i = S_i dU_i \quad \ldots\ldots (2)$$

$$dI_i^* = (U_i - U)dS_i \quad \ldots\ldots (3)$$

$$X = \Sigma X_i$$
$$S = \Sigma S$$
$$u = X/S$$

I_i and I_i^* are obtained from dI_i and dI_i^* by integration. The rationale for the definition of dS_i^* is that growth in an industry with a higher than average ratio of domestic production to total supply leads to an increase in this ratio for the entire group.

The contribution of import substitution to the growth of all industries is

$$dI = SdU$$

and $dI = \Sigma dI_iT$

Since $\Sigma dI_iT = \Sigma S_i dU_i + \Sigma(U_i - U)dS_i$

$$= \Sigma(S_i dU_i + U_i dS_i) - U\Sigma dS_i$$
$$= \Sigma dX_i - \Sigma U\, dS_i$$
$$= dX - UdS$$
$$= SdU$$

Even for two or more levels of aggregation based on the three equations, it yields consistent measures of import substitution.

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3. *In the Indian case where Desai has studied IS in the manufacturing sector, there was no coherence between the sectoral and global results.*

These formulae for measuring import substitution are consistent in the sense that:

(a) Import substitution for the aggregate of all industries is equal to the sum of the total contributions to import substitution in each individual industry;

$$dI = SdU = \sum_j \sum_i dI_{ij}^T$$

(b) The total contribution by group j to import substitution for all industries (dI_j^T) is the same as the value that would have been obtained by treating group j as a single industry and using equations (1), (2) & (3). The measure proposed by Fane is defined for small changes, the corresponding measure for finite changes is to be obtained by integration.

Macro measure-3: Guillaumont (1979) has defined a sectoral measure that is globally consistent. He differentiates two elements often amalgamated at the global level i.e. the substitution of local production for imports of each demanded good and the substitution between demands with different import contents. He defines import substitution in relative value as the variation of import co-efficients and in absolute value as the decrease of imports resulting from a lower co-efficient. At the global level, import substitution in the relative value is the difference between the value of the average import co-efficient which would have prevailed if import co-efficient of the products remain unchanged and the total actual value of the import co-efficient. In the absolute value the difference between the value of imports which would have prevailed if the import co-efficient by product had been unchanged and the actual value of imports. This is done so as to differentiate what is due to import substitution and what is due to the structure of demand in the variation of average import co-efficients or of the global value of imports.

In this analysis, the import content of final demand of each sector is weighted by the relative shares of final demand. A is the square matrix of technical co-efficients and M is the diagonal matrix, in which the elements are $mi = Mi/X_i$ starting from the balancing equation,

$$X + M = F + AX$$
$$(1 - A)X + M = F$$
$$(1 - A + M)X = F$$
$$X = (1 - A + M)^{-1} F$$

Let d_{ij} be the elements of the inverse matrix $(1-A+M)^{-1}$, we have $Xi = \sum_{j=i} d_{ij} F_i$

and the import content co-efficients are

$$m_i'' = \sum_{j=1} d_{ij} . M_j \quad \text{where} \quad m_i'' = \frac{M_i''}{X_i}$$

The actual import substitution, measured in relative value, for a given p is then

$$r_i'' = m_i''$$

For the economy as a whole it is:

$$r'' = -\Sigma \Delta m_i'' \alpha'' = r_i'' \alpha_i''$$

With a weighting co-efficient $\alpha_i'' = F_i/S$, which is the relative share of the final demand of the product 'i' in the total final demand or net global supply, $\Sigma\alpha_i = 1$. In absolute value, import substitution is equal to

$$R'' = r''S' = \Sigma r_i'' F_i$$

The variation in the average import co-efficient as per this formulation can be decomposed into two components namely (1) change in the structure of demand and (2) import substitution.

$$\Delta M = \sum_{i} (m_i^{\circ} \alpha_i) - r$$

Variation of the average import co-efficient	Change in the structure of demand	Import substitution

(m_i° is the import co-efficient of the ith sector in the base period).

The main difficulty with this measure is that the changes in the import/total final demand ratio of a given sector affect only that sector whereas in reality it affects all the other sectors.

Variant of macro measure -3 : Pitre and Argade (1988), have tried to solve the problem in the composition of final demand, by isolating the total import substitution in two parts, namely (1) import substitution with the same final demand composition (2) import substitution due to changes in final demand composition. The former gives the real magnitude of import substitution.

Their evaluation involves the distribution of the total final demand of the second period over the sectors with the base year composition. The imports of the second period are subtracted from the total final demand to arrive at the estimates of domestic final demands. The sectoral production values are based on the technical co-efficient matrix (A). Thus they generate a new set of sectoral output with the unchanged final demand composition. The import substitution estimates are then calculated on these new supply and output values. This modified measure is free of structure effect.

Despite the serious limitations in the measurement of import substitution, an attempt has been made to estimate the extent of import substitution with the help of the Indian data for the period 1970-85. In the next section, we briefly enumerate the method to be adopted to determine the extent of import substitution, keeping in view the obvious problems posed conceptually.

2.3 Measures of Import Substitution for the Indian Economy

We propose to estimate the extent of import substitution in the manufacturing sector for the period 1969-70 to 1984-85. The absolute, relative and the Chenery measures of import substitution would be adopted to determine the extent of import substitution for the years 1969-70, 1974-75, 1979-80 and 1984-85.

A variant of the Measure-3, incorporating change in the structure of final demand would be used to estimate the extent of import substitution for the years 1973-74 and 1979-80. The change in imports (a) due to change in import substitution, (b) due to growth in final demand and (c) due to the change in composition of final demand would be estimated.

The measure to be adopted would be as follows:

$X_i d$ = Domestic production of the ith item

M_i = Import of the ith item

S_i = Supply = $X_i + M_i$

A = Technical coefficient matrix

m_i = Proportion of imports i.e. M_i/S_i

F = Final demand

The balance equation for the ith sector would be

$$X_i^d + M_i = X_i \qquad \text{..... (1)}$$
$$X_i^d + M_i = AX_i^d + F \qquad \text{..... (2)}$$

and if we assume a constant import coefficient, m, then

$$M_i = m_i X_i \qquad \text{..... (3)}$$

So that, using (3) we get

$$M_i = m_i(X_i^d + M_i) \qquad \text{..... (4)}$$

or $M_i - M_i m_i = m_i X_i^d,$

or $M_i(1-m_i) = m_i X_i^d,$

or finally

$$M_i = \frac{m_i}{1-m_i} X_i^d \qquad \text{..... (5)}$$

Let us define $\hat{M}$ as a diagonal matrix, with ith element in the diagonal equal to (mi/1-mi), then

$$\hat{M} = MS^d$$

restating it as follows,

$$X^d + \hat{M}X^d = AX^D + F$$

or $$X^D = (1-A+\hat{M})^{-1}F \qquad \text{..... (6)}$$

Equation (6) would give us the value of total domestic output required to meet the final demand F (in value terms). The import requirement of this output would be equal to $i M X^d$ where i is a unit row vector. Import requirement per unit of final demand would be in MX^d/F.

In measuring IS between two points of time, we concentrate on the base of an unchanged technology matrix, given the data restriction. Exten-

sion to the case of different technology matrices is straightfoward. In our estimates of IS, we consider only the changes in import coefficients and the final demand. If the import requirements are obtained by taking into account the changes in the import coefficients between the terminal year and base year, holding the final demand constant, then this part of change in imports could be attributed to IS. If the import requirements are obtained by taking into account the changes in the final demand between the terminal year and base year holding the import coefficients constant, then this could be attributed to changes in final demand. For the aggregate measure the change in imports, attributed to final demand, is split into two parts that due (i) to growth in final demand, and (ii) to the composition of final demand. This could be symbolically expressed as follows:

$$\text{Let} \quad i[I-A)^{o} + \hat{M}^{o}]^{-1} = T$$

$$\text{and} \quad i[I-A)^{o} + \hat{M}^{1}]^{-1} = Q$$

$$\text{then} \quad M^{1}(QF^{1}) - M^{o}(TF^{o}) = [M^{1}(QF^{1}) - M^{o}(TF^{1})]$$

$$\{\text{changes in imports}\} = \{\text{changes due to IS}\}$$

$$+ \quad [M^{o}(TF^{1})-M^{o}(TF^{o})] \qquad \ldots\ldots (7)$$

(changes due to final demand)

The aggregate measure is obtained by the summation of estimates of IS for each industry. For the manufacturing sector as a whole, the change in final demand is split into (i) growth due to final demand on the assumption that a uniform growth rate (w) obtained from the terminal year final demand over base year final demand is applicable to all industries, and (ii) changes due to composition of final demand. This could be symbolically expressed as follows:

$$\Sigma M^{1}(QF^{1}) - M^{o}(TF^{o}) = \Sigma M^{1}(QF^{1}) - M^{o}(TF^{1})$$

$\{$changes in imports$\}$ $\{$changes due to IS)

$$+$$

$$\Sigma M^{o}(TF^{1}) - M^{o}(T\delta F^{o})$$

$\{$changes due to composition effect$\}$

$$+$$

$$\Sigma M^{o}(T\delta F^{o}) - M^{o}(TF^{o}) \qquad \ldots\ldots (8)$$

$\{$changes due to growth effect$\}$

Thus from equation (8) we could estimate the extent of IS in the manufacturing sector and the extent of change in final demand.

CHAPTER 3

IMPORTS & DOMESTIC PRODUCTION TRENDS IN THE MANUFACTURING SECTOR

The fact that India was able to achieve a diversified base due to its adoption of ISI has already been established in detail earlier. Domestic industry was to provide most of the country's capital goods requirements. However, the situation has reversed to an extent with the adoption of liberalization. In this section, the trends in imports, domestic production, import availability ratios and the likely policy effects on the manufacturing sector are examined.

3.1 Data Coverage and Adjustments

In order to analyse at constant prices, the value of output data for the manufacturing sector and the corresponding import data obtained at current prices need to be converted to constant prices. The price deflators used are the wholesale price index numbers compiled by the Ministry of Industry for the years 1974-75, 1979-80 and 1984-85, and the wholesale price index numbers compiled by Chandhok for the year 1969-70.[1] For the group consisting of manufacture of rubber, petroleum and coal products, the weights shown in Table 3.1 have been used to arrive at a composite index.

Table 3.1

Weights: Rubber, Petroleum and Coal Products

S.No	Sector	Weights
1.	Rubber and rubber products	1.207
2.	Petroleum crude and natural gas	0.602
3.	Coal mining	1.147

1. *Refer Appendix-III Table A.3.3. and A.3.4*

Table 3.2

Weights for the Various Items in the Group - Basic Metal and Alloy Industries

(1969-70 - 1984-85)

Sl. No.	Industry	1969-70	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
1.	Iron & Steel	52.9	64.59	70.8	77.04	59.28	58.81	66.39	72.3	64.96	75.77	77.87	73.51	70.2
2.	Copper	30.7	18.76	12.4	5.46	12.45	11.49	14.68	7.5	9.78	9.31	8.28	12.70	9.0
3.	Nickel	1.8	2.29	2.3	4.03	7.47	5.02	4.03	2.5	2.05	3.58	3.00	2.88	4.2
4.	Aluminium	0.9	0.74	0.5	2.38	0.62	2.54	4.53	8.6	15.54	3.83	1.70	2.96	7.6
5.	Lead	4.2	2.90	3.2	2.27	5.04	6.33	2.18	3.4	1.92	1.19	2.34	1.39	1.5
6.	Tin	5.4	3.34	9.4	3.52	5.52	6.41	3.51	3.9	2.36	2.42	1.27	1.70	5.4
7.	Zinc	4.1	7.38	1.5	5.24	9.60	9.39	4.68	1.8	3.39	3.90	5.56	4.81	2.1
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Monthly Statistics of Foreign Trade of India: March issues 1975, 1977, 1979, 1981, 1983 & 1985.

The unit value indices of imports have been used as price deflators for imports. The unit value indices of imports have been compiled from various issues of Indian Trade Journal (ITJ). Since the base year for the years 1969-70, 1974-75 and 1979-80 is 1968-69 and for 1984-85 it is 1978-79, the series has been spliced and brought to a common base i.e. 1970-71 = 100. Exact correspondence between the unit value index and the value of imports is possible for 9 out of 15 commodity groups in the manufacturing sector. For (i) leather and leather products, (ii) wood and wood products, (iii) non-metallic mineral products, (iv) rubber, petroleum and coal, the unit value import index has been worked out using the Paasche's formula. For textiles, the unit value import index of textile yarn and fabrics has been used as this item accounts for nearly 60 per cent of the textile imports. For food manufacture, the unit value index of food and food articles, which includes unprocessed cereals, fish and meat, has been used.

The unit value index of basic metal and alloy industries has been compiled by computing the weighted average of unit value indices of imports for iron and steel and non-ferrous metals; the weights being the proportion of imports of each item to total imports in that particular category (Table 3.2). As the unit value of import index for non-electrical machinery group has not been given in ITJ for 1984-85, it has been computed by taking the weighted average of individual indices belonging to the group. The weights assigned to the items in this group are shown in the following table:

Table 3.3

Weights: Non-electrical machinery

S.No.	Item	Weights
1.	Power generating machinery equipment	17.49
2.	Machinery specialized for particular industries	8.94
3.	Metal working machinery	14.62
4.	General industrial machinery and equipment	53.86
5.	Office machines and automatic data processing equipment	5.09
	Total	100.00

The unit value index for paper and paper products has been compiled by taking weighted average of the unit value price indices of pulp and waste paper, and paper, paperboard and articles. The weights for the reference years are shown in table 3.4.

Table 3.4

Weights: Paper and Paper Products

S.No.	Sector	1969-70	1974-75	1979-80	1984-85
1.	Pulp&Wastepaper	34.63	14.40	16.81	47.82
2.	Paper,paperboard and articles	65.37	85.60	83.19	52.18
	Total	100.00	100.00	100.00	100.00

The wholesale price indices for the period 1973-74 to 1984-85, for petroleum crude, chemical and chemical products, fertilizer, basic metal alloys, manufactures of metals, non-electrical machinery and electrical machinery have been compiled from the revised numbers of wholesale price indices (WPI). The unit value indices for these commodities for the similar period have been obtained from the various issues of Currency and Finance, Volume-II. These indices have been spliced and brought to a common base, i.e. 1970-71 = 100. The weights for ferrous & non-ferrous manufactures for the period 1973-74 to 1984-85 are presented in Table 3.2.

To estimate direct and indirect imports for the years 1973-74 and 1979-80, the 66 x 66 input-output matrix of the Fifth Plan and 89x89 input-output matrix of the Sixth Plan have been used. A correspondence has been made between sectors of the Fifth and Sixth Plan in accordance with ASI classification (refer Table 3.5). Imports and production data of 1973-74, given in the technical document of the Fifth Plan, are at 71-72 prices, and data regarding imports and production in 1979-80, given in the technical document of the Sixth Plan, are at 1979-80 prices. In order to express imports and production of 1979-80, at 71-72 prices, we have deflated imports and production of the various sectors by the appropriate unit value indices of imports and the wholesale prices respectively.

To arrive at the constant prices of imports with 1971-72 as the base year, 1979-80 with base 1970-71, has been changed to 1971-72. Similarly, for the wholesale price indices, the base has been changed to 1971-72 = 100 from base 1970-71. The general index has been used to deflate agro-based and service sector. For the food products group, manufactures of beverages, tobacco and tobacco products group, which includes, manufactures of food and manufactures of beverages, tobacco and tobacco products, a weighted average has been used.

Table 3.5
CORRESPONDENCE BETWEEN THE SECTORS OF THE FIFTH PLAN AND SIXTH PLAN

Sl. No.	ASI Code	Industry Group	Sectors Fifth Plan (66 x 66)	Sectors Sixth Plan (89 x 89)
1.	-	Agro-based and service sector	1-10, 62-66	1-19, 79-89
2.	20-21-22	Manufacture of food products	11-14	20-27
3.	23-26	Manufacture of Textiles	15-18, 28	28-35
4.	27	Manufacture of wood and wood products, furniture & fixtures	19	36
5.	28	Manufacture of paper & paper products, printing, publishing and allied industries	20, 61	37, 38
6.	29	Manufacture of Leather and leather fur products	21	39, 40
7.	30	Manufacture of Rubber, Petroleum and coal	22, 26, 30	41-44
8.	31	Manufacture of chemical & chemical products (except products of petroleum and coal)	23-25, 27, 29	45-53

Table 3.5 (Contd.)

Sl. No.	ASI Code	Industry Group	Sectors Fifth Plan (66 x 66)	Sectors Sixth Plan (89 x 89)
9.	32	Manufacture of non-metallic mineral products	31-33	54-56
10.	33	Basic metal and alloy industries	34-35	57-60
11.	34	Manufacture of metal products and parts except machinery	36-39	61
12.	35	Manufacture of machinery, machine tools and parts except electrical machinery	40, 42, 43	62-65
13.	36	Manufacture of electrical machinery, apparatus, appliances and supplies and parts	41, 44-51	66-71
14.	37	Manufacture of transport equipment and parts	52-57	72-76
15.	38	Miscellaneous manufacturing industries	58-60	77-78

Source: (i) A Technical note of the Fifth Plan 1974-79.
(ii) A Technical note on the Sixth Plan 1980-85

Table 3.6

Weights: Food Products

S.No.	Sector	Weights
1.	Food products	87.7
2.	Beverages	12.3

The indices that have been used as deflators are shown in Table 3.7

3.2 Structural Changes

In this section the structural changes between two points of time have been analysed by considering the changes in imports, production structure and import availability ratios. Whether there is any positive association between domestic industrial production and imports needs to be examined.

