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FOREWORD

The present study is a Phase-I report on India's Trade Dependence where the authors analyse the case of imports. Their main contention is that the over all indicator of trade-dependence in the form of Export/GNP and Import/GNP ratios conceals the closer interdependence that exists between imports on one hand and the manufacturing sector on the other. Since input relations from imports to industrial output are not known, because imports are not classified according to use, the authors thought it best to study the pattern of imports vis-a-vis the pattern of industrial output. But they discovered the lack of comparability in the data on imports and the data on industrial output because of the different schemes of classification followed by the respective agencies collecting these data. A scheme of correspondence was devised to overcome the difficulties of comparability in the data and it thus became possible to reclassify the data on imports in line with the ASI's 2-digit and 3-digit industry classification. Since such a correspondence is being used for the first time, it seems that the results obtained are not only new but also useful. Thus armed with comparable series of industrial imports and industrial output for 1960-75 the authors proceed to study systematically a number of questions.

First, they take up the question of structural change in industrial production and industrial imports and succeed in showing the vast structural changes that have swept the manufacturing sector and the import sector in India over 1960-65. The authors next take up the question of inter-dependence between industrial production and industrial imports and established how import/availability ratios and other measures of import substitution, including those furnished by Chenery, throw light on this inter-dependence. Their results show that the process of import substitution provided a major stimulus behind industrial growth during 1960-70 and that it turned to be a negative factor during 1970-75. In the remaining part of the study the authors gather further evidence in support of these findings. Thus they obtain estimates of structural parameters in the form of production and import elasticities by two different methods. The real GNP per capita and the volume of industrial output are used alternatively as independent activity variables. To capture the policy impact of import control measures the capacity to import, properly defined, is used as a proxy variable. The notable result in these exercises is that the trade policy variable did not indicate any significant impact on imports and industrial production.

Thus, the study supports the well known finding of Chenery and his associates relating to structural change and industrialization ; namely, that size and the resource base and not trade policy are the major factors that determine the pattern of industrial growth.

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Gokhale Institute of
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Pune 411 004
April 12, 1979

V. M. Dandekar
Director

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CHAPTER I

INTRODUCTION

The period beginning with 1951 happens to be a crucial one in India's economic history. It marks the beginning of the era of planning. A popularly elected government went in for massive development effort allocating public resources and directing private resources in accordance with pre-determined social priorities. This process has continued for nearly thirty years. It is important to know the impact of the pattern of economic growth during this period on the external trade relations. This is the main focus of this study.

Until now, no systematic attempt has been made to unearth this relationship of India's economic growth with her foreign trade — partly because of the widespread belief that foreign trade is an unimportant sector in India's total economic set up. The support for this view is sought in the fact that large countries tend to have a deep and wide market, and a diversified resource-base. This allows their growth to be inward oriented and consequently less dependent on foreign trade as revealed by the low ratios of exports and imports to their gross national product (GNP). India is thus shown as a large country and a large economy characterised by low export/ GNP and import/ GNP ratios. Moreover, it is further shown that over 1951-72, these ratios have declined from 10 per cent to 4 per cent. From this it is naturally concluded that in India foreign trade has played a small and declining role in the economic development during 1951-75. However, this would be a rather superficial view. A proper understanding of the role of foreign trade in India's post-war economic development requires disaggregative analysis. It is our conjecture that the disaggregative analysis may delineate a subset of foreign trade and industry where their mutual interdependence may be quite high. This means trade after all is not an unimportant factor in relation to industrial growth. The reason why we think this interdependence might be high is that during the last thirty years the developmental effort has taken the form of pushing ahead broadly on the industrial front. Like in many countries, in India too, industrialization and economic development have been treated as synonymous. As a consequence, massive public sector and private sector investments in the industrial sphere have turned the manufacturing sector into the position of a leading sector. This role for the industrial sector must imply that, wherever possible, the foreign trade sector must perform the role of a