For this purpose, industries are classified as leading, lagging or constant, depending on whether imports/production shares are increasing, decreasing or remaining constant with reference to two points of time i.e. 1969-70 and 1984-85. The year 1969-90 has been chosen as during that period the manufacturing sector was experiencing import substitution and contrasted with 1984-85 when major changes in policy have taken place resulting in altered industrial structure. An attempt has been made to capture the impact of policy effects on the industrial structure and imports. The classification mentioned above is adopted at both current and constant prices. This is done since the classification differs significantly when adopting current and constant prices (refer Tables 3.8 & 3.9). The difference highlights the fact that growth in volume and growth in value have not moved in tandem.

Tables 3.8 and 3.9 reveal that basic structural changes relating to industrialisation took place. Consumer goods and intermediate manufactures which formed a smaller share in the import structure in 1969-70, formed a dominant share in 1984-85. In the production structure too, there was a shift from the dominant share of consumer goods in 1969-70, to the dominant share being occupied by basic and capital goods manufacture in 1984-85. A detailed analysis of structural shifts is examined below.

Table 3.7
INDEX NUMBERS OF WHOLESALE PRICES & IMPORTS FOR 1979-80

Sl. No.	ASI Code	Industry Group	Wholesale price index	Unit-value index of imports
1.	1-19 79-89	Agriculture and service	206.1	387.1
2.	20-27	Food products	180.6	392.8
3.	28-35	Textiles	185.4	187.9
4.	36	Wood and wood products	211.9	88.0
5.	37, 38	Paper and paper products	215.0	238.1
6.	39, 40	Leather and fur products	298.2	258.0
7.	41-44	Rubber, plastic, petroleum and coal	447.4	1433.0
8.	45-53	Chemical & chemical products	195.8	257.5
9.	54-56	Non-metallic mineral products	228.3	595.0
10.	57-60	Basic metal and alloy Ind.	246.4	264.8
11.	61	Metal products and parts except m/c.	220.7	357.2
12.	62-65	Machinery, machine tools and parts	208.0	444.6
13.	66-71	Electrical machinery	193.2	233.7
14.	72-76	Transport equipment	213.9	296.1
15.	77, 78	Miscellaneous industries	202.3	437.9

Source : Chandhok, WPI, ITJ.

Table 3.8

Leading, Lagging Industries - on the Basis of two Point Comparisons of the Percentage Distribution of Industrial Imports in the Indian Manufacturing Sector

(Percentage shares in total industrial imports)

Sl. No.	ASI	Code	Name of the Industry Group	Share in 1969-70 at current prices 1970-71=100	Share in 1969-70 at constant prices 1970-71=100	Share in 1984-85 at current prices 1970-71=100	Share in 1984-85 at constant prices 1970-71=100
	(A)		**Leading industrial imports both at current and constant prices in 1984-85 as compared to 1969-70:**				
1.	27		Wood and wood products furniture and fixtures	0.02	0.02	0.05	0.15
2.	29		Leather, leather and fur products0.01	0.01	0.07	0.19	
3.	31		Chemicals and chemical products	20.03	19.74	24.75	30.31
4.	32		Non-metallic mineral products	0.35	0.38	0.57	1.03
5.	34		Metal products and parts except machinery	0.80	0.79	1.32	2.08
6.	38		Other manufacturing industries	4.39	6.15	10.34	8.68
			Sub-total	25.60	27.09	37.10	42.44

	(B)	**Leading industrial imports at constant prices and lagging at current prices:**				
7.	23-26	Textiles	1.54	1.52	1.33	1.92
8.	33	Basic metal and alloy industries	14.43	15.49	10.34	18.22
9.	36	Electrical machinery, apparatus & applicances, supplies and parts	5.86	7.16	4.69	8.26
		Sub-total	21.83	24.17	16.36	28.40
	(C)	**Lagging industrial imports at current and constant prices:**				
10.	20-21	Food products	5.43	5.15	3.20	3.80
11.	22	Beverages	0.05	0.05	0.01	0.01
12.	28	Paper and paper products	3.79	3.98	2.87	3.37
13.	35	Machinery, machine tools & parts except electrical machinery	25.69	22.36	13.22	15.45
14.	37	Transport equipment and parts	4.58	3.95	2.57	3.04
		Sub-total	39.54	35.49	21.87	25.67
	(D)	**Lagging industrial imports at constant prices and leading at current prices:**				
15.	30	Rubber, plastic, petroleum and coal products	13.03	13.25	24.66	3.47

Source : MSITI, ITJ

Table 3.9

Leading, Lagging Industries - on the Basis of Two-Point Comparisons of the Percentage Distribution of Industrial Production in the Indian Manufacturing Sector

(Percentage shares in total industrial production)

Sl. No.	ASI	Code	Name of the Industry Group	Share in 1969-70 at current prices	Share in 1969-70 at constant prices 1970-71=100	Share in 1984-85 at current prices	Share in 1984-85 at constant prices 1970-71=100
	(A)		**Leading industrial production both at current and constant prices in 1984-85 as compared to 1969-70 at constant prices:**				
1.	30		Rubber, plastic, petroleum and coal products	4.96	4.70	10.91	5.07
2.	31		Chemical and chemical products	10.99	10.87	18.69	21.92
3.	35		Machinery, machine tools and parts except elec. machinery	5.25	5.46	6.20	6.55
4.	36		Electrical machinery, apparatus, appliances & supplies & parts	4.59	4.69	5.81	7.86
5.	37		Transport equipment and parts	5.89	5.63	6.09	6.44
			Sub-total	31.68	31.35	47.70	47.80

	(B)	**Leading industrial production at constant prices and lagging at current prices:**				
		None				
	(C)	**Lagging industrial production at current and constant prices:**				
6.	20-21	Food products	21.64	21.37	14.29	14.88
7.	22	Beverages, tobacco and tobacco products	3.56	3.54	2.08	2.80
8.	23-26	Textiles	19.63	20.22	10.83	13.25
9.	27	Wood and wood products	0.89	0.88	0.66	0.62
10.	28	Paper and paper products	3.39	3.21	3.21	3.03
11.	34	Metal products and parts except machinery	2.94	3.14	2.08	2.11
12.	38	Other manufacturing industries	1.82	1.71	0.79	1.13
		Sub-total	53.87	54.06	33.94	37.82
	(D)	**Lagging industrial production at constant prices and leading at current prices:**				
13.	29	Leather and fur products	0.82	0.75	0.90	0.74
14.	32	Non-metallic mineral products	3.29	3.27	4.04	3.21
15.	33	Basic metal and alloy industries	10.35	10.54	13.42	10.38
		Sub-total	14.46	14.56	18.36	14.33

Source: ASI, Chandhok,

3.2.1 Structural shifts in industrial imports

Seven leading industrial imports, which accounted for 39 per cent of imports at current prices, increased their share to 62 per cent, whereas, at constant prices, there are nine leading industrial import groups whose share increased from 1969-70 (51 per cent) to 1984-85 (71 per cent). Rubber, petroleum and coal and chemicals group together account for 49.4 per cent of total imports at current prices in 1984-85. Chemicals account for 30 per cent of total imports at constant prices, in 1984-85. Rubber, petroleum and coal products, which belong to the leading group at current prices, lag behind at constant prices.

3.2.2 Structural shifts in industrial production

From Table 3.9, we notice that there are eight leading industries at current prices and their share in total production increased from 46 per cent in 1969-70 to 66 per cent, whereas at constant prices, there are only five industries showing increased share in total production. Their share is 48 per cent in 1984-85. Chemicals share in total production is highest at both current and constant prices. A major decline in the share of textiles to total value of production is noticed at current prices.

3.2.3 Interaction and inter-dependence between industrial imports and production

Table 3.10 shows the industries, where there is an increase in imports well as production in 1984-85 as compared to 1969-70. Most of these are intermediate goods and despite marked increases in production the demand is so high that imports of these goods are resorted to.

Table 3.11 shows the industries, where there is a decline in imports and production in 1984-85 as compared to 1969-70. The industries that fall in this group are mostly consumer goods. The magnitude of these industries show that they exert a weak pull on imports, but despite the decline in production, their contribution to the total share is quite substantial.

Table 3.10

Percentage share of leading industries and leading industrial imports in the Indian Manufacturing Sector

S.No.	ASI Code	Industry Group	Share in 1969-70		Share in 1984-85	
			Imports	Production	Imports	Production
					(At current prices)	
1.	29	Leather & fur products	0.01	0.82	0.07	0.90
2.	30	Rubber, petroleum and coal products	13.03	4.96	24.66	10.91
3.	31	Chemical and chemical products	20.03	10.99	24.75	18.69
4.	32	Non-metallic mineral	0.35	3.29	0.57	4.04
		Total	33.42	20.06	50.05	34.54
					(At constant prices)	
1.	31	Chemical and chemical products	19.74	10.87	30.31	21.92
2.	36	Electrical machinery	7.16	4.69	8.26	7.86
		Total	26.90	15.56	38.57	29.78

Table 3.11

Percentage share of lagging industries and industrial imports in the Indian Manufacturing Sector

S.No.	ASI Code	Industry Group	Share in 1969-70		Share in 1984-85	
			Imports	Production	Imports	Production
			(At current prices)			
1.	20-21	Food products	5.43	21.64	3.20	14.29
2.	22	Beverages, tobacco and tobacco products	0.05	3.56	0.01	2.08
3.	23-26	Textiles	1.54	19.63	1.33	10.83
4.	28	Paper and paper products	3.79	3.39	2.87	3.21
		Total	10.81	48.22	7.41	30.41
			(At constant prices)			
1.	20-21	Food products	5.15	21.37	3.80	14.88
2.	22	Beverages, tobacco & tobacco products	0.05	3.54	0.01	2.80
3.	28	Paper and paper products	3.98	3.21	3.37	3.03
		Total	9.18	28.12	7.18	20.71

Table 3.12

Percentage Share of Leading Industries and Lagging Imports

S.No.	ASI Code	Industry Group	Share in 1969-70		Share in 1984-85	
			Imports	Production	Imports	Production
			(At current prices)			
1.	33	Basic metal and alloys	14.43	10.35	10.34	13.42
2.	35	Non-electrical machinery	25.69	5.25	13.22	6.20
3.	36	Electrical machinery	5.86	4.59	4.69	5.81
4.	37	Transport equipment & parts	4.58	5.89	2.57	6.09
		Total	50.56	26.08	30.82	31.52
			(At constant prices)			
1.	30	Rubber, Petroleum and coal products	13.25	4.70	3.47	5.07
2.	35	Non-electrical machinery	22.36	5.46	15.45	6.55
3.	37	Transport equipment & parts	3.95	5.63	3.04	6.44
		Total	39.56	15.79	21.96	18.06

Table 3.12 shows increase in production and a decline in imports of petroleum, non-electrical machinery and transport equipment. This would imply that import substitution took place in this group of industries.

Table 3.13

Percentage Share of Lagging Industries and Leading Imports

S.No.	ASI Code	Industry Group	Share in 1969-70		Share in 1984-85	
			Imports	Production	Imports	Production
			(At current prices)			
1.	27	Wood and wood products	0.02	0.89	0.05	0.66
2.	34	Metal products	0.80	2.94	1.32	2.08
3.	38	Other manufacturing industries	4.39	1.82	10.34	0.79
		Total	5.21	5.65	11.71	3.53
			(At constant prices)			
1.	23-26	Textiles	1.52	20.22	1.92	13.25
2.	27	Wood and wood products	0.02	0.88	0.15	0.62
3.	29	Leather & fur products	0.01	0.75	0.19	0.74
4.	32	Non-metallic mineral products	0.38	3.27	1.03	3.21
5.	33	Basic metal and alloys	15.49	10.54	18.22	10.38
6.	34	Metal products	0.79	3.14	2.08	2.11
7.	38	Other manufacturing industries	6.15	1.71	8.68	1.13
	Total		24.36	40.51	32.27	31.44

Table 3.13 shows industries in which there is more import dependence in 1984-85 as compared to 1969-70. In this category are consumer goods, basic metal alloy and miscellaneous manufacturing industries.

The above analysis is based on the two digit level of aggregation. Industries are categorised into a broader group namely use-based and input based classification. The shares in production and imports at four points of time are now analysed.

Table 3.14 shows changes in the shares of imports and production according to use-based classification, at current prices. In interpreting these figures, the point to be borne is that figures are at current prices and hence the price effect is included in the value of imports and production. The share of capital goods in imports is the highest in 1969-70 (34 per cent), considerable decline is visible in this category upto 1984-85 (19 per cent) whereas their share in production remained around 15 per cent. The share of intermediate goods is high in 1974-75 (37 per cent). The reason why intermediate goods grew more rapidly is because of increase in the oil price in 1973. There is a slight increase in the share of intermediate goods in 1979-80 to 1984-85 (from 19 per cent to 21 per cent). Drastic decline in imports is noticeable during the same period (from 45 per cent to 32 per cent). This could imply import substitution. The steady decline in consumer non-durable imports accompanied by a steady increase in production may imply that India is moving towards self- sufficiency.

From Table 3.15, we notice that there is a considerable decline in the production of agro-based goods. These are processed commodities of agricultural origin and a decline in their share at constant prices could imply a decline in agricultural production or under utilization of capacity. But since our input-based data are at current prices, it may not be possible to make the above statement. There is also a decline in imports of agro-based commodities upto 1979-80 after which there is an increase.

Table 3.14

Change in the Shares by Major Industry Groups Imports/Production: Use-Based Classification (1969-70 to 1984-85)

(Per cent)

		1969-70	1974-75	1979-80	1984-85
A.	**IMPORTS**				
1.	Basic goods	31.93	36.98	30.04	32.12
2.	Intermediate goods	19.46	37.12	45.11	32.21
3.	Capital goods	34.18	17.65	14.05	18.93
4.	Consumer goods:				
	(a) Durables	6.35	3.99	7.68	11.89
	(b) Non-durables	8.08	4.26	3.12	4.86
B.	**PRODUCTION**				
1.	Basic goods	22.84	23.37	26.10	29.61
2.	Intermediate goods	27.77	19.05	20.72	21.25
3.	Capital goods	15.10	14.42	15.07	14.81
4.	Consumer goods:				
	(a) Durables	2.45	3.2	3.36	3.51
	(b) Non-durables	31.84	39.95	34.74	30.82

Source: MSFTI, ASI.

Table 3.15

Changes in the Shares of Major Industry Groups in Industrial Imports/Production: Input Based Classification (1969-70 to 1984-85)

(Per cent)

		1969-70	1974-75	1979-80	1984-85
A.	**IMPORTS**				
1.	Agro-based	10.84	5.74	5.10	7.53
2.	Chemical based	33.06	54.57	56.33	49.41
3.	Metal based	55.75	39.43	37.26	42.48
B.	**PRODUCTION**				
1.	Agro-based	49.92	42.34	36.59	31.97
2.	Chemical based	15.95	23.43	26.71	29.61
3.	Metal based	30.83	31.36	33.76	34.38

Note: The input-based classification is not exhaustive.

Source: MSFTI, ASI.

The salient features of structural changes in imports and production could be briefly summarised as follows. A marked increase in import of intermediate goods is noticeable upto 1979-80 after which there is a decline. There is an initial decline in production (1974-75) but later there is a steady rise. There is an increase in the share of imports and production of consumer durables.

While the share of consumer non-durables in imports declined, its share in production increased. The underlying factors resulting in structural changes could have been induced by various policy measures. The first round oil price increase expanded domestic production of petroleum. The strategy of import substitution which is evident in this industry resulted in a smooth adjustment process in production, when the second oil price hike took place in 1979. The liberalization process involving broad banding, delicencing of industries resulted in an increase of imports in intermediate and capital goods. The impact of such changes on industry are also examined in a later section.

3.3 Growth Pattern in Manufacturing and Industrial Imports

The analysis of growth rates of imports and production would give us a glimpse of whether there is import substitution or import dependence. Compound growth rates of imports and production in the manufacturing sector are presented in Tables (3.16 and 3.17) both at constant and current prices. The period examined is from 1969-70 to 1984-85, along with sub-periods 1969-70 to 1974-75, 1974-75 to 1979-80 and 1979-80 to 1984-85. These periods and sub-periods as mentioned earlier are selected with the specific purpose of ascertaining the impact of policy changes on the manufacturing sector and imports.

The manufacturing sector as a whole recorded a moderate rate of growth in the value of output at 6 per cent per annum during 1969-70 to 1984-85. The relatively fast growing industries are rubber, plastic, petroleum and coal products, chemicals, non-electrical machinery, electrical machinery and transport equipment. The consumer oriented industries namely food products and textiles, are among the slow growing industries.

The manufacturing sector recorded 7.5 per cent growth rate in imports during 1969-70 to 1984-85. A significant decline in imports of rubber, plastic, petroleum and coal products is noticeable. Apparently, in this industry import substitution has taken place in a big way. High growth rates in wood and wood products and leather and fur products are observed. As their contribution to total imports is insignificant (i.e. their share is less than 5 per cent of total imports) they have not had a significant impact on the overall growth rate of imports. Metal products and non-metallic mineral products, experienced high growth rate of imports at 15 per cent per annum. The growth rates of various sub-periods are presented in Tables 3.16 & 3.17. The major findings are highlighted below.

For the period 1969-70 to 1974-75, imports increased at 5 per cent per annum while production increased at 3 per cent per annum. Imports of food products, textiles, paper and paper products and machinery and machine tools industries, registered negative growth rates. In contrast, except food products, production of all other industries, recorded positive growth rates. The above pattern could be due to import substitution.

For the period 1974-75 to 1979-80, the aggregate growth rate for both imports and production is 8 per cent per annum. As compared to the earlier period, there is a significant increase in both imports and production. There are 4 industries whose imports declined but their production expanded. These industries include food products, beverages, tobacco and tobacco products, leather and fur products and non-electrical machinery. Moreover,

Table 3.16

Compound Growth Rates of Imports (Based on 70-71 Prices)

(Per cent)

Sl. No.	ASI Code No.	Industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1974-75 to 1984-85	1969-70 to 1984-85
1.	20-21	Food products	-5.65	-1.83	26.32	11.36	5.38
2.	22	Beverages, tobacco and tobacco products	-4.3	-15.33	16.09	-0.85	-2.01
3.	23-26	Textiles	-4.93	22.17	12.17	17.06	9.22
4.	27	Wood and wood products, furniture and fixtures	27.16	42.55	4.62	22.12	23.78
5.	28	Paper and paper products, publishing and allied industries	-5.36	18.81	6.95	12.72	6.34
6.	29	Leather and leather products	10.79	-16.42	173.52	51.20	36.31
7.	30	Rubber, plastic, petroleum and coal products	6.04	0.32	-3.94	-5.29	-1.6
8.	31	Chemical and chemical products	6.57	15.36	10.19	12.74	10.65
9.	32	Non-metallic mineral products	9.88	17.98	17.06	17.52	14.92
10.	33	Basic metal and alloy industries	13.76	9.72	2.90	6.26	8.70
11.	34	Metal products and parts except machinery	15.32	12.83	15.97	14.39	14.70
12.	35	Machinery, machine tools and parts except electrical machinery	-2.71	-5.92	26.15	8.94	4.91

Table 3.16 (Contd.)

Sl. No.	ASI Code No.	Industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1974-75 to 1984-85	1969-70 to 1984-85
13.	36	Electrical machinery	6.19	0.09	20.36	9.76	8.56
14.	37	Transport equipment	10.07	12.75	-4.95	3.52	5.66
15.	38	Miscellaneous industries	-3.69	17.42	17.79	17.60	10.02
		Manufacturing sector	4.64	8.21	9.80	9.00	7.5

Source: MSFTI, ITJ.

Table 3.17

Compound Growth Rates of Production (Based on 70-71 Prices)

(Per cent)

Sl. No.	ASI Code No.	Industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1974-75 to 1984-85	1969-70 to 1984-85
1.	20-21	Food products	-2.1	8.08	3.90	5.97	3.20
2.	22	Beverages, tobacco and tobacco products	-0.27	5.52	7.15	6.33	4.08
3.	23-26	Textiles	0.80	5.47	2.14	3.79	2.79
4.	27	Wood and wood products, furniture and fixtures	6.80	4.54	-	2.22	3.28
5.	28	Paper and paper products, publishing and allied industries	3.69	5.37	6.85	6.11	5.30
6.	29	Leather and leather products	3.55	10.63	2.87	6.68	5.63
7.	30	Rubber, plastic, petroleum and coal products	3.07	5.98	9.86	7.90	6.23
8.	31	Chemical and chemical products	12.68	12.52	7.25	9.85	10.79
9.	32	Non-metallic mineral products	1.62	5.76	9.60	7.66	5.61
10.	33	Basic metal and alloy industries	3.47	8.60	4.83	6.70	5.61
11.	34	Metal products and parts except machinery	-0.59	6.94	2.64	4.77	2.95
12.	35	Machinery, machine tools and parts except electrical machinery	7.63	7.21	6.19	6.70	7.01

Table 3.17 (Contd.)

Sl. No.	ASI Code No.	Industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1974-75 to 1984-85	1969-70 to 1984-85
13.	36	Electrical machinery	8.98	11.24	8.05	9.63	9.41
14.	37	Transport equipment	4.90	6.85	8.32	7.58	6.68
15.	38	Miscellaneous industries	-13.49	13.95	10.35	12.13	2.85
		Manufacturing sector	3.20	8.26	5.77	7.01	5.72

Source: ASI, Chandhok, WPI.

imports of rubber, plastic, petroleum and coal products and electrical machinery registered low growth rates of 0.3 and 0.1 per cent per annum. In contrast growth rates in production were 6 per cent in rubber, plastic, petroleum and coal products and 11 per cent in electrical machinery.

During 1979-80 and 1984-85, the growth rate of imports accelerated (10 per cent per annum), whereas the growth rate of production declerated (6 per cent per annum). Imports of food products and non-electrical machinery increased at a rate greater than 25 per cent and of electrical machinery at 20 per cent. Only imports of rubber, plastic, petroleum and coal products and transport equipment showed negative growth rates. The major findings of the sub-period analysis are highlighted below.

The growth pattern across industries shows that the industry groups that recorded low growth in imports in the sub-period 1974-75 to 1979-80 showed high growth in production. In this category are rubber, plastic, petroleum and coal products. A reversal of the pattern set in the sub-periods before 1979-80 is noticeable for sub-period 1979-80 to 1984-85, in the case of electrical, non-electrical machinery and transport equipment. During 1979-80 to 1984-85, major changes in trade policy took place. 'Automatic licencing' was introduced, moreover, facilities for export linked licences were enhanced by 10 per cent for engineering, chemicals and allied products, leather and leather goods and cotton textiles. The favourable turn in trade balances during this period, due to increase in non-resident remittances have set the pace for progressive liberalization. The increase in imports of capital goods and intermediate goods could thus be attributed to the liberalization policies.

Growth pattern: Use-based and Input-based groups 1969-70 to 1984-85

The analysis at this intermediate level enables examination of the growth rates of imports and production across certain economically meaningful groups of industries. Since appropriate price deflators were not available, the analysis of the use-based classification is based on current prices (Table 3.18). Input- based classification is presented at both current and constant prices (Tables 3.19 and 3.20). Groups 20-29 of the ASI are classified as agro-based, groups 30-31 as chemical based and groups 33-38 as metal-based.

Table 3.18 shows the differential nature of growth across industries. This is due to the inbuilt biases of the industrial strategy. The pattern of differential growth is also observed in the case of imports. In the case of basic goods there is a decline in the growth rate of imports. In the case of intermediate goods, high growth rate of imports is witnessed in 1969-70 to 1974-75.

During the period 1979-80 to 1984-85, there is sharp decline in the growth rate of imports. In the case of capital and consumer durables, a steady increase in imports is noticeable. Since these growth rates are based on current prices, the price effect is included. In the case of production, a drastic change is visible in intermediate goods.

Table 3.19 and 3.20 present growth rates of imports and production on the basis of input-based classification at both current and constant prices. The chemical based industries show high growth rates of imports and production for the entire period 1969-70 to 1984-85 and also during the sub-period 1974-75 to 1979-80, i.e. the period of the first and second oil hikes. High growth rates of imports as compared to production are witnessed in agro-based industries.

So far, the analysis was based on variations between two periods of time. Since inter-period variations are also to be taken into account, the analysis is extended to a few commodities covering sub-periods between 1973-74 to 1979-80 and 1979-80 to 1984-85. (Table 3.21)

For the period 1973-74 to 1979-80, trend growth rate of production in crude petroleum and chemicals is high. Growth is highest in the fertilizer industry (18 per cent per annum). In the case of machinery and machine tools, import substitution in the form of negative growth in imports is visible. When we examine the period 1979-80 to 1984-85, we notice a reversal in the trend growth rates. Industries which are relatively fast growing in earlier period, experienced significant slow down in growth as regards production, accompanied by an increase in imports. For instance, the growth rate of non-electrical machinery declined to 6 per cent per annum during 1979-80 to 1984-85 and in contrast the growth rate of imports increased to 32 per cent per annum. But, in the case of electrical machinery, the growth rate of production remained at 8 per cent per annum but the growth rate of imports rose to 23 per cent. The industrial sector shows greater impact of structural changes during 1979-80 to 1984-85. The set of industrial policies followed since 1978-79, seems to have altered the existing structure.

3.4 Import-availability Ratios

Import co-efficients computed from the technical documents of the Fifth and Sixth Plan for two years i.e. 1973-74 and 1979-80, are shown in table 3.22. The table reveals that for seven industries import co-efficients are higher in 1979-80. These include, food and beverages, textiles, wood and wood products, basic metal and alloy industries, electrical machinery, transport equipment and miscellaneous industries. However, the increase in

Table 3.18

Compound Growth Rates of Imports/Production Use-Based Classification (1969-70 to 1984-85)

(Per cent)

		1974-75 over 1969-70	1979-80 over 1974-75	1984-85 over 1979-80	1979-80 over 1969-70	1984-85 over 1974-75	1984-85 over 1969-70
	IMPORTS						
1.	Basic goods	30.25	14.36	12.65	22.04	13.50	18.82
2.	Intermediate goods	43.92	23.95	3.90	33.57	13.49	22.84
3.	Capital goods	10.82	13.90	17.97	12.35	15.91	14.19
4.	Consumer goods						
	(a)Durables	15.24	35.92	21.30	25.16	28.40	23.86
	(b)Non-durables	11.30	11.95	21.47	11.62	16.61	14.81
	Total	26.48	19.21	11.15	22.79	15.51	18.78
	PRODUCTION						
1.	Basic goods	17.10	17.10	17.6	17.1	17.4	17.3
2.	Intermediate goods	8.1	16.5	15.3	12.2	15.9	13.3
3.	Capital goods	15.5	15.6	14.3	15.5	14.9	15.1
4.	Consumer goods						
	(a)Durables	23.1	15.6	15.7	19.3	15.6	18.1
	(b)Non-durables	22.2	11.4	12.0	16.58	11.7	15.0

Source: MSFTI, ASI.

Table 3.19

Compound Growth Rates of Imports/Production Input-Based Classification

(Per cent)

	1974-75 over 1969-70	1979-80 over 1974-75	1984-85 over 1979-80	1979-80 over 1969-70	1984-85 over 1974-75	1984-85 over 1969-70
IMPORTS						
1. Agro-based	11.37	16.43	20.16	13.88	18.28	15.93
2. Chemical-based	39.82	20.06	8.10	29.56	13.97	22.01
3. Metal based	18.01	17.87	14.10	17.94	15.97	16.65
PRODUCTION						
1. Agro-based	12.83	11.25	11.46	12.03	11.46	11.91
2. Chemical-based	25.93	17.58	17.35	21.68	17.35	20.14
3. Metal based	17.00	16.25	15.70	16.62	15.70	16.13

Source: MSFTI, ASI.

Table 3.20

Compound Growth Rates of Imports & Production Input-Based Classification

(Per cent)

	1974-75 over 1969-70	1979-80 over 1974-75	1984-85 over 1979-80	1979-80 over 1969-70	1984-85 over 1974-75	1984-85 over 1969-70
IMPORTS						
1. Agro-based	-5.3	11.81	14.49	2.90	13.14	6.62
2. Chemical-based	6.36	10.35	6.43	8.34	8.37	7.70
3. Metal based	5.12	6.20	11.29	5.66	8.72	7.51
PRODUCTION						
1. Agro-based	-0.14	6.58	3.57	3.17	5.07	3.30
2. Chemical-based	10.12	11.22	7.71	10.67	9.45	9.68
3. Metal based	4.38	8.53	6.43	6.43	7.47	6.43

Source: Based on Table A.

Table 3.21

Annual Average Growth Rate of Imports, Production and Supply of Selected Industries

	Imports		Production		Supply	
	1973-74 to 1979-80	1979-80 to 1984-85	1973-74 to 1979-81	1979-80 to 1984-85	1973-74 to 1979-80	1979-80 to 1984-85
1. Crude petroleum	4.7	8.1	11.8	16.7	7.2	6.2
2. Chemical and chemical products	24.4	12.5	10.5	7.8	10.7	7.8
3. Fertilizers	8.8	44.1	18.3	8.1	16.0	8.4
4. Basic alloy metals	13.8	3.9	8.4	4.6	8.6	4.4
5. Manufacturers of metal products	9.2	20.9	3.9	2.9	4.0	4.0
6. Machinery except electrical	8.3	31.8	9.0	6.4	5.2	9.2
7. Electrical machinery	4.7	23.1	8.1	8.6	6.9	9.6

import co-efficient is marginal for textiles and substantial for others. Broadly the results conform with the pattern of import- availability ratios, that has been computed for the four year period, the exception being in the case of food and beverages and electrical machinery, where one notices a decline from 1969-70 to 1979-80.

Tables 3.23 and 3.24 depict the import-availability ratios for four points of time at current and constant prices. On the basis of the movements of the import-availability ratios, we classify industry groups into five categories. The observed changes in the ratio provide a broad measure of import substitution.

Table 3.22

Import Co-efficients for 1973-74 and 1979-80

Sl No.	ASI Code	Industry group	1973-74 at 71-72 prices	1970-80 at 71-72 prices	1979-80 at current prices
1.	-	Agriculture & service sector	0.0197	0.0134	0.0252
2.	20- 21- 22	Food products Beverages Tobacco & tobacco products	0.0150	0.0259	0.0563
3.	23- 26	Textiles	0.0034	0.0035	0.0036
4.	27	Wood & wood products, furniture & fixtures	0.0003	0.0021	0.0009
5.	28	Paper & paper products, printing, publishing and allied industries	0.2455	0.1323	0.1466
6.	29	Leather, leather & fur products	0.0002	0.0002	0.0002
7.	30	Rubber, petroleum & coal products	0.2116	0.0841	0.2694
8.	31	Chemical & chemical products	0.2685	0.1389	0.1820
9.	32	Non-metallic mineral products	0.0426	0.0122	0.0317
10.	33	Basic metal & alloy industries	0.2003	0.2723	0.2927
11.	34	Metal products & parts except machinery	0.0109	0.0106	0.0172
12.	35	Machinery, machine tools & parts except electrical machinery	2.5603	0.1064	0.2274
13.	36	Electrical machinery, apparatus, appliances & supplies & parts	0.0482	0.1013	0.1226
14.	37	Transport equipment & parts	0.0238	0.050	0.0703
15.	38	Miscellaneous industries	0.0155	0.0320	0.0692

Notes: 1. Import co-efficient obtained from $\frac{mi}{1-mi}$ where $mi = \frac{Mi}{Zi}$

where Z = X + M, Z = supply,
X = Production & M = imports.

2. Value of Production at current prices were deflated using wholesale prices with base 71=72, and import prices were deflated by using unit value of import indices (refer table 3.7)

Source: Derived from the technical note of the Fifth & Sixth Plan documents.

Table 3.23

Import - Availability Ratios

(At current prices)

S.NO.	ASI code	Industry group	1969-70	1974-75	1979-80	1984-85
1.	20-21	Food products	0.0235	0.0223	0.0202	0.0325
2.	22	Beverages, tobacco & tobacco produ	0.0013	0.0013	0.0004	0.0008
3.	23-26	Textiles	0.0075	0.0057	0.0100	0.0181
4.	27	Wood & wood products, furniture and fixtures	0.0022	0.0069	0.0139	0.0114
5.	28	Paper & paper products, printing, publishing & allied industries	0.0970	0.0817	0.1246	0.1182
6.	29	Leather, leather & fur products	0.0007	0.0008	0.0003	0.0116
7.	30	Rubber, plastic, petroleum & coal products	0.2011	0.4090	0.4338	0.2532

Table 3.23 (Contd.)

S.NO.	ASI code	Industry group	1969-70	1974-75	1979-80	1984-85
8.	31	Chemicals & chemical products (exc products of petroleum & coal)	0.1487	0.1572	0.1490	0.1657
9.	32	Non-metallic mineral products	0.0100	0.0129	0.0624	0.0208
10.	33	Basic metal & alloy industries	0.1179	0.1848	0.1693	0.1036
11.	34	Metal products & parts except mach.	0.0255	0.0436	0.0803	0.0871
12.	35	Machinery, machine tools & parts et electrical machinery	0.3194	0.2108	0.1858	0.2422
13.	36	Electrical machinery, apparatus, appliances & supplies & parts	0.1089	0.0978	0.0775	0.1080
14.	37	Transport equipment & parts	0.0694	0.0828	0.1080	0.0595
15.	38	Other manufacturing industries	0.1878	0.3445	0.5810	0.6633
		Total	0.0875	0.1258	0.1495	0.1304

Source: Derived from Tables A.3.1 & A.3.2.

Table 3.24

Import - Availability Ratios

(At constant prices 1970-71 = 100)

S.NO.	ASI code	Industry group	1969-70	1974-75	1979-80	1984-85
1.	20-21	Food products	0.0218	0.0182	0.0114	0.0296
2.	22	Beverages, tobacco & tobacco produ	0.0013	0.0011	0.0004	0.0005
3.	23-26	Textiles	0.0069	0.0052	0.0107	0.0170
4.	27	Wood & wood products, furniture and fixtures	0.0020	0.0050	0.0230	0.0288
5.	28	Paper & paper products, printing, publishing & allied industries	0.1030	0.0678	0.1171	0.1175
6.	29	Leather, leather & fur products	0.0007	0.0009	0.0002	0.0292

Table 3.24 (Contd.)

S.NO.	ASI code	Industry group	1969-70	1974-75	1979-80	1984-85
7.	30	Rubber, petroleum & coal products	0.2073	0.2316	0.1864	0.0757
8.	31	Chemicals & chemical products (exc products of petroleum & coal)	0.1441	0.1130	0.1262	0.1418
9.	32	Non-metallic mineral products	0.0107	0.0157	0.0268	0.0369
10.	33	Basic metal & alloy industries	0.1198	0.1795	0.1872	0.1735
11.	34	Metal products & parts except mach.	0.0229	0.0468	0.0603	0.1058
12.	35	Machinery, machine tools & parts et electrical machinery	0.2751	0.1863	0.1065	0.2199
13.	36	Electrical machinery, apparatus, appliances & supplies & parts	0.1239	0.1105	0.0683	0.1116
14.	37	Transport equipment & parts	0.0611	0.0765	0.0978	0.0435
15.	38	Other manufacturing industries	0.2495	0.3623	0.3977	0.4778
		Total (a)	0.0848	0.0904	0.0902	0.1068
		(b)	0.0833	0.0953	0.0960	0.1076

Notes: (a) Refers to the total imports of all industries.
(b) Total Imports deflated by the general index.