balancing factor i.e. siphoning off surpluses through exports and filling in deficiencies by way of imports in terms of capital goods and technical know-how. In a situation like this the foreign trade sector and the industrial sector must, therefore, interact closely. If they in fact do so, the linkages from the industrial sector on to the foreign sector must then be large and powerful than the other way round. These linkages will thus throw light on not only the *degree* of interdependence but on the *nature* of interdependence as well. We shall then find how in the face of a changing profile of industrial output, the importance of some exports and imports decline and of some others rise in their place. The basic factors behind these shifts will then be pull factors of excess demands and push factors of excess supplies originating in the industrial sphere of the economy. Behind this process lie the influence not only of massive public and private sector investments in the industrial sphere, which play a primary role of initiating the process of industrial growth, but also the influence of secondary repercussions of this process in terms of the growth of second level industries, interindustry demand and the growing size of the domestic market through additional income-generation. In increasing the size of domestic market, no less important is the role of government expenditures, on developmental and non-developmental heads like defence and administration, education and social welfare which include government consumption, transfer payments and wage payments to bureaucracy. Thus, the basic aim behind the thrust in the industrial sphere is to accelerate the process of industrial transformation by maximising the use of domestic resources, both human and material. It also aims at increasing the degree of self-reliance through import substitution and through a deliberate creation of the domestic market. Towards this end, the import sector is subjected to tariff and quantitative restrictions, so that the spill-over effects of additional income generation directly through industrial programmes and indirectly through government spending are not allowed to leak out abroad. Only those imports which are needed to keep up the pace of industrial growth are permitted. This structural study on India's trade dependence aims precisely at finding out how an internally generated growth impings on the structure of trade.

We are tempted to undertake this study because of the increasing number of such cross-sectional studies in the sixties on structural interrelations between trade and growth. Though India did figure as one of the countries in some such studies, there exists no time-serial enquiry into the interrelations between India's industrial patterns and trade. In this regard, we were guided by the advice of Aljandro to the effect that in future trade development studies 'fresh insights are most likely to come from disaggregated and sample data than further manipulation of macro-economic aggregates'. Thus, in this study we examine India's disaggregative trade and industrial output data over 1960-75 and see how the shifts in the patterns of industrial output bring about the shifts in the patterns of exports and imports. We divide this study in two phases. In Phase I, we carry out detailed disaggregative analysis into India's import patterns in relation to its patterns of industrial output. In Phase II, we study India's export patterns in relation to its industrial growth. It is important to underline the fact that we do

not enquire into the influences that operate from trade to growth, which we believe to be weak thanks to the reasoning outlined above. We do not analyse directly the role of foreign aid in the following pages though indirectly its influence does appear in permitting import surpluses year after year and in determining import patterns, when imports are project-tied.

Method

This study aims at getting statistical measures that can throw light on the interdependence between India's industry and trade. To get at these relations we study the Indian manufacturing sector covered by the Annual Survey of Industry at 2 and 3 digit levels; we use the trade data available in the Monthly Statistics of Foreign Trade and reclassify it to bring it into line with the industry data. For this, the scheme of correspondence devised by L. Argade and V. Pitre has been adopted. These comparable series of industry and trade are then used to study the intersectoral shifts between industry and trade (Chapter IV) and to measure import substitution (Chapter V). In Chapter VI, we present industrywise the elasticity coefficients for production and imports by means of comparing individual growth-rates with the overall growth-rate in industry as a whole. We then use in Chepter VII, the method of multiple regression to know the relative importance of the main explanatory factors that probably lie behind these interrelations. We undertake two exercises. First, we try to see the dependence of imports (real) on industrial production (real) and the capacity to import. Second, we express individual industrial production values as functions of real GNP per capita and the capacity to import. We hope the interested scholars will find this study useful.

CHAPTER II

THE TRADE DEVELOPMENT NEXUS

The questions as to how trade changes in the course of economic growth and how growth reacts under the impact of trade have received insufficient attention compared to the advances in the pure theory of trade and tariffs. As a matter of fact, the standard trade theory has ignored economic development except under the narrowly restricted domain of arguments for infant industry protection and the theory of economic development has neglected intrnational trade as an integral part of its approach. This neglect is surprising in view of the recognition foreign trade has received as an important stimulating factor behind economic development by all the leading economists of the past like the Mercantalists, Adam Smith, Ricardo, Mill and Marshall[1].