Source: Derived from Tables A.3.3 & A.3.4.

Category-1

This category consists of those industry groups whose import-availability ratio was low to start with and remained so for most of the period. In this case the scope of import substitution is rather low. They are beverages, tobacco and tobacco products, leather and fur products.

Category-2

This category consists of those industry groups whose import-availability ratio has fallen appreciably. In this category would fall industries where import substitution is strong. They are rubber, petroleum and coal products and transport equipment.

Category-3

This category consists of those industry groups, whose import availability has fallen appreciably till 1979-80, and has then dramatically risen. Non-electrical machinery and electrical machinery, fall under this category. These industries have taken advantage of the liberalization process.

Category-4

This category consists of those industry groups whose import availability ratio increased and remained so, throughout the period. In this case, the scope for import substitution is limited. The industries falling in this category are other manufacturing industries, metal products and parts, textiles, non-metallic mineral products.

Category-5

In this category are those industries, which experience wide fluctuations in the import-availability ratios. They are chemicals, paper and paper products, wood and wood products and metal products. The variations could be attributed to frequent changes in policy.

Trends in import availability ratios for some of the major industries for the period 1973-74 to 1984-85 are presented in Table 3.25. They are presented at both current and constant prices. After the first oil price hike, upto 1978-79, there is a steady decline in the import-availability ratio. After the second oil hike in 1979, there is an increase in this ratio, but later there is a decline. This evidence is noticeable at both current and constant prices. In

Table 3.25

Trends in Import Availability Ratios Since 1973-74 Using Current & Constant Prices

Years/Industry group	Petroleum crude		Chemicals chemical products		Fertilizer		Basic metal alloy industries		Metal products		Non-electrical machinery		Electrical machinery	
	Current	Constant	Current	Constant	Current	Constant	Current	Constant	Current	Constant	Current	Constant	Current	Constant
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1973-74	0.5913	0.5809	0.1289	0.1211	——	——	0.1592	0.1787	0.0425	0.0551	0.2860	0.2703	0.1002	0.1312
1974-75	0.5152	0.5002	0.1572	0.1130	0.3592	0.2790	0.1848	0.1787	0.0436	0.0468	0.2108	0.1863	0.0978	0.1105
1975-76	0.4754	0.4360	0.1391	0.0829	0.3271	0.2049	0.1183	0.1056	0.0449	0.0496	0.2503	0.1867	0.1008	0.0969
1976-77	0.4578	0.4056	0.0987	0.0839	0.1678	0.1563	0.0964	0.0965	0.0421	0.0403	0.2786	0.1954	0.0827	0.0737
1977-78	0.4270	0.3829	0.2018	0.1793	——	——	0.1092	0.1091	0.0808	0.0631	0.2253	0.1348	0.0722	0.1381
1978-79	0.4224	0.3885	0.2070	0.1812	0.2136	0.1877	0.1377	0.1424	0.1049	0.0580	0.2213	0.1416	0.0837	0.0820
1979-80	0.5171	0.4970	0.1490	0.1262	0.1791	0.1339	0.1693	0.1831	0.0803	0.0603	0.1906	0.1095	0.0837	0.0820
1980-81	0.5728	0.5471	0.1739	0.1435	0.2455	0.1984	0.1597	0.1918	0.0966	0.0734	0.2136	0.1978	0.0837	0.0683
1981-82	0.4914	0.4326	0.1516	0.1330	0.1536	0.1236	0.1561	0.2113	0.0978	0.0762	0.2240	——	0.0750	——
1982-83	0.4366	0.3727	0.1034	——	0.0595	0.0558	0.1316	0.1948	0.0756	0.0515	0.2277	0.2419	0.0921	0.1196
1983-84	0.4183	0.3410	0.1289	0.1303	——	——	0.1312	0.1999	0.0811	0.0818	0.2904	0.2869	0.0883	0.1317
1984-85	0.3128	0.2280	0.1657	0.1418	0.2115	0.1600	0.1036	0.1735	0.0871	0.1058	0.2423	0.2199	0.1218	0.1238

the case of chemicals there are wide fluctuations. Fertilizer, which is an important industry in the chemicals group, showed the highest import-availability ratio in 1980-81, declined till 1983-84, and again rose in 1984-85. An increasing import-availability ratio is evident in non-electrical machinery from 1980-81. In the case of metal products and electrical machinery, we notice divergent trends in current and constant prices.

From the analysis of the import-availability ratios, it is observed that because import-substitution strategy of industrialisation was being followed, the response to the oil price increases was smooth. Since the liberalization policies began in 1980, we observe an increase in import availability ratio in the case of non-electrical machinery. Whereas in the case of chemicals and fertilizers there were frequent changes in policy, this being evident from the movements in import-availability ratios depicted in Chart 3.1. That recent liberalization policies have increased importation, resulting in the widening of the balance of trade deficit whereas the adoption of IS strategy of industrialisation had insulated the economy from high rate of inflation that was experienced abroad, cannot be denied. In the following section, trends in import prices and domestic prices in some selected commodities are examined so as to gauge the movement of price increase.

3.5 Divergent Trends : Wholesale Price Index Vs Unit Value Import Index

In the analysis of data on production, imports and availability, focus of attention has been on constant prices, the reason for this is that notices divergences between the two series based on current and constant prices. This demonstrates the fact that there are divergences in the domestic output prices and import prices.

Bokil et al (1981) in their analysis of import substitution, based it on current prices, on the premise that use of ratios in computations reduce the price effect, whereas Sastry (1988) has clearly pointed out that there are price changes and this affects the import availability ratios. In his study on the capital and intermediate goods industries for the period 1960-80, with various sub-periods, he notices divergences in domestic output prices and import prices. In the current study too this feature is visible. A close examination of the four-point-series and trends in the wholesale price index and the unit value of import index are shown in Tables 3.26 and 3.27. One notices that there are substantial changes between the two. So, the price changes have to be taken into consideration while analysing import-availability ratios.

The trends in the unit value of imports and wholesale price indices show in Chart 3.2 that in the case of petroleum crude, there is an upward turn

CHART 3.1

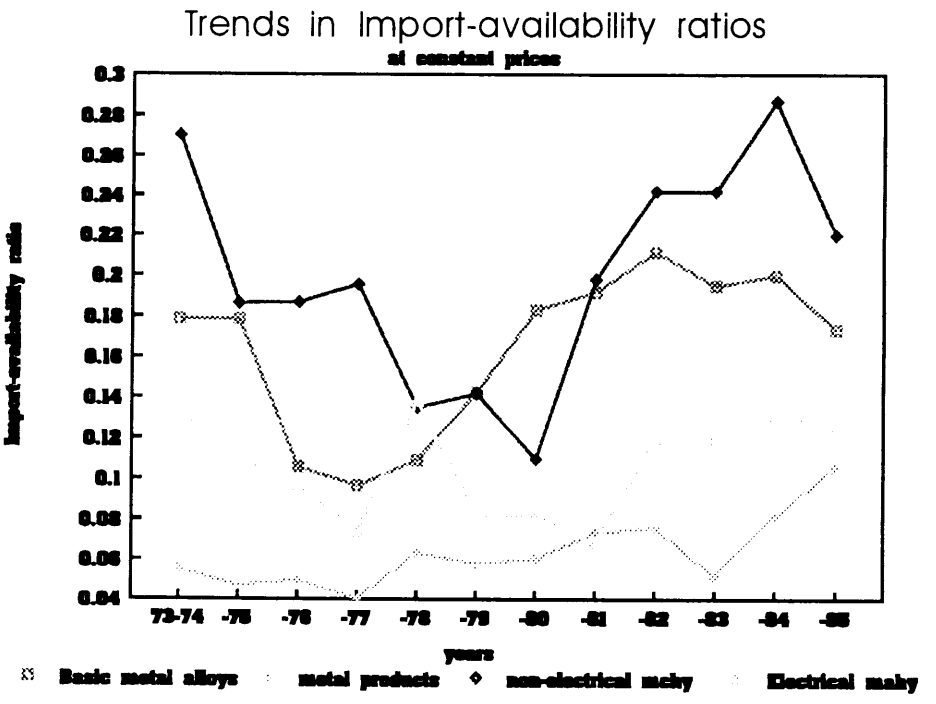
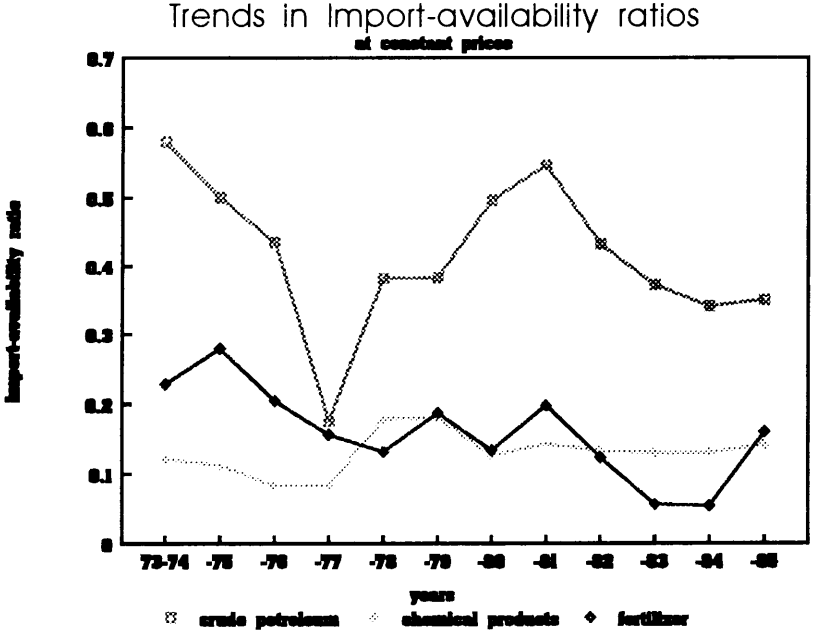

Trends in Import-availability ratios
at constant prices
Import-availability ratio
0.3
0.28
0.26
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
73-74
-75
-76
-77
-78
-79
-80
-81
-82
-83
-84
-85
years
Basic metal alloys
metal products
non-electrical machy
Electrical machy

CHART 3.2


Trends in Import-availability ratios
at constant prices
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
73-74
-75
-76
-77
-78
-79
-80
-81
-82
-83
-84
-85
years
crude petroleum
chemical products
fertilizer

from 1973-74 to 1974-75 and in 1979-80 to 1981-82 when there was an oil price hike. Later, there was a decline. The level of the wholesale price index of petroleum crude is lower than that of the unit value import index. After the second oil-price hike in 1979-80, the unit price of import rose faster than

Table 3.26

Trends in the Unit Value Index of Imports

Years	Petroleum crude	Chemical & chemical products	Ferti-lizer	Basic alloy metals	Manufac-ture of metal	Machinery except electrical	Electrical machi-nery
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1973-74	331	125	144	121	97	136	86
1974-75	729	247	294	180	157	181	138
1975-76	821	314	405	210	158	255	177
1976-77	916	205	203	190	190	280	184
1977-78	946	200	204	194	252	332	80
1978-79	944	209	206	193	383	326	177
1979-80	1500	241	236	229	319	419	229
1980-81	2266	303	319	218	352	271	-
1981-82	2700	303	352	219	375	-	165
1982-83	2587	284	297	222	460	269	147
1983-84	2417	278	272	232	322	317	235
1984-85	2681	351	369	244	273	368	244

Source: ITJ, SA.

Table 3.27

Trends in the Wholesale Price Index

(Base 1970-71) = 100

Years	Petroleum crude	Chemical & chemical products	Ferti-lizer	Basic alloy metals	Manufac-ture of metal	Machinery except electrical	Electrical machi-nery
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1973-74	317.1	116.4	113.9	139.0	127.2	125.8	116.7
1974-75	686.5	168.8	203.0	172.6	169.2	155.2	158.1
1975-76	700.3	175.6	214.7	184.8	175.8	175.4	169.5
1976-77	740.3	171.4	186.5	190.1	181.6	176.0	162.4
1977-78	787.6	172.8	177.4	193.8	193.0	177.9	164.8
1978-79	802.9	177.2	175.2	211.2	201.4	189.2	172.9
1979-80	1384.0	198.7	167.2	251.9	234.8	218.8	199.8
1980-81	2041.8	241.3	242.7	272.1	260.6	246.0	208.8
1981-82	2130.7	260.2	273.6	317.1	285.6	275.0	221.1
1982-83	1984.8	269.2	277.7	354.6	305.5	291.2	230.3
1983-84	1739.5	281.6	267.5	381.0	324.7	311.6	239.6
1984-85	1739.2	292.1	262.5	443.0	338.5	324.5	253.2

Source : WPI.

that of the wholesale price index. In the case of chemical and chemical products, of which fertilizer is an important item, it is noticed that there are wide spread fluctuations in the unit value import index, but on the contrary, the rise in the wholesale price has increased steadily. In the case of wholesale price index of fertilizer, there has been a decline since 1983-84.

In the case of basic metal alloys, one notices a sharp increase in wholesale price index from 1977-78, whereas the rise in unit value of import index is not pronounced.

In metal manufactures, there are widespread fluctuations in unit value of import index and from 1976-77 to 1983-84, it is higher than that of the wholesale price index, after which there is a sharp decline.

In the case of non-electrical machinery, the wholesale price index is below that of unit value import index except for the years 1981-82 to 1983-84. There has been a steady increase in the case of wholesale price indices

whereas there are widespread fluctuations in the case of unit value import index.

In the case of electrical machinery too, there are widespread fluctuations and from 1980-81 to 1984-85 the unit value import index is below that of wholesale price index.

From the analysis of the domestic prices and import prices, it is noticed that there are substantial differences. It is evident that unit value of imports rose faster than the domestic wholesale prices. This could be attributed to the differential rates of inflation. In 1974, the world economy experienced high rates of inflation, whereas domestic prices in India experienced little increase. This was due to the result of good harvests and an improved performance in the agricultural sector. Moreover, the fear of inflation and balance of payments deficit too, led to a macro-economic squeeze since 1974. So the adoption of ISI at that time, as mentioned earlier, insulated the Indian economy from external shocks. The impact of opening up the economy and its effect on the manufacturing sector with reference to capacity utilisation forms a necessary sequel to our analysis.

3.6 Trends in Capacity Utilisation

In this section, the impact of the policy effects on capacity utilisation in domestic industries are hoped to be examined. Table 3.28 and 3.29 show capacity utilisation rates for the manufacturing sector, compiled from the data provided by the Centre for Monitoring the Indian Economy. The data are based on 630 industries upto 1980 and on 600 industries for 1985.

The purpose of the import substitution/liberalization policy was to bring about a structural adjustment process and whether this came about, would be examined with reference to capacity utilisation.

There are many factors that affect capacity utilisation, there could be both supply and demand constraints leading to under-utilisation of capacity. Depending on the extent of capacity utilisation and import availability ratio, industries are categorised in the following manner.

Category-1

In this category are industries in which there is a decline in import availability ratio resulting in an increase in capacity utilisation. Petroleum refinery and non-electrical machinery products come under this category; these industries were subject to intensive import substitution and their

capacity utilisation was high. There was a slight decline in capacity utilisation of petroleum refinery products in 1976 and 1980 which could be attributed to the effects of oil price increase. In the case of non-electrical machinery, there is a steady increase in capacity utilisation from 1976 till 1980. It was the highest in 1984 (87 per cent), when modifications to the existing liberalisation policies came into being.

Table 3.28

Trends in the Rate of Capacity Utilisation for Selected Industries from 1970-85

S.No.	Industry group	1970	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1.	Petroleum refinery product	93	83	77	82	86	83	72	87	82	85	87	84
2.	Chemicals & chemical produ.	84	76	82	81	85	84	74	75	76	76	78	77
3.	Ferrous metals	59	56	62	61	62	56	52	63	63	60	61	61
4.	Metal products	82	59	58	58	66	75	74	72	74	68	72	90
5.	Non-electrical machinery	76	77	68	70	77	79	86	85	82	82	87	83
6.	Electrical machinery	110	56	58	61	62	67	66	67	65	60	64	68
7.	Manufacturing sector	85	73	73	72	75	75	73	75	74	75	78	77

Source: CMIE, Oct. 1986, For 1985 Capacity utilisation figures from October, 1986 issue.
(i) Production and capacity utilisation in 630 industries October, 1985.
(ii) Production and capacity utilisation in 600 industries October, 1986.

Category-2

In this category are industries, where there is an increase in import availability ratio accompanied by a decline in the rate of capacity utilisation; this could imply deficiency in demand. This is because the imported commodities which are close substitutes of domestically produced commodities capture the market, resulting in under-utilisation of the existing capacity. This could result in unemployment and ultimately to a deficiency in demand. This could have occurred in the non-electrical machinery for the years 1979-1980, and in electrical machinery for 1981 and 1982 as there is a slight decline in capacity utilisation. This finding is in conformity with studies on capital goods sector.

Table 3.29

Rate of Capacity Utilisation

S. No	ASI code	Industry group	Weights	1970	1975	1980	1985
1.	20-21	Food products	7.74	97	82	81	90
2.	22	Beverages, tobacco and Tobacco products	2.90	105	78	100	99
3.	23-26	Textiles	4.96	75	77	78	66
4.	27	Wood & wood products					
5.	28	Paper & paper products	2.04	98	64	35	49
6.	29	Leather & leather products					
7.	30	(i) Rubber	2.09	95	74	80	73
		(ii) Petroleum	1.62	93	83	72	84
8.	31	Chemicals	10.26	84	76	74	77
9.	32	Non-metallic minerals	3.30	84	72	79	77
10.	33	Ferrous metal	5.36	59	54	52	61
11.	34	Metal products	2.74	82	59	74	90
12.	35	Non-electrical machinery	4.59	76	77	86	83
13.	36	Electrical machinery	5.23	110	56	66	68
14.	37	Transport	5.24	82	95	58	77
15.	38	Miscellaneous	1.70	109	65	95	66
		Manufacturing sector	72.01	85	73	73	77

Category-3

In this category are industries whose import availability ratio is positively associated with capacity utilisation rate. Chemical and metal products fall in this category. It could imply that domestic capacity was not sufficient to meet the increase in demand requirements, despite increase in capacity utilisation and so imports had to be resorted to.