Despite this neglect, there are some key contributions of a theoretical nature which throw light on the trade development nexus. The effects of capital accumulation, population growth and technical change on the volume and terms of trade have been analysed by Hicks[2] (1953), Johnson[3] (1955), Rybczynski[4] (1955) and Findlay and Grubert[5] (1959). As an off shoot of these attempts, Bhagwati[6] (1958) highlighted the possibility of immiserizing growth arising out of "high values of the output elasticity of supply and low values of domestic income elasticity and foreign price-elasticity of demand".[7] However, these neoclassical off-track incursions in the vast terrain of trade and development are of limited importance.

Likewise, the development theorists recognised the scope and limitations of foreign trade as an instrument of economic growth. Myrdal (1957)[8] has considered trade relations between the centre and the periphery as a crucial aspect of the problem of underdevelopment of the latter. He admitted that foreign trade has "spread effects" in the form of growing markets, new products and new technology but at the same time it yielded backwash effects in the form of diversion of capital and skilled labour from the periphery to the centre. Nurkse[9] (1959) asserted that trade has ceased to be 'an engine of economic growth' which it was during the nineteenth century but even in the nineteenth century, as Kravis[10] (1970) has recently shown, "trade was a handmaiden rather than an engine of economic growth for the most successful developers." Following Kindleberger, we can call it "an apportunistic handmaiden"; while trade may

serve growth, it could serve structures perpetuating underdevelopment.[11] Despite this, the vent for surplus or export-led growth models assign a triggering role to foreign trade in relation to economic development. While these models do have a historical basis in the case of the Guano fertiliser and the fishmeal industry of Peru, the copper industry of chille and more recently in the cases of export-led growth (supported by foreign investment and cheap local labour) of Taiwan, Korea and Hongkong, they lack the power of general application. The colonial history has furnished a number of examples of abortive export-led growth experiences because of (a) a narrow domestic market, (b) polarised income distribution and (c) heavy import leakages. The absence of the viable middle class made for this inevitable outcome because in that case the export-led growth in the form of primary products exports have led only to enclave effects coupled with the strengthening of landlords and princes in these economies. These experiences have shaped the post-independence trade policies of the colonies. When these countries regained their decision-making power through political independence, they began following inward-oriented trade policies in the form of tariffs, quotas and tight exchange control. The policy makers in these countries have ignored the advice tendered by the professional (neo-classical) mainstream. It highlights the fact that markets do not operate in a political vacuum and that given the political independence, markets can be shaped to suit the country's economic interests. This view seems to have been coloured by the past experience when under colonialism, coupled with free trade, markets led to price formations and price-fluctuations the outcome of which amounted to a concealed transfer of resources to the centre from the periphery. It also reflects the fear that free trade policies, if pursued again, will lead to a similar outcome.[12]

Thus, these countries use tight import control policies and policies of direct subsidies to exports. These policies are further buttressed by other domestic policy tools like industrial licensing, capital issue control, development rebates, tax holidays and low interest rate lending by public lending institutions. These policies are meant for insulating the domestic market from foreign competition; extending the size of the domestic market; and pursuing a desired pattern of industrialization dictated by domestic factors. In other words, tariffs and quotas are adjusted so as to make the chosen projects economically viable at domestic costs and prices.[13] The trade policies, therefore, do not play a causal role in shaping the pattern of industrial development in this type of economy. Theirs is essentially a permissive function.

Economic research over the last twenty years clearly lends strong support to this view. Trade policies differ in accordance with the size and the resource-base of different economies. Hongkong, Korea and Taiwan follow policies having a strong pro-trade bias unlike India and Brazil. The results on industrial patterns of less developed countries by Chenery and Taylor clearly indicate the crucial role played by the size and the resource-base of nations. The variance in policies "appears to speed or delay a given less developed country along its pre-ordained development path."[14] The policy changes cannot significantly change the structural pattern of production.