An increase in import availability ratio and capacity utilisation rates could also imply that the supply side constraints in the form of raw material shortages or other critical inputs have been removed, resulting in improved

capacity utilisation. Industries in this group experience favourable effect due to liberalization policies.

Category-4

This category consists of industries whose import availability ratio and capacity utilisation rate have both declined. This implies that there are other factors affecting the industry and thus they are neutral to liberalisation policies. For the year 1981-82, metal and alloy industries experienced such a situation.

In the analysis of import availability ratio and capacity utilisation rate, it is noticed that there are positive as well as negative factors in the liberalization strategy. In industries where there are shortages or supply side constraints, liberalization has helped in overcoming these constraints by liberal imports. But in some industries liberalisation measures have led to undue competition resulting in under-utilisation of capacity.

CHAPTER 4

ESTIMATES OF IMPORT SUBSTITUTION FOR THE MANUFACTURING SECTOR (1969-70 TO 1984-85)

A major objective of this study is to estimate the extent of import substitution in the manufacturing sector for the period 1969-70 to 1984-85. In this chapter, an attempt has been made to estimate it. The notable studies that have evaluated the performance and changing structure of the industrial sector in India in relation to imports have been by Desai (1970), Bokil et al (1981), Ahluwalia (1985) and Sastry (1988).

Most of the studies mentioned earlier have used the relative measure, Chenery measure or variants of the Chenery measure; the exception being Nambiar who has used the Fifth Plan input-output model to estimate direct and indirect import requirements. However, inconsistency arises, when the sectoral measures are applied to the global level. In order to rectify the shortcomings in estimating import substitution, a modified version has been adopted.[1]

To estimate the extent of import substitution for the manufacturing sector for 1969-70 to 1984-85, we have used four bench-mark years, namely, 1969-70, 1974-75, 1979-80 and 1984-85. The relative and Chenery measures have been adopted to estimate import substitution for these years. The relative measure computes the difference between the ratios of import availability during different periods of time, as a proportion with reference to the base year import availability ratio. In the Chenery measure, import substitution is the difference between growth in output with no change in import ratio and the actual growth.[2] A modified version of the existing measure to capture the direct and indirect requirements of imports has been applied for the year 1973-74 to 1979-80. From these estimates of import requirements, import substitution has been computed for individual industries as well as for the manufacturing sector as a whole. The estimates used in current and constant

1. *See Section 2.3, Chapter 2.*
2. *Refer Chapter 2 for details.*

prices have been presented, but our analysis is based on constant prices.[3]

4.1 Relative measure of import substitution

Table 4.1 and 4.2 provide estimates of IS based on relative measure at current and constant prices.

Import substitution during 1969-70 to 1974-75 occurred in fewer industry groups, the highest being in paper and paper products (34 per cent) and the lowest in electrical machinery (11 per cent). Import dependence occurred in 8 industry groups. Import dependence occurred in rubber, petroleum and coal products (12 per cent). Food products, beverages, tobacco and tobacco products experienced decline in both production and imports. This could be attributed to a decline in demand.

In the year 1979-80, as compared to 1974-75, import substitution occurred in 7 industries. IS in machinery and machine tools was as high as 43 per cent. The effect of the oil price hike in 1973 led to the change in scenario in rubber, petroleum and coal products industry. The shift from import dependence to import substitution is marked. In the year 1984-85, as compared to 1979-80, import substitution occurred in only 3 industries, namely, rubber, petroleum and coal products, basic metal and alloy industries and transport equipment. Import substitution had considerably reduced in 1984-85, this could be due to the liberalization policy that had come to occupy the centre stage of India's industrialization strategy.

During the decade 1969-70 to 1979-80, import substitution occurred in 8 industrial groups. In 3 groups, namely beverages, tobacco and tobacco products, leather and fur products and non-electrical machinery, the range of import substitution was between 60 to 75 per cent. In two industries it ranged between 40 to 50 per cent and in three industry groups it ranged from 10 to 25 per cent. During the 15 year period 1969-70 to 1984-85, import substitution occurred in 6 industries, the major industry groups being that of rubber, petroleum and coal products in which import substitution was estimated to be 63 per cent.

4.2 Chenery Measure of Import Substitution

Tables 4.3 and 4.4 show estimates of import substitution according to the Chenery measure. The relationship between the Chenery measure and the relative measure has already been noted.[4] A comparison of the estimates

3. *Refer Chapter 3, Section 3.7*
4. *See Chapter 2, footnote 2.*

Table 4.1

Import Substitution According to the Relative Measure

(at current prices)

Sl. No.	ASI code	Name of the industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1969-70 to 1979-80	1974-75 to 1984-85	1969-70 to 1984-85
1.	20-21	Food products	-0.0571	-0.0942	0.6089	-0.1404	0.4574	0.3830
2.	22	Beverages, tobacco & tobacco	—	-0.6923	1.0000	-0.6923	-0.3846	-0.3846
3.	23-26	Textiles	-0.2400	0.7544	0.8100	0.3333	2.1754	1.4133
4.	27	Wood & wood products, furniture and fixtures	2.1364	1.0145	-0.1799	5.3182	0.6522	4.1818
5.	28	Paper & paper products, printing publishing & allied industries	-0.1577	0.5251	-0.0514	0.2845	0.4468	0.2186
6.	29	Leather, leather & fur products	0.1429	-0.6250	37.6667	-0.5714	13.5000	15.5714
7.	30	petroleum & coal products	1.0338	0.0606	-0.4163	1.1571	-0.3809	0.2591
8.	31	Chemicals & chemicals products (except products of petroleum and coal)	0.0572	-0.0522	0.1121	0.0020	0.0541	0.1143
9.	32	Non-metallic mineral products	0.2900	3.8372	-0.6667	5.2400	0.6124	1.08
10.	33	Basic metal and alloy industries	0.5674	-0.0839	-0.3881	0.4356	-0.4394	-0.1213

Table 4.1 (Contd.)

Sl. No.	ASI code	Name of the industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1969-70 to 1979-80	1974-75 to 1984-85	1969-70 to 1984-85
11.	34	Metal products & parts except machinery	0.7098	0.8417	0.0847	2.1490	0.9977	2.4157
12.	35	machine tools & parts except electrical machinery	-0.3400	-0.1186	0.3036	-0.4183	0.1490	-0.2417
13.	36	Electrical machinery, apparatus, appliances and supplies and parts	-0.1019	-0.2076	0.3935	-0.2883	0.1043	-0.0083
14.	37	Transport equipment & parts	0.1931	-0.3780	-0.4491	0.5562	-0.2814	-0.1427
15.	38	Other manufacturing industries	0.8344	0.6865	0.1417	2.0937	0.9254	2.4319
			0.4377	0.1630	-0.1278	0.7086	0.0366	0.4903

Source :ASI, MSFTI, WPI, ITJ

Table 4.2

Relative Measure of Import Substitution at Constant Prices

Sl. No.	ASI code	Name of the industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1969-70 to 1979-80	1974-75 to 1984-85	1969-70 to 1984-85
1.	20-21	Food products	-0.1651	-0.3736	1.5965	-0.4771	0.6264	0.3578
2.	22	Beverages, tobacco & tobacco	-0.1538	-0.6364	2.2500	-0.6926	-0.5455	-0.6154
3.	23-26	Textiles	-0.2464	1.0577	0.5888	0.5507	2.2692	1.4638
4.	27	Wood & wood products, furniture and fixtures	1.5000	3.6000	0.2522	10.5000	4.7600	13.4000
5.	28	Paper & paper products, printing publishing & allied industries	-0.3417	0.7271	0.0034	0.1369	0.7330	0.1408
6.	29	Leather, leather & fur products	0.2857	-0.7778	0.0145	-0.7143	31.4444	
7.	30	Rubber, petroleum & coal products	0.1172	-0.1952	-0.5939	-0.1008	-0.6731	-0.6348
8.	31	Chemicals & chemicals products (except products of petroleum and coal)	-0.2158	0.1168	0.1236	-0.1242	0.2549	-0.0160
9.	32	Non-metallic mineral products	0.4673	0.7070	0.3769	1.5047	1.3503	2.4486
10.	33	Basic metal and alloy industries	0.4983	0.0429	-0.0732	0.5626	-0.0334	0.4482

Table 4.2 Contd.

Sl. No.	ASI code	Name of the industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1969-70 to 1979-80	1974-75 to 1984-85	1969-70 to 1984-85
11.	34	Metal products & parts except machinery	1.0437	0.2885	0.7546	1.6332	1.2607	3.6201
12.	35	Machinery, machine tools & parts except electrical machinery	-0.3228	-0.4283	1.0648	-0.6129	0.1804	-0.2007
13.	36	Electrical machinery, apparatus, appliances and supplies and parts	-0.1082	-0.3819	0.6340	-0.4487	0.0100	-0.0993
14.	37	Transport equipment & parts	0.2520	-0.3948	-0.4540	-0.6007	-0.4314	-0.1260
15.	38	Other manufacturing industries	0.4512	0.0977	0.2014	0.5940	0.3188	0.9150
		Total (a)	0.0660	-0.0332	0.1840	0.0637	0.1840	0.2594
		(b)	0.1441	-0.0147	0.1208	0.1525		0.2917

Source: ISI, MSFTI, WPI, ITJ.

Table 4.3

Import Substitution According to the Chenery Measure

(at current prices)

Sl. No.	ASI code	Name of the industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1969-70 to 1979-80	1974-75 to 1984-85	1969-70 to 1984-85
1.	20-21	Food products	0.0029	0.0052	-0.0277	0.0051	-0.0155	-0.0113
2.	22	Beverages, tobacco & tobacco	-0.0002	0.0022	-0.0006	0.0013	0.0008	0.0006
3.	23-26	Textiles	0.0039	-0.0110	-0.0236	-0.0039	-0.0208	-0.0138
4.	27	Wood & wood products, furniture and fixtures	-0.0089	-0.0167	0.0006	-0.0162	-0.0069	-0.0111
5.	28	Paper & paper products, printing publishing & allied industries	0.0299	-0.1224	0.0137	-0.0431	-0.0576	-0.0275
6.	29	Leather, leather & fur products	-0.0002	0.0008	-0.0414	0.0005	-0.0142	-0.0124
7.	30	Rubber, plastic, petroleum and coal products	-0.5286	-0.0720	0.4100	-0.4731	0.2488	-0.0737
8.	31	Chemicals & chemicals products (except products of petroleum and coal)	-0.0145	0.0181	-0.0383	-0.0567	-0.0132	-0.0746
9.	32	Non-metallic mineral products	-0.0064	-0.1044	0.0670	-0.0759	-0.0090	-0.0123
10.	33	Basic metal and alloy industries	-0.1480	0.0336	0.1360	-0.0772	0.1139	0.0175

Table 4.3 (Contd.)

Sl. No.	ASI code	Name of the industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1969-70 to 1979-80	1974-75 to 1984-85	1969-70 to 1984-85
11.	34	Metal products & parts except machinery	-0.0404	-0.0822	-0.0192	-0.0820	-0.0695	-0.0809
12.	35	machine tools & parts except electrical machinery	0.2295	0.0614	-0.1488	0.2052	-0.0554	0.1131
13.	36	Electrical machinery, apparatus, appliances and supplies and parts	0.0197	0.0412	-0.0738	0.0413	-0.0152	0.0011
14.	37	Transport equipment & parts	-0.0287	0.0647	0.0985	-0.0584	0.0324	0.0119
15.	38	Other manufacturing industries	-	-0.9952	-0.5213	-1.9369	-1.2293	-1.9445
		All Industries	-0.0818	-0.0488	0.0442	-0.0900	-0.0071	-0.0560

Table 4.4

Chenery Measure of Import Substitution at Constant Prices

Sl. No.	ASI code	Name of the industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1969-70 to 1979-80	1974-75 to 1984-85	1969-70 to 1984-85
1.	20-21	Food products	-0.0325	0.0214	-0.1077	0.0429	-0.0266	-0.0213
2.	22	Beverages, tobacco & tobacco	-0.0145	0.0030	-0.0030	0.0040	0.0012	0.0018
3.	23-26	Textiles	0.0436	-0.0238	-0.0639	-0.0146	-0.0388	-0.0304
4.	27	Wood & wood products, furniture and fixtures	-0.0130	-0.0925	—	-0.0558	-0.1243	-0.0720
5.	28	Paper & paper products, printing Publishing & allied industries	0.2276	-0.2425	-0.0016	-0.0446	-0.1258	-0.0305
6.	29	Leather, leather & fur products	-0.0013	0.0018	0.2262	0.0010	-0.0612	-0.0524
7.	30	Rubber, plastic, petroleum & coal products	-0.2252	0.2205	0.3193	0.7020	0.3168	0.2380
8.	31	Chemicals & chemicals products (except products of petroleum and coal)	0.0780	-0.0339	-0.0616	0.0295	-0.0550	0.0034

Table 4.4 (Contd.)

Sl. No.	ASI code	Name of the industry group	1969-70 to 1974-75	1974-75 to 1979-80	1979-80 to 1984-85	1969-70 to 1979-80	1974-75 to 1984-85	1969-70 to 1984-85
9.	32	Non-metallic mineral products	-0.0658	-0.0467	0.0285	-0.0547	-0.0422	-0.0617
10.	33	Basic metal and alloy industries	-0.4639	-0.0280	0.0789	-0.1877	0.0153	-0.1162
11.	34	Metal products & parts except machinery	—	-0.0504	-0.4173	-0.1509	-0.1771	-0.2623
12.	35	Machinery, machine tools & parts except electrical machinery	0.3546	0.3038	-0.5601	0.3691	-0.0903	0.1109
13.	36	Electrical machinery, apparatus, Appliances and supplies and parts	-0.0431	0.1097	-0.1518	0.0965	-0.0021	0.0187
14.	37	Transport equipment & parts	-0.0785	0.1123	0.0089	0.0357	0.0471	0.0296
15.	38	Other manufacturing industries	—	-0.1226	-0.3944	—	-0.3241	-1.2726
		Total (a)	-0.0423	0.0104	-0.0864	-0.0064	-0.0372	-0.0423
		(b)	-0.0920	0.0042	-0.0680	-0.0254	-0.0272	-0.0462

Note: ** Both the numerator and denominator are negative.

Source: ASI, MSFTI, WPI, ITJ.

of these two measures, shows the same results, i.e. the industries which experienced import substitution/import dependence by the use of relative measure showed import substitution/import dependence by the Chenery measure too, the variation between the two measures has been in the extent of import substitution. In the Chenery measure, the estimates of import substitution are much lesser than that obtained by using the relative measure.

Examining the Table 4.4, we notice that import dependence in the periods 1969-70 to 1979-80 and 1969-70 to 1984-85 and in the sub-periods are visible in non-metallic mineral products, metal products except machinery and other manufacturing industries. Import dependence in the case of rubber, petroleum and coal products and transport equipment occurred in 1969-70 to 1974-75, but later for the decade 1969-70 to 1979-80 and the 15 year period and the sub-periods there was an increase in import substitution.

In the case of electrical and non-electrical machinery, import dependence occurred in 1979-80 to 1984-85. But in other periods and sub-periods there was import substitution.

Tables 4.5 and 4.6 depict the estimates of import substitution based on the use-based and input-based industry groups, according to the relative and Chenery measure. They are based on current prices. In consumer durables import dependence is noticeable in all the sub-periods except for the year 1969-70 to 1974-75, when there was IS, whereas in the case of non-durables, import substitution has occurred during 1969-70 to 1974-75 and during the decade 1969-70 to 1979-80 and during 1969-70 to 1984-85. This would imply that we have obtained a certain amount of self-sufficiency in this group of industries. In the case of capital goods, import substitution occurred during the decade 1969-70 to 1979-80 (6 per cent) and import dependence during the decade 1974-75 to 1984-85. Import substitution has occurred in basic (7 per cent) and intermediate goods industries (5 per cent).

From the estimates of import substitution based on input-based classication, we notice that import substitution occurred in agro-based industries for the sub-period 1969-70 to 1974-75, but for the later periods and sub-periods there is import dependence. In the chemical-based industries, import substitution has occurred during the decade 1974-75 to 1984-85 (8 per cent) and the sub-period 1979-80 to 1984-85 (16 per cent). Major contribution to IS in this group is from that of rubber, petroleum and coal products.

4.3 Estimation of Import Substitution using the input-output framework (1973-74 - 1979-80)

In estimating the extent of import substitution for the manufacturing

Table 4.5

Estimates of Import Substitution According to the Relative Measure Use-Based and Input-Based Classification

		1974-75 over 1969-70	1979-80 over 1974-75	1984-85 over 1979-80	1979-80 over 1969-70	1984-85 over 1974-75	1985-85 over 1969-70
A.	**Use-Based Classification**						
1.	Basic goods	0.5707	-0.0933	-0.1683	0.4242	-0.2458	0.1846
2.	Intermediate goods	2.4817	0.2639	-0.3309	3.4006	-0.1543	1.9444
3.	Capital goods	-0.1598	-0.0601	0.1420	-0.2103	0.0734	-0.0982
4.	Consumer goods						
	(a) Durables	-0.2384	0.8917	0.1767	0.4406	1.2259	0.6952
	(b) Non-durables	-0.3656	0.0265	0.4903	-0.3487	0.5298	-0.0294
	TOTAL	0.4377	0.1630	-0.1278	0.7086	0.0366	0.4903
B.	**Input-based Classification**						
1.	Agro-based	-0.0633	0.2518	0.4262	0.1726	0.7530	0.6724
2.	Chemical-based	0.5148	0.0801	-0.2615	0.6361	-0.2024	0.2082
3.	Metal-based	0.0372	0.0601	-0.0376	0.0995	0.0202	0.0582

Source: ASI, MSFTI.

Table 4.6

Estimates of Import Substitution According to the Chenery Measure Use-Based and Input-Based Classification

		1974-75 over 1969-70	1979-80 over 1974-75	1984-85 over 1979-80	1979-80 over 1969-70	1984-85 over 1974-75	1985-85 over 1969-70
A	**Use-based Classification**						
1.	Basic goods	-0.1512	0.0379	0.0590	-0.0758	0.0663	-0.0279
2.	Intermediate goods	-0.6177	-0.1495	0.2205	-0.4318	0.0538	-0.1775
3.	Capital goods	0.0652	0.0204	-0.0489	0.0572	-0.0174	0.0237
4.	Consumer goods						
	(a) Durables	0.0865	-0.3675	-0.1475	-0.1482	-0.3656	-0.2273
	(b) Non-durables	0.0139	-0.0009	-0.0179	0.0107	-0.0122	0.0008
	TOTAL	-0.0818	-0.0488	0.0442	-0.0900	-0.0073	-0.0560
B.	**Input-based Classification**						
1.	Agro-based	0.0029	-0.0119	-0.0249	-0.0053	-0.0235	-0.0714
2.	Chemical-based	-0.1665	-0.0497	0.1623	-0.1682	0.0796	-0.0461
3.	Metal-based	-0.0119	-0.0208	0.0140	-0.0224	-0.0048	-0.0114

Source: ASI, MSFTI.

sector for the years 1979-80 as compared to 1973-74, we take into account the change in the structure of final demand. We attribute the change in imports to (a) growth in final demand (b) change in composition of final demand (c) import substitution.

In estimating import substitution, we assume the technology matrix to remain the same for both the years namely, the base year 1973-74 and the terminal year 1979-80. We consider only the changes in import co-efficients and final demand. The direct and indirect requirements of imports for 1979-80, based on its import co-efficients and final demand is denoted as $i\,M^1[(1-A)^\circ + M^1]^{-1}\,F^1$. The direct and indirect requirements of imports for 1973-74, based on its import co-efficient and final demand is denoted as $i\,M^\circ[(1-A)^\circ + M^\circ]^{-1}\,F^{\circ 5}$. The import requirements are shown in the following table:

Table 4.7

Direct and Indirect Requirements of Imports

(Rs. Million at 1971-72 Prices)

Imports required for fulfilling final demand in 1973-74	23,409.7
Imports required for fulfilling final demand in 1979-80	16,830.0
Change in import requirements	(-)6579.7

From Table 4.7, we notice that for the Indian economy there has been a decline in import requirements in 1979-80 as compared to 1973-74 in real terms. To determine the cause for the decline in imports, the import requirements to meet per unit of final demand at a disaggregated level presented in Table 4.8. The dependency in imports in 1979-80 has declined substantially as compared to 1973-74. In 9 sectors, we notice the decline due to the effect of import substitution. In order to verify whether the extent of import substitution (-10523.4) has been over-estimated, a comparison with the R.B.I. data was made[6]. At constant prices (1971-72 = 100), there was

5. *For further details ref. Chapter 2; and Tables A.4(a), A.4(b) and A.4(c).*
6. *Refer Appendix A.4.2.*

Table 4.8

Effect of Import Substitution in the Manufacturing Sector at 71-72 Prices (1973-74 to 1979-80)

Sl. No.	Sector	Direct and indirect requirement of imports for per unit final demand				Effect of import-substitution 1979-80 over 1973-74
		1973-74	Rank	1979-80	Rank	
1.	Agriculture and service	0.0293	14	0.0199	15	-0.0094
2.	Food products	0.0384	12	0.0425	10	0.0041
3.	Textiles	0.0333	13	0.0235	13	-0.0098
4.	Wood & wood products	0.0177	15	0.0129	14	0.0048
5.	Paper & paper products	0.2832	2	0.1751	4	-0.1081
6.	Leather & leather products	0.0702	10	0.0415	11	-0.0287
7.	Rubber plastic petroleum and coal products	0.2266	5	0.1127	7	-0.1139
8.	Chemical & chemical products	0.2729	3	0.1638	5	-0.1091

Table 4.8 (Contd.)

Sl. No.	Sector	Direct and indirect requirement of imports for per unit final demand				Effect of import-substitution 1979-80 over 1973-74
		1973-74	Rank	1979-80	Rank	
8.	Non-metallic mineral products	0.0598	11	0.0257	12	-0.0341
9.	Basic metal and alloy industries	0.2283	4	0.2794	1	0.0511
10.	Metal products and parts except machinery	0.0835	9	0.0961	8	0.0126
11.	Machinery, machine tools & parts except electrical machinery	0.7528	1	0.1774	3	-0.5754
12.	Electrical machinery	0.1262	6	0.1784	2	0.0522
13.	Transport equipment and parts	0.1066	7	0.1238	6	0.0172
14.	Miscellaneous industries	0.1001	8	0.0917	9	-0.0084

considerable difference between the data of the Planning Commission and that of the RBI In the group machinery and transport equipment, the difference substantial between the two sources of data. When we examine the import matrix of the Fifth Plan, we notice in the group machinery and machine tools, iron and steel is an important item of imports. And in RBI non-electrical machinery is a major item of import. Further break-up of this industry group is not available. In the case of mineral oil and lubricants, we notice that according to RBI there has been an increase, but the Planning Commission data reveals a decline. This could be due to the fact that crude oil is the major item in petroleum group, which gets included in crude materials, according to the RBI classification. The import price of this item was very high. The reason for the decline in imports in real terms could be due to the enormous increase in import price of petroleum products in 1979, the year of the second oil price hike (refer Table 3).

The break-up of changes in imports due to changes in final demand and due to import substitution are shown in Table 4.9. The changes in final demand consists of two components namely (i) growth in final demand and (ii) composition of final demand. The growth rate is estimated on the basis of growth of final demand in the current year, vis-a-vis, the base year keeping the composition of final demand constant. The estimates derived from

$$i\,M^1[(1-A)^0 + \hat{M}^1]^{-1} F_1 - i\,\hat{M}^0[(1-A)^0 + \hat{M}^0]^{-1} F^1$$

is attributed to import substitution; and that due to growth effect is

$$i\,M^o[(1+A)^o + \hat{M}^{-1}\,[\lambda F^o - F^o]$$

and due to composition of final demand is obtained from

$$i\,M^o[(1-A)^o + \hat{M}^o]^{-1}\,[F^1 - \lambda F^o]$$

The estimates so derived are given in the following table:

Table 4.9

Estimates of Import Substitution and Final Demand for the Manufacturing Sector

		(Rs. Million 1971-72 Prices)
Changes due to growth effect	=	1338.2
Changes due to composition effect	=	2605.5
Changes due to import substitution	=	(-) 10523.4
Change in final demand	=	3943.7

That import substitution strategy played a major role in reducing imports is evident from our estimates; machinery and machine tools, rubber, petroleum and coal products and chemicals were the important industries in which import substitution has taken place. That during the year 1979-80, IS was externally enforced, cannot be over-ruled.

4.4 Summary and Conclusions

In this study, comparable data of industrial imports and industrial production, which follow different classifications has been made. From this correspondence at the 3 digit level, emerged the correspondence at the two digit level for the manufacturing sector. From the 3 digit level classification an intermediate level, namely the use-based classification was computed. From the 2-digit level classification an intermediate level, namely the input-based classification was computed. The analysis at the two- digit level is at constant prices, whereas at the intermediate level, i.e. use-based classification is at current prices, estimates at constant prices for input-based classification has been given.

Within this board framework, we examined the extent of structural changes in industrial production and industrial imports for the period 1969-70 to 1984-85. We notice that dramatic changes have taken place during this period, the changes in structure were measured at both constant and current prices for industrial imports and industrial production. An increasing share in imports and production of intermediate goods and consumer durables in 1984-85 as compared to 1969-70 and a decline in the share of imports of consumer non-durables during the same period is evident. A plausible explanation is that, these changes could have been policy induced.

The analysis of the growth rates gave us a glimpse of whether there was import substitution or import dependence. The manufacturing sector recorded a moderate growth rate of 6 per cent for the period 1969-70 to 1984-85. The fast growing industries were rubber, petroleum and coal products; chemicals, non-electrical machinery, electrical machinery and transport equipment. A significant decline in their imports was noticed. At the intermediate level, which is based on current prices, for the period 1969-70 to 1984-85, there has been a high growth rate of imports of intermediate goods and consumer durables. In the input-based classification high growth rate of imports was witnessed in the chemical based industries. At constant prices, for chemical-based industries, the compound growth rate of production was 10 per cent, and that of imports was 8 per cent. This group of industries showed high growth rate in imports accompanied by high growth rate in production.

Our analysis of import availability ratios fall in line with the analysis

provided by the growth rates. The point to be highlighted is that when trends in some of the major industry groups were examined, substantial divergence in current and constant prices were noticed.

As a sequel to this exercise, the wholesale price indices and the unit value import indices were examined and since divergent trends were clearly visible, it was realised that analysis based on constant prices, would be meaningful. The reason for divergence between the domestic prices and import prices is due to differential rates of inflation. During the 70s, the world economy experienced high inflation rates, whereas in India the increase was moderate. This was due to improved performance of the agricultural sector.

To assess the impact of the changes in policy measures, namely, import substitution and liberalization, the capacity utilisation rates and the import-availability ratios were examined for some selected industry groups. Industries were classified on the basis of movements of import-availability ratio and capacity-utilisation rates into four categories. In the case of petroleum products, it was clearly observed that decline in import-availability ratio resulted in increased capacity utilisation. This industry experienced import substitution. In the case of machinery, machine tools and electrical machinery, it was observed that for some years there could have been supply constraints while in other years there could have been demand deficiency due to higher import-availability ratio. When import availability ratios for the year 1984-85, as compared to 1979-80, were examined and the machine tools industries experienced import dependence, but when we examine the trend in import availability ratios with reference to capacity utilisation years from 1979-80 to 1984-85 (refer Chart 3.3) we notice that this has not affected capacity utilisation adversely. This would imply that import substitution has occured and liberalisation has helped in importation of critical inputs. In the case of chemicals, positive effects of liberalization was experienced, as there was both an increase in import-availability ratio and an increase in capacity utilisation. Decline in import-availability ratio and capacity utilisation ratio meant that there were other factors affecting the industry and hence liberalization policies had no impact.

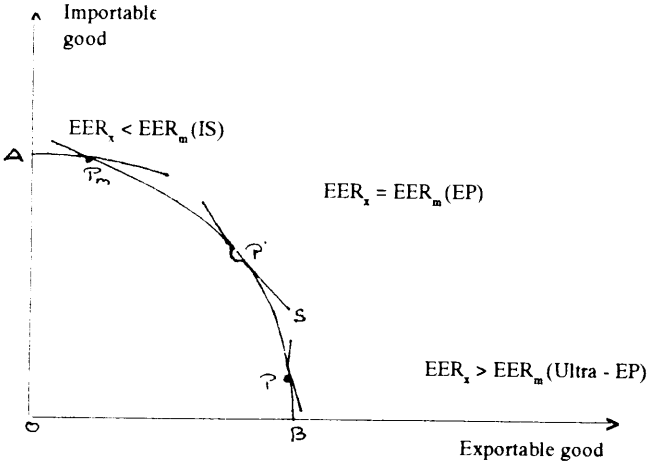
The focus of our study has been on the estimation of import substitution. We have used the Relative and Chenery measures to estimate import substitution. A modified measure using the input-output matrix has been used to estimate the extent of import substitution in the manufacturing sector, which is consistent with that of the individual industry groups.

Estimates of import substitutiton for the year 1984-85 as compared

to 1979-80 show that we are now moving into an era of import dependency. If critical inputs are imported that result in better performance of the industry, then the import dependency could be justified, but if it happens otherwise, this could result in deceleration of growth in industry.

Appendix I *

The definition of the neo-classicals could be illustrated by a two good model,



Assume AB to be the country's production possibility curve with increasing opportunity costs for the two commodities. The country could produce OA of cloth or OB of wheat. The country will specialise in the commodity in which she has a comparative advantage, say wheat. She will exchange some of her wheat output at the world terms of trade, given the international prices P* s, the equilibrium production would be reached at P*. If the exchange rate is such as to ensure that the relative goods price, domestically, is also equal P*s, then we have $ERP_x = EER_m$. Now, if tariffs are imposed, the incentives to produce the import competing good (say cloth) is greater than that of the exportable good. The protection afforded to the cloth industry will lead to an expansion of domestic output. The production shifts to P_m. the $EER_x < EER_m$. This is IS strategy (Bhagwati, 1988). The tendency of the IS strategy to overvalue the exchange rate, as suggested by the neo-classicals could be depicted as follows:

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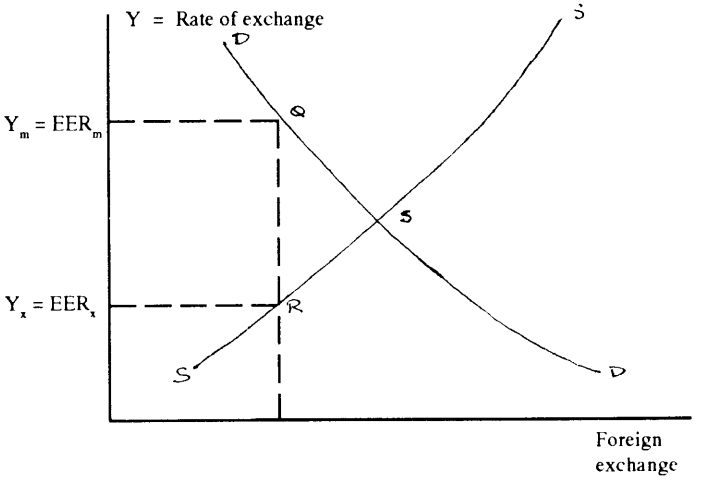
* *This is extracted from Bhagwati (1988)*



SS represents the supply curve of foreign exchange, DD the demand curve for foreign exchange. If the exchange rate is adjusted to clear the market at S, then $EER_x = EER_m$, because an identical parity applies to both export and import transactions. But if the exchange rate is overvalued by import tariffs and restrictions and exchange controls, then the overvalued exchange rate would be $Y_m = EER_m$, foreign exchange earned would be OW, corresponding to R on the SS and which would be rationed to the users, fetching a market determined price which exceeds Y_x. This price is determined by Q on the demand curve with Y_m corresponding to R on the supply curve. Since the demand exceeds the supply, the premium at which the scarce foreign exchange commands is $\frac{Y_m - Y_x}{Y_x}$. Over valued exchange rate thus Ys implies the pursuit of IS strategy according to the neo-classicals.

Table A.2.1

Correspondance between Industries and Trade Classification in India

Sl. No.	Name of sector	SIC (ASI before 1970)	NIC (ASI after 1970)	RITC (before 1970)	ITC-Rew (After 1977)
(1)	(2)	(3)	(4)	(5)	(6)
1.	Slaughtering, preparation & preserving of meat	201	200	011,012,013	011,012,014
2.	Manufacturing of dairy products	202	201	022,023,024	022,023,024
3.	Canning & preserving of fruits and vegetables	203	202	052,053 (ex 0.532) 055 (ex 055.4)	056(ex 056.4), 058,057
4.	Canning and preserving of fish and other sea foods	204	203	032	037

Table A.2.1 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)
5.	Manufacture of grain mill products	205	204	046,047,049, 048.1,048.2, 081.2,081.3, 055.4	042.2,046,047 048.1,056.4, 081.2,081.3
6.	Manufacture of bakery products	206	205	048.4,048.8	048.4,048.8, 056.4
7.	Sugar factories & refineries	207	206,207	061	061
8.	Manufacture of cocoa, chocolate & sugar confectionery	208	209	062.072,073	062,072,073
9.	Manufacture of miscellaneous food preparation	209	208,210,211, 212,213,214, 215,217,219.	09,048.3,081.4 081.9,048.8(3), 071 (ex.071.1A), 074,075,051.7	09,048.3(ex.048 (3),071(ex.071.A 074,075,057.7
10.	Distilling, rectifying and blending of spirits	211	220	112.4	112.4

Table A.2.1 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)
11.	Wine industries	212	221	112(ex.112.4 & 112.3)	112(ex.112.4 & 112.3)
12.	Breweries & manufacturing of malt	213	222	112.3 & 048.2	112.3 & 048.2
13.	Soft drinks & carbonated water industries	214	223,224	111	111
14.	Tobacco manufactures	220	225,226,227, 228,229	122,121.0B	122
15.	Spinning, weaving & finishing of textiles	231	231,232,234, 235,236,239, 240,241,242, 243,244,245, 246,249,250, 251,252,259, 262,263.	261.3,262.2,262.3, 262.5,262.7,262.8, 262.9,263.2,263.4, 267,651,652,653, (ex.653.7),654, 655.5,655.9,656.6, 656.9,265,659.	261.3,268.2,268.3, 268.5,268.7,268.9, 651.21,263.2,263.4, 269,651,653,654, 265,652,655,656, 657, (ex.657.6012), 658,659.