A number of leading economists[15] have participated in the marathon debate

of the sixties on the cost of these trade policies. In particular, Little, Scott and Scitovsky[16] and Bhagwati and Srinivasan[17] look upon these trade policies as being responsible for adverse income distribution, excess capacity, unemployment, high capital intensities, heavy cost of protection, loss of export opportunities, high incidence of illicit trade practices and administrative delays and corruption. But despite this scathing attack, research on the trade policies in the nineteen sixties indicates that the quantification of the effects of the trade policies do not furnish significant results. The cost of protection as measured by the sum represented by the familiar Marshallian triangles (Johnson[18] (1960), Stern[19] (1964), Basevi[20] (1968), Magee[21] (1972)) furnish small static estimates. The studies on the cost of protection have gained sophistication as a result of the application of new methods like Effective Protective Rates[22] and Domestic Resource Costs.[23] The results are not clear-cut because of some unsettled methodological issues. Even the comparison of internal and external prices turns out to be misleading as a measure of the cost of protection because of an overvalued exchange rate. At corrected exchange rates the inefficiencies measuring the static allocation of effects are not alarming.*

The rationale behind the trade policies of the less developed countries becomes clear if we take into account the urgency of industrialization. Industrialization was chosen as a basic goal because it brings with it a variety of dynamic effects like acceleration of economic growth, extension of the domestic market, deepening of capital via technical progress, uplifting of the working force via technical and occupational training. In this context the strategy of import substitution gained wide acceptance. It derived further strength through the export pessimism prevailing everywhere in the fifties and sixties. The intellectual underpinning for industrialization via import substitution was provided by the two-gap models of Chenery & Bruno[24] and Chenery & Strout[25] who rationalized the increasing role for foreign aid. This alone was not enough. Hirschman's criticism[26] of the 'Exhausting Model of Import Substitution' therefore, emphasised the principle that the market is a matter of planning and policy; he suggested that the strategic importance of basic products like steel, power, paper, cement, glass, etc., should be adequately recognised for advance investment action; and that the interdependencies in investment-decision-making in regard to other products should always be kept in view. Hirschman believes that the potential for economic growth can be tapped through the above strategy and need not be based on the strategy of import substitution alone.

Since the main contention of this study is that the impulses of economic growth are mainly internal in origin for countries like India, its main focus is on the investigation of the linkages that operate from industry to trade during 1956-75. We ignore the linkages from trade to industry as they are unimportant in our view.

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* Effective protective rates have given rise to a number of difficult questions like value-added not having natural units; separability of production functions and biased and unbiased substitution effects arising out of substitution between intermediate and primary inputs. The calculations of domestic resources costs are subject to variation because of arbitrarily chosen shadow prices.

In the following pages, we shall examine the empirical experience of India during 1956-75 based on the theoretical foundations discussed above which establish the primacy of growth over trade. Economists of neoclassical inclinations call for liberalised trade policies instead. One must guard against the neoclassical chorus in favour of trade liberalisation in view of export optimism of the seventies. It is true that the foreign exchange constraint is not as binding as before (a view that can be disputed in a situation where 80% of our export earnings will be eaten up by oil imports). But we must remember that it was not the export pessimism of the fifties or the sixties but the imperatives of internally generated growth that basically shaped the programme of industrialization; these imperatives are valid even today. What is needed now is to get out of the weaknesses of the import substitution syndrome.

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CHAPTER III

DEVELOPMENTS IN INDIAN INDUSTRY AND FOREIGN TRADE

In the course of the last chapter we tried to formulate a theoretical case for looking at India's effort at Industrialisation as a case of endogenous growth rooted in its size and resource-base. By endogenous growth we mean setting up of a range of productive activities, particularly in the manufacturing sector, and supporting them through deliberate creation of domestic market insulated from foreign competition. Such a market, to be viable, needs support through large government spendings on defence and administration, on education, health and social welfare because employment of skilled manpower in the manufacturing sector and inter-industry demand do not furnish a sufficiently large market. A set of proindustrialisation policies of import-control, over-valued exchange rate, industrial licensing, capacity control, and industrial credit are in the nature of catalysts; they are devices to make desired industrial projects economically viable at domestic costs and prices. Basic investment decisions are guided by domestic resource-base and its use in the service of the domestic market deliberately designed for this purpose. Policies thus play a permissive and not a causal role. In this chapter we present the data on some aspects of the Indian experience for the last 25 years which support the assertions made above. We shall find that the process of industrialisation was largely based on domestic efforts and foreign trade played a declining role in relation to GNP.