Table A.2.1 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)
16.	Knitting mills	232	260	653.7,841.4(1), 658.3,658.6,	
17.	Cordage, rope & twine industries	233	264,261	655.6	
18.	Manufacture of textiles n.e.c.	230,233, 253,267, 268,269.	261.2,262.6,263.3, 264,655.1,655.4, 655.8,656.1,656.2, 657,658.2,658.4, 658.5		
19.	Manufacture of wearing apparel except footwear	243	265,266	655.7,841.1,841.2, 841.3,841.5,842.0, 899.4.	657,6012,842,843 844,846,848 (ex.848.21),899.4,847.
20.	Saw mills, plaining & other wood mills	251	270,271	243,631	247,634
21.	Wooden & cane containers & cane small ware	252	272	632.1,632.2	635.1,635.2

Table A.2.1 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)
22.	Manufacture of cork & wood products - n.e.c.	259	273,275,279	632(ex.632.1, 632.2),633,244.	244,635.9,633.
23.	Manufacture of furniture & fixtures	260	274,276,277	821.1,821.0909	821.1(ex.821.1102) 821.92
24.	Manufacture of paper & paper products (board) and pulp	271	280,281,282, 283,287.	641,642(ex.642.3) 251	641,251,642 (ex.642.3)
25.	Printing, publishing & allied industries	280	284,285,286, 288,289.	892,642.3	892,642.3
26.	Tanneries & leather finishing plants	291		611,211.8A	611,211.9
27.	Manufacture of leather products except footwear & other wearing apparel	293	292,293,295 299	612,613,211.8B, 831.OA	612,613,831.0101, 831.0201,831.0901.
28.	Manufacture of rubber products	300	300,301,302.	621,629,841.6, 231.3,231.4	621,625,628,848.2, (ex.848.21),233.1, 233.2.

Table A.2.1 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)
29.	Petroleum refineries	321	304	332(ex.332.9, 332.1A),521.4, 331.0.	333,334,335 (ex.335.2)
30.	Manufacture of miscellaneous products of petroleum & coal	329	305,306,307	321.5,321.6B, 321.7B,321.8C, 332.9,521.1, 521.3,341 (ex.341.1A)	323,341,335.2
31.	Basic industrial chemicals including fertilizers	311	247,248,303 310,311,316 318.	512,513,514, 515,266,571, 581,431.3, 231.2,561.	511,512,513,514, 515,516,522, 323.21,287.32, 523,572,582,583, 584,585,562, 233.1,266,267.1,
32.	Vegetable and animal oil & fats (except edible oils)	312	315	421,422,431.1, 431.2,221.9, 411.3.	423,424,431.1, 431.2,431.3,411.3.

Table A.2.1 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)
33.	Manufacture of paints, varnishes and lacquer	313	312	532,533 (ex.533.2),534.	532,533(ex.533.2) 531.
34.	Manufacture of miscellaneous chemical products	319	313,314,317 319	541,551,553, 554,599,533.2, 899.3,431.4.	541,551,553,554, 59,533.2,899.3, 431.4.
35.	Manufacture of structural clay products	331	320	662,812.2	662,812.2
36.	Manufacture of glass and glass products	332	321	664,665.	664,665,812.4.
37.	Manufacture of pottery, china & earthern ware	333	322,323,327.	666,663.9.	666,663.9.
38.	Manufacture of cement (hydraulic)	334	324	661.2	661.2
39.	Manufacture of non-metallic mineral products - n.e.c.	339	325,326,328 329	661(ex.661.2), 663(ex.663.9)	661(ex.661.2), 663(ex.663.9).

Table A.2.1 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)
40.	Iron & steel basic industries	341	330,331,332.	276.6,282,321.8A, 321.8B,671,672, 673,674,675, 676,677,678,679.	278.6,282,323. 671,672,673, 674,675,676, 677,678,679.
41.	Non-ferrous metal industries	342	333,334,335, 336,339.	68	68
42.	Manufacture of metal products except machinery and transport equipment	350	340,341,343, 345,349,342.	69,284,812.1, 812.3,812.4, 894.3.	69,288,812.1, 812.2,812.4, 894.6.
43.	Manufacture of machinery except electrical machinery	360	350,351,352, 353,354,355, 356,357,358, 359.	711,712,714, 715,717,718, 719.	711,712,713,714, 718,722,723,724, 775.12,727,736, 737(ex.737.32), 74,697.81,697.35, 728.1,775.3, 791.91,728.4,75, 775.2102,775.220

Table A.2.1 (Contd.)

(1 (2))		(3)	(4)	(5)	(6)
44.	Manufacture of electrical machinery apparatus, appliances and supplies	370	360,361,362 363,364,365, 366,367,369.	72	737.32,741.31, 741.4902,716, 761,762,764, 771,772,773, 774,775.2 (ex.775.2102, ex.775.2202), 775.4,775.7, 775.8,776,778.
45.	Ship building & repairing	381	370	735	793
46.	Manufacture of railroad equipment	382	371,372,373.	731	791(ex.791.9).
47.	Manufacture of motor vehicles	383	374	732	781,782,783, 784.
48.	Manufacture of motor cycles & bicycles	385	375,376.	733(ex.733.3C)	785(ex.785.31(B) & 785.39(B)).

Table A.2.1 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)
49.	Manufacture of air craft	386	377	734	792
50.	Manufacture of transport equipment - n.e.c.	389	378,379.	733.3C,894.1	786.8,786.11, 786.12,785.31B, 785.39B.
51.	Manufacture of professional and scientific measuring and controlling instruments	391	380	861	87
52.	Manufacture of photographic and optical goods	392	381	862,863.	881,882,883, 884.
53.	Manufacture of watches & clocks	393	382	864	885
54.	Manufacture of jewellery and related articles	394	383,384.	897,275.1B, 275.2,667 (ex667.1A,867.2A 667.3A)	897,277.1,277.2, 667(ex.667.1001, ex 667.2, ex 667.31 ex.667.33, ex 667.900

Table A.2.1 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)
55.	Manufacture of musical instruments	395	386	891	898,763,764.9, 762.8.
56.	Manufacture of industries n.e.c.	399	385,387,389.	893,894(ex.894.3) 895.2,895.9,899 (ex.899.3 & 899.4), 896, 831.OB,895.1, 821.0.	893,848.21,894 (ex.894.63),895.2, 899(ex.899.3 & 899.4) 951.09,896, 895.1,821.0.

Notes:

1. The A & B refer to those commodities in the 'Classification of Commodities by Industrial Origin' published by United Nations.
2. Bracket (ex.) for the exclusion of specific item.
3. SIC - Standard Industrial Classification.
4. NIC - National Industrial Classification.
5. RITC - Revised Indian Trade Classification.
6. ITC-REV2 - Indian Trade Classification Revision-2.
7. ASI - Annual Survey of Industries.

Table A.2.2

Correspondence between Industrial and Trade Classification in India According to use Based Classification

Use-based classification	NIC (ASI before 1970)	SIC (ASI after 1970)	RITC (Before 1977)	ITC-REV-2 (After 1977)
Basic goods	311, 312, 334, 341, 342	310, 311, 316, 318 319, 324, 328, 33	221.9, 231.2, 411.3, 421, 422, 431.1, 431.2, 431.3, 512, 513, 514, 534, 561, 571, 581, 661, 67, 68	411.3, 423, 424, 431.1, 431.2, 431.3, 511, 512, 513, 514, 515, 516, 522, 523, 531, 562, 572, 582, 583, 584, 585, 59, 661, 67, 68
Intermediate goods	233, 251, 252, 259, 271, 291, 292, 300, 313, 321, 329, 331, 339, 350	230, 233, 240, 244, 25, 261, 267, 268, 269, 270, 271, 272, 273, 274, 275, 279, 280, 281, 283, 287, 290, 294, 300, 302, 303, 304, 305, 306, 307, 312, 315, 320, 325, 326, 328, 329, 340, 341, 343, 344, 349, 362, 364.	211.8A, 211.8B, 243, 244, 261.3, 262.2, 262.3, 262.5, 262.7, 262.8, 262.9, 264, 265 266, 267, 276.6, 282, 284, 321-A & B, 431.4, 532, 533, 611, 612, 613, 641, 642, 651 653, 654, 655.1, 656.2, 657, 659, 662, 663, 69, 812.4.	211.9, 233.1, 244, 247, 251, 261.3 264, 265, 266, 267.1, 268.2, 268.3 268.5, 268.7, 269, 278.6, 282, 287.32, 288, 323.2, 431.4, 532, 533, 611, 612, 633, 634, 635.1, 635.2, 641, 642, 65, 662, 663, 69, 791.91, 894.6.

Table A.2.2 (Contd.)

Use-based classification	NIC (ASI before 1970)	SIC (ASI after 1970)	RITC (Before 1977)	ITC-REV-2 (After 1977)
Capital goods	360, 370, 381, 382, 386, 389, 391, 392	350, 351, 352, 353, 354, 355, 356, 357, 360, 361, 365, 366, 367, 369, 370, 371, 372, 373, 377, 378, 379, 380, 381	71, 72, 731, 734, 735, 812.1	711, 712, 713, 714, 716, 718, 721, 722, 723, 724, 727, 728.1, 728.4, 736, 737, 741, 31, 741.4, 761, 762, 764, 771, 772, 773, 774, 775.4, 775.8, 776, 778, 791, 792 793, 812.1, 902
Consumer goods				
(i) Consumer durables	383, 384, 385, 393, 394, 395, 399	276, 277, 342, 345, 358, 359, 374, 375, 376, 38, (ex 380, 381)	275.1B, 275.2, 667, (ex 667.1A, ex 667.2A, ex 667.3A), 732, 733, 812.2, 821, 831.0B, 861, 862, 863, 864, 897, 891, 893, 894, ex 894.3, 895.1, 895.2, 895.9, 896, 899, (ex 899.3, ex 899.4)	277.1, 277.2, 667 (ex 667.1001, ex 667.2, ex 667.31, ex 667.33, ex 667.4002), 697, 81, 697.35, 75, 762.8, 763, 764.9, 775.1, 775.2, 775.3, 775.7, 781 to 786 821, 848.21, 87, 881 to 885, 893, 894, 895.1, 895.2, 896, 899 (ex 899.3, ex 899.4), 951.09.

Table A.2.2 (Contd.)

Use-based classification	NIC (ASI before 1970)	SIC (ASI after 1970)	RITC (Before 1977)	ITC-REV-2 (After 1977)
(ii) Consumable non-durables	20-21, 22, 231, 232, 239, 241, 243, 260, 280, 293, 319, 332, 333.	20-21, 22, 231, 232, 234, 235, 236, 239, 241, 242, 243, 24[illegible] 246, 247, 248, 249, 260, 262, 263, 264, 265, 266, 282, 284, 285, 286, 288, 289, 291, 292, 293, 295, 296, 299, 301, 313, 314, 317, 319, 321, 322, 323, 327.	541, 551, 553, 554, 655.4, 655.5, 655.8, 655.9, 656.1, 656.6, 656.9, 658.2, 658.3, 658.4, 658.5, 658.6, 664, 665, 666, 831, 841.1, 841.4(1), 892, 899.3	541, 551, 553, 554, 664, 665, 666, 831.0201, 831.0901, 842, 843, 844, 847, 848, 892, 899.3, 899.4

Table A.3.1

Value of Production in Indian Manufacturing Sector

(Rs. crores at current prices)

Sl. no.	ASI code	Name of the industry group	1969-70	1974-75	1979-80	1984-85
1.	20-21	Food products	2453.78	4356.66	7382.61	13684.54
2.	22	Beverages, tobacco & tobacco products	403.28	628.49	1035.14	1990.13
3.	23-26	Textiles	2225.99	4081.82	6774.97	10380.10
4.	27	Wood & wood products, furniture & fixtures	100.93	218.51	379.06	636.98
5.	28	Paper & paper products, printing, publishing & allied industries.	383.88	864.37	1442.52	3076.88
6.	29	Leather, leather & fur products	93.22	200.41	622.66	860.05
7.	30	Rubber, petroleum & coal products	562.63	1683.81	4287.30	10452.26
8.	31	Chemical & chemical products (except products of petroleum & coal)	1246.29	4044.19	8584.50	17908.59

Table A.3.1 (contd.)

Sl. no.	ASI code	Name of the industry group	1969-70	1974-75	1979-80	1984-85
9.	32	Non-metallic mineral products	373.28	701.25	1417.55	3869.18
10.	33	Basic metal & alloy industries	1173.36	2636.01	5932.00	12854.54
11.	34	Metal products & parts except machinery	332.97	625.21	1213.52	1992.45
12.	35	Machinery, machine tools & parts except electrical machinery	595.07	1485.64	2966.49	5941.87
13.	36	Electrical machinery, apparatus, appliances & supplies & parts	520.70	1384.36	2980.13	5562.00
14.	37	Transport equipment & parts	667.64	1360.74	2778.57	5831.82
15.	38	Other manufacturing industries	206.45	173.38	400.43	755.86
		Total	11339.47	24444.85	48197.45	95795.25

Source: Annual Survey of Industries.

Table A.3.2

Value of India's Industrial Imports

(Rs. crores at current prices)

Sl. no.	ASI code	Name of the industry group	1969-70	1974-75	1979-80	1984-85
1.	20-21	Food products	59.0562	99.1505	152.0222	459.6612
2.	22	Beverages, tobacco & tobacco products	0.5110	0.8295	0.4602	1.5022
3.	23-26	Textiles	16.7624	23.3786	68.6745	191.2868
4.	27	Wood & wood products, furniture & fixtures	0.2188	1.5247	5.3432	7.3608
5.	28	Paper & paper products, printing, publishing & allied industries.	41.2259	76.8921	205.4129	412.4889
6.	29	Leather, leather & fur products	0.0643	0.1594	0.1752	10.0814
7.	30	Rubber, plastic, petroleum & coal products	141.5834	1165.4870	3284.5715	3543.0205
8.	31	Chemical & chemical products (except products of petroleum & coal)	217.6787	754.0815	1503.1268	3555.7593
9.	32	Non-metallic mineral products	3.7656	9.1842	94.3145	82.3083
10.	33	Basic metal & alloy industries	156.7988	597.5793	1208.9385	1486.0614

Table A.3.2 (Contd.)

Sl. No.	ASI code	Name of the industry group	1969-70	1974-75	1979-80	1984-85
11.	34	Metal products & parts except machinery	8.7222	28.4989	105.8865	190.1147
12.	35	Machinery, machine tools & parts except electrical machinery	279.2112	396.7540	698.6961	1899.8957
13.	36	Electrical machinery, apparatus, appliances & supplies & parts	63.6344	150.1269	250.2249	673.5664
14.	37	Transport equipment & parts	49.8190	122.8970	336.5255	368.8513
15.	38	Other manufacturing industries	47.7339	91.1276	555.1778	1484.8435
		Total	1086.7858	3517.6712	8469.5503	14366.8026

Source: Monthly Statistics of Foreign Trade of India. Volume-II, Imports March Issues of 1970, 1975, 1980, 1985.

Table A.3.3

Index Numbers of Imports of the Unit Values

(1970-71=100)

Sl. No.	Item	1969-70	1974-75	1979-80	1984-85
1.	Food	102	229	385	362
2.	Beverages & tobacco	90	182	232	359
3.	Textiles yarn fabrics	98	176	190	298
4.	Wood & wood products	105	220	131	144
5.	Paper & paper products	92	226	255	366
6.	Leather & leather products	107	159	428	161
7.	Rubber, petroleum & coal products	95	583	1617	3051
8.	Chemical & chemical products	98	247	241	351
9.	Non-metallic mineral products	88	134	602	239
10.	Basic metal & alloy industries	90	180	229	244
11.	Manufacturing of metals	98	157	319	273
12.	Machinery except electrical	111	181	419	368
13.	Electrical machinery	79	138	229	244
14.	Transport equipment	112	171	257	363
15.	Miscellaneous manufacturing industries	69	159	434	512
	General Index	100	239	360	421

Source: ITJ Vol. 275, February, 1976. Vol. 298, November, 1981. Vol. 320, June, 1987.

Table A.3.4

Index Number of Wholesale Prices

Sl. No.	ASI code	Name of the Industry Group	1969-70	1974-75	1979-80	1984-85
1.	20-21	Food products	94.6	186.9	214.8	328.8
2.	22	Beverages, tobacco & tobacco products	93.8	148.2	186.6	254.0
3.	23-26	Textiles	90.7	159.8	203.2	280.1
4.	27	Wood & wood products, furniture & fixtures	94.9	157.8	219.2	369.3
5.	28	Paper & paper products, printing, publishing & allied industries.	98.4	184.8	237.4	363.5
6.	29	Leather, leather & fur products	101.9	184.0	345.0	413.6
7.	30	Rubber, petroleum & coal products	98.7	253.9	483.6	736.8
8.	31	Chemical & chemical products (except products of petroleum & coal)	94.5	168.8	198.7	292.1

Table A.3.4 (Contd.)

Sl. no.	ASI code	Name of the Industry Group	1969-70	1974-75	1979-80	1984-85
9.	32	Non-metallic mineral products	94.2	163.3	249.5	430.6
10.	33	Basic metal & alloy industries	91.7	173.7	256.8	443.0
11.	34	Metal products & parts except machinery	87.5	169.2	234.8	388.5
12.	35	Machinery, machine tools & parts except electrical machinery	89.8	155.2	218.8	324.5
13.	36	Electrical machinery, apparatus, appliances & supplies & parts	91.4	158.1	199.8	253.2
14.	37	Transport equipment & parts	97.7	156.8	229.9	323.6
15.	38	Other manufacturing industries	99.2	171.9	206.7	237.8
		Manufacturing Products	94.8	174.9	217.6	338.4

Source: Chandhok, WPI.

Table A.3.5

Value of Production

(at constant prices (1970-71 = 100)

Sl. No.	ASI code	Name of the industry group	1969-70	1974-75	1979-80	1984-85
1.	20-21	Food products	2593.84	2331.01	3436.97	4161.96
2.	22	Beverages, tobacco & tobacco products	429.94	424.08	554.74	783.52
3.	23-26	Textiles	2454.23	2554.33	3334.14	3705.86
4.	27	Wood & wood products, furniture & fixtures	106.35	138.47	172.93	172.48
5.	28	Paper & paper products, printing, publishing & allied industries	390.12	467.73	607.63	846.46
6.	29	Leather, leather & fur products	91.48	108.92	180.48	207.94
7.	30	Rubber, plastic, petroleum & coal products	570.04	663.18	886.54	1418.60

Table A.3.5 (Contd.)

Sl. No.	ASI code	Name of the industry group	1969-70	1974-75	1979-80	1984-85
8.	31	Chemical & chemical products (except products of petroleum & coal)	1318.83	2395.85	4320.33	6130.98
9.	32	Non-metallic mineral products	396.26	429.42	568.16	898.56
10.	33	Basic metal & alloy industries	1279.56	1517.56	2292.12	2901.70
11.	34	Metal products & parts except machinery	380.54	369.51	516.83	588.61
12.	35	Machinery, machine tools & parts except electriclal Machinery	662.66	957.24	1355.80	1831.08
13.	36	Electrical machinery, apparatus, appliances & supplies & parts	569.69	875.62	1491.56	2196.68
14.	37	Transport equipment & parts	683.36	867.82	1208.60	1802.17
15.	38	Other manufacturing industries	208.11	100.86	193.73	317.01
		Total (a)	12135.01	14201.60	21120.56	27963.61
		(b)	11961.47	13976.47	22149.56	28308.29

Notes:

(a) Total of 1 to 15.

(b) Deflated by index of manufacturing industries.

Table A.3.6

Value of Imports at Constant Prices (1970-71 = 100)

(Rs. in crores)

Sl. no.	ASI code	Name of the industry group	1969-70	1974-75	1979-80	1984-85
1.	20-21	Food products	57.8982	43.2972	39.4863	126.982
2.	22	Beverages, tobacco & tobacco products	0.5678	0.4558	0.1984	0.4184
3.	23-26	Textiles	17.1045	13.2833	36.1445	64.1902
4.	27	Wood & wood products, furniture & fixtures	0.2084	0.6930	4.0788	5.1117
5.	28	Paper & paper products, printing, publishing & allied industries	44.8108	34.0231	80.5541	112.7019
6.	29	Leather, leather & fur products	0.0601	0.1003	0.0409	6.2617
7.	30	Rubber, plastic, petroleum & coal products	149.0352	199.2120	203.1274	116.1265
8.	31	Chemical & chemical products (except products of petroleum & coal)	222.1211	305.2962	623.7041	1013.0368

Table A.3.6 Contd.

Sl. no.	ASI code	Name of the industry group	1969-70	1974-75	1979-80	1984-85
9.	32	Non-metallic mineral products	4.2791	6.8539	15.6668	34.4386
10.	33	Basic metal & alloy industries	174.2209	331.9885	527.9207	609.0415
11.	34	Metal products & parts except machinery	8.9002	18.1522	33.1933	69.6191
12.	35	Machinery, machine tools & parts except electrical Machinery	251.5420	219.2011	161.5774	516.2760
13.	36	Electrical machinery, apparatus appliances & supplies & parts	80.5499	108.7876	109.2685	276.0518
14.	37	Transport equipment & parts	44.4813	71.8696	130.9438	101.6119
15.	38	Other manufacturing industries	69.1796	57.3130	127.9212	290.0085
		Total (a)	1124.9591	1411.2268	2093.8262	3341.8766
		(b)	1086.7858	1471.8290	2352.6529	3412.5422

Notes:

(a) Refers to total of all the industries (1 to 15).

(b) Refers to total of the manufacturing sector at current prices deflated by the General index of the unit values of imports.

Table A.3.7

Trends in India's Imports, Production & Availability Since 1973-74

(In Rs. crores at current prices)

Sl.No.	Code No.	Name of the sector		1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
1.	30	Rubber, petroleum	I	567.36	1165.49	1233.30	1419.30	1565.07	1688.34	3284.57	5283.57	5215.50	5959.53	4864.96	3543.02
		& coal products	P	615.70	1683.81	2144.73	2501.97	2992.68	3331.63	4287.30	5682.88	7208.28	9559.56	9112.92	10452.26
			A	1183.06	2849.30	3378.01	3921.27	4557.75	5019.97	7571.87	10966.45	12423.78	15518.09	13977.88	13995.28
2.	304, 305	Petroleum crude	I	560.27	1156.95	1225.69	1412.06	1550.98	1676.77	3267.08	5263.47	5189.26	5621.92	4831.99	3494.14
			P	387.28	1088.58	1352.38	1672.35	2081.32	2292.89	3050.87	3926.08	5370.31	7255.90	6720.79	7676.02
			A	947.55	2245.53	2578.07	3084.41	3632.30	3969.66	6317.95	9189.55	10559.57	12877.83	11552.78	11170.16
3.	31	Chemical &	I	421.73	754.08	751.61	577.12	1586.85	1596.34	1503.13	2141.55	2222.81	1619.14	2348.17	3555.76
		chemical products	P	2851.10	4044.19	4651.32	5270.17	6274.74	6115.30	8584.50	10176.41	12440.85	14042.85	15871.44	17908.59
			A	3272.83	4798.27	5402.93	5847.29	7861.59	7711.64	10087.63	12317.96	14663.66	15661.99	18219.61	21464.35
4.	311	Fertilizers	I	162.20	425.18	434.49	197.72	258.12	370.72	371.22	652.30	509.71	204.56	204.48	1006.57
			P	433.68	758.58	893.93	980.47		1364.58	1701.57	2005.17	2807.84	3234.30	3533.46	3760.48
			A	595.88	1183.76	1328.42	1178.19		1735.30	2072.79	2657.47	3317.55	3438.86	3737.94	4767.05

Table A.3.7 (Contd.)

Sl.Code	Name of the sector		1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
5. 33	Basic alloy	I	385.36	597.58	406.74	385.95	467.00	743.45	1208.94	1365.06	1710.35	1616.21	1575.70	1486.06
	metals	P	2034.76	2636.01	3030.59	3615.59	3807.67	4899.80	5932.00	7181.55	9243.31	10669.41	10357.14	12854.54
		A	2420.12	3233.59	3437.33	4001.54	4274.67	5643.25	7140.94	8546.61	10953.66	12285.62	11932.84	14340.60
6. 34	Manufacture of	I	23.70	28.50	33.38	36.60	83.40	114.18	105.89	149.08	179.08	143.86	149.28	190.12
	metals	P	533.58	625.21	710.73	833.49	949.11	974.54	1213.52	1393.82	1652.20	1758.48	1690.78	1992.45
		A	557.28	653.71	744.11	870.09	1032.51	1088.72	1319.41	1542.90	1831.28	1902.34	1840.06	2182.57
7. 35	Machinery except	I	416.46	396.75	564.49	658.73	637.27	706.60	698.70	973.95	1229.23	1417.91	1989.74	1899.90
	electrical	P	1039.72	1485.64	1690.90	1705.41	2190.86	2485.84	2966.49	3585.90	4257.68	4809.94	4861.58	5941.87
		A	1456.18	1882.39	2255.39	2364.14	2828.13	3192.44	3665.19	4559.85	5486.91	6227.85	6851.32	7841.77
8. 36	Electrical	I	124.14	150.13	187.18	173.01	163.34	214.85	250.23	293.41	397.31	458.94	622.03	673.57
	machinery	P	1114.96	1384.36	1669.79	1918.02	2099.65	2350.77	2980.13	3619.22	3918.35	4740.64	4486.78	5562.00
		A	1239.10	1534.49	1856.97	2091.03	2262.99	2565.62	3230.36	3912.63	4315.66	5199.58	5108.81	6235.57

Notes: I = Imports.
P = Production.
A = Availability.

Source: ASI, MSFTI.

Table A.3.8

Trends in India's Imports, Production & Availability Since 1973-74

(In Rs. crores at constant prices 70-71 = 100)

Sl.no.	Code no.	Name of the sector		1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
1.	304, 305	Crude petroleum	I	169.27	158.70	149.29	154.16	163.95	177.62	217.81	232.28	192.19	217.31	199.92	130.33
			P	122.13	158.57	193.11	225.90	264.26	285.58	220.44	192.29	252.04	365.72	386.36	441.35
			A	291.40	317.27	342.40	380.06	428.21	463.20	438.25	424.57	444.23	583.03	586.28	571.68
2.	31	Chemical & chemical products	I	337.38	305.30	239.37	281.52	793.42	763.80	623.70	706.78	733.60	570.12	844.66	1013.04
			P	2449.40	2395.84	2648.82	3074.78	3631.22	3451.07	4320.33	4217.33	4781.26	5216.51	5636.16	6130.98
			A	2786.78	2701.14	2888.19	3356.30	4424.64	4214.87	4944.03	4924.11	5514.86	5786.63	6480.82	7144.02
3.	311	Fertilizer	I	112.64	144.62	107.28	97.40	126.53	179.96	157.30	204.48	144.80	68.88	75.18	272.78
			P	380.76	373.68	416.36	525.72		778.87	1017.69	826.19	1026.26	1164.67	1320.92	1432.56
			A	493.40	518.30	523.64	623.12		959.83	1174.99	1030.67	1171.06	1233.55	1396.10	1705.34
4.	33	Basic alloy metals	I	318.48	331.99	193.68	203.13	240.72	385.21	527.92	626.18	780.98	728.02	679.18	609.04
			P	1463.86	1527.24	1639.93	1901.94	1964.74	2319.98	2354.90	2639.31	2914.95	3008.86	2718.41	2901.70
			A	1782.39	1859.23	1833.56	2105.07	2205.46	2705.19	2882.82	3265.49	3695.93	3736.88	3397.59	3510.74

Table A.3.8 (Contd.)

Sl.Code no.	no.	Name of the sector		1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
5.	34	Manufacturing of metals	I	24.44	18.15	21.12	19.26	33.10	29.81	33.19	42.35	47.75	31.27	46.36	69.64
			P	419.49	369.51	404.28	458.97	491.77	483.88	516.83	534.85	577.50	575.61	520.72	588.61
			A	443.92	387.66	425.40	478.23	524.87	513.69	550.02	577.20	626.25	606.88	567.08	656.25
6.	35	Machinery except electrical	I	306.22	219.20	221.37	235.26	191.95	216.75	166.75	359.39	-	527.10	627.68	516.28
			P	826.49	957.24	964.03	968.98	1231.51	1313.87	1355.80	1457.68	1548.25	1651.77	1560.20	1831.08
			A	1132.71	1176.44	1185.40	1204.24	1423.46	1530.62	1522.55	1817.07	-	2178.87	2187.88	2347.36
7.	36	Electrical machinery	I	144.34	108.79	105.75	94.03	204.18	121.38	109.27	-	240.79	312.21	264.69	276.05
			P	955.41	875.62	985.13	1181.05	1274.06	1359.61	1491.56	1733.34	1772.21	2058.46	1872.61	2196.68
			A	1099.75	984.41	1090.88	1275.08	1478.24	1480.94	1600.83	-	2013.00	2370.67	2137.30	2472.73

Notes: I = Imports.
P = Production.
A = Availability.

Source: ASI, MSFTI,WPI, SA.

Table A.4.1a

Estimates of Direct and Indirect Requirements of Imports for the Year 1973-74

(Rs. million at 71-72 prices)

Sl. No.	ASI Code	Sector	Final demand	Estimated output	Import ratio	Estimates of direct & indirect requirement of imports for	
						Total final demand	Per unit of final demand
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	1-10,62 63-64	Agriculture & service sector	336141.8	402738.6	0.0197	9861.2	0.0293
2.	11-14	Food products	37225.0	65044.7	0.0150	1428.3	0.0384
3.	15,18,28	Textiles	34268.6	55146.2	0.0034	1142.4	0.0333
4.	19	Wood & wood products	2418.2	3096.9	0.0003	43.7	0.0177
5.	20,61	Paper & paper products	2459.1	3235.8	0.2455	696.4	0.2832
6.	21	Leather & fur products	1877.8	3647.3	0.0002	131.9	0.0702

Table A.4.1a (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
7.	22,26,30	Rubber, petroleum & coal products	3241.8	4932.3	0.2116	734.4	0.2266
8.	23-25 27,29	Chemical & chemical products	5414.2	6664.9	0.2684	1477.5	0.2729
9.	31-33	Non-metallic mineral products	1657.4	2048.7	0.0426	99.1	0.0598
10.	34-35	Basic metal & alloy industries	910.6	1114.4	0.2003	207.9	0.2283
11.	36-39	Metal products & parts except machinery	7726.0	1078.2	0.0109	644.7	0.0835
12.	40,42,43	Machinery, machine tools & parts	6331.4	2594.7	2.5603	4766.1	0.7528
13.	41,44-51	Electrical machinery	7712.7	11998.4	0.0482	973.3	0.1262
14.	52-57	Transport equipment	7006.4	12094.8	0.0238	746.6	0.1066
15.	58-60	Miscellaneous industries	4558.0	7606.3	0.0155	456.2	0.1001
		Total	458949.0	577042.2		23409.7	

Source: A Technical note on the Fifth Plan of India (1975-80), Government of India.

Table A.4.1b

Estimates of Direct and Indirect Requirements of Imports Using Current Year (1979-80) Final Demand & Base Year (1973-74) Import Ratio

Sl. No.	Sector	Final demand	Estimated output	Import ratio	Estimates of direct & indirect requirement of imports for	
					Total final demand	Per unit of final demand
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Agriculture	355732.9	426211.6	0.0197	10435.9	0.0293
2.	Food products	56521.9	98762.8	0.0150	2171.7	0.0384
3.	Textiles	42166.5	67855.8	0.0034	1405.7	0.0333
4.	Wood & wood products	2439.4	3127.0	0.0003	43.1	0.0177
5.	Paper & paper products	852.6	1121.9	0.2455	241.4	0.2831
6.	Leather & fur products	2916.2	5664.2	0.0002	204.8	0.0702
7.	Rubber, petroleum & coal products	2097.0	3190.5	0.2116	475.0	0.2266

Table A.4.1b (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
8.	Chemical & chemical products	245.3	302.0	0.2685	66.9	0.2729
9.	Non-metallic mineral products	3256.5	4025.4	0.0426	194.7	0.0598
10.	Basic metal & alloy industries	-1692.3	-2071.0	0.2003	-386.4	0.2283
11.	Metal products & parts except machinery	4977.2	6945.8	0.0109	415.3	0.0834
12.	Machinery, machine tools & parts	11905.9	4879.1	2.5603	8962.3	0.7528
13.	Electrical machinery	7505.3	1675.7	0.0482	947.1	0.1262
14.	Transport equipment & parts	9822.9	16956.8	0.0238	1046.7	0.1066
15.	Miscellaneous industries	11282.5	18828.1	0.1552	1129.2	0.1001
	Total	510029.8	657472.7		27353.4	

Source: Technical Note on the Sixth Plan of India 1982-85 (Government of India).

Table A.4.1c

Estimates of Direct and Indirect Requirements of Imports Using Base Year (1973-74) Final Demand & Current Year (1979-80) Import Ratio

Sl. No.	Sector	Final demand	Estimated output	Import ratio	Estimates of direct & indirect requirement of imports for	
					Total final demand	Per unit of final demand
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Agriculture & service	336141.8	407043.6	0.0134	6679.3	0.0199
2.	Food products	37225.0	64682.2	0.0259	1580.5	0.0425
3.	Textiles	34268.6	55690.8	0.0035	806.1	0.0235
4.	Wood & wood products	2418.2	3117.6	0.0021	31.2	0.0129
5.	Paper & paper products	2459.1	3723.8	0.1323	430.9	0.1751
6.	Leather & fur products	1877.8	3739.7	0.0002	77.9	0.0415
7.	Rubber, petroleum & coal products	3241.8	5640.1	0.0841	365.3	0.1127

Table A.4.1e (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
8.	Chemical & chemical products	5414.2	7661.5	0.1384	886.9	0.1638
9.	Non-metallic mineral products	1657.4	2125.7	0.0122	42.6	0.0257
10.	Basic metal & alloy industries	910.6	1040.9	0.2723	254.4	0.2794
11.	Metal products & parts except machinery	7726.0	10629.8	0.0106	742.5	0.0961
12.	Machinery, machine tools & parts	6331.4	8641.0	0.1064	1122.9	0.1779
13.	Electrical machinery	7712.7	11299.2	0.1013	1375.9	0.1784
14.	Transport equipment & parts	7006.4	11879.2	0.0508	867.6	0.1238
15.	Miscellaneous industries	4558.0	5960.4	0.0320	418.0	0.0917
	Total	458949.0	602875.5		15682.0	

Source: Op.cit.

Table A.4.2

India's Imports of Principal Commodities

Sl. No.	Commodity	R.B.I.		Planning Commission	
		1973-74	1979-80	1973-74	1979-80
				(Rs. Million at 71-72 Prices)	
1.	Food	2920	710	-	-
2.	Mineral oils & lubricants	2740	3470	1405	785
3.	Chemicals	2680	3720	4035	4687
4.	Iron & Steel	1890	3220	2712	3900
5.	Machinery & Transport	5090	3830	4975	1492
	Total	19960	23010	25337	23944
				At Current Prices	
1.	Food	5470	2810	-	-
2.	Minera oils & lubricants	5610	33320	-	11244
3.	Chemi ls	3570	9560	-	12070
4.	Iron & teel	2490	8340	-	10328
5.	Machi ry & Transport equipment	6520	13680	-	6633
	Total	29550	[illegible]	-	[illegible]

Source: [illegible]

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