India's Resource-Base

The details on India's resource-base are available in many official and unofficial publications. We have found the Indian Gazetteer as one of the best sources for this purpose. We find from these sources that India is a country with a remarkable endowment of natural and human resources. It has substantial deposits of iron ore, manganese, limonite and other minerals. It is equally rich in energy potential; it has coal, lignite, a modest amount of petroleum, and an immense reserve of hydro-electric power. India's resources as a whole are most suited to the growth of steel and engineering industries and coal-based chemical industries. India also has substantial skilled manpower, a well-established capitalist class and a trained bureaucracy. It has so far enjoyed a long spell of political stability. There is no need for us to go into the details of this resource-

base beyond knowing that it has provided a strong basis for pro-industrialisation efforts during the last twenty-five years.

Structure of the Indian Economy

Table 3.2 gives the size and the sectoral composition of India's real gross domestic product for three points of time 1950-51, 1960-61 and 1974-75. It shows that the total size of GDP has grown from Rs. 9591 crores in 1950-51 to Rs. 14,071 crores in 1960-61, and to Rs. 21,670 crores in 1974-75. This is almost 130 per cent increase in the real size of the economy. Table 3.1 is summarised version of table 3.2. Every sector has grown in real terms over this period in absolute terms. However, it is important to remember that all the sectors have not grown at the same pace. Industry, transport and communications, trade, power, and construction have grown faster than agriculture; and the services sector defined to include banking and real estate has grown faster than industry and related sectors during 1960-75. We thus find that the real share of the services sector, has gone up from 10.14 per cent in 1950-51 and 10.05 per cent in 1960-61 to 13.80 per cent in 1974-75; the share of industry and related sectors has gone up from 28.68 per cent in 1950-51 to 33.65 per cent in 1960-61 and to 40.66 per cent in 1974-75, but the real share of agriculture has fallen from 52.57 per cent in 1950-51 to 47.98 per cent in 1960-61 and 37.12 per cent in 1974-75. In particular, it is important to remember that in the services sector, public administration and defence, education and research, and banking and insurance have played a leading role; and in the secondary sector the registered manufacturing sector has been of decisive importance. It is thus clear that the manufacturing sector using modern technology derived its market support from the growth of the middle class. In the last chapter, we have shown how under colonialism, the absence of viable middle class led to the petering out of the growth stimuli through foreign trade.

Plan Allocations

The first five year plan gave almost the same weight to the "agriculture" and "industry" sectors.[1] The year 1956, which marked the beginning of the second five year plan, was the turning point of India's recent economic history. India opted for not only industrialisation but industrialisation of a sort that would emphasise the domestic development of heavy industry.

Table 3.3 (Plan Expenditures (Actual) by Heads of Development) shows this break with the past. A summarised version of the same table appears in table 3.8.

The modern "industry" sector has been absorbing an extremely large share of plan expenditures. On the other hand, its contribution to GDP has hardly been anywhere near the same magnitude.

India and World Trade

As can be seen from Tables 3.4 and 3.5 world trade has been expanding steadily over the period 1938-75. India's share in both, world exports and world imports over the same period, has for the most part registered a decline. This seems to have been the fate of developing countries in general. Of late, of course, the share of developing countries in world trade has risen but this increase is due

to the rise in oil prices. This is reflected in the rising share of OPEC nations in world trade during the mid-seventies, especially their share in world exports.

India's share in world exports and world imports during the early seventies has been an extremely small fraction of one per cent of the total in both cases. During the last few years, however, exports have registered a spectacular increase which might have increased India's participation in world trade.

India and the Law of Declining Trade

Table 3.9 shows the behaviour of India's imports and exports in relation to her GNP during the period 1950-51 to 1974-75. The ratios are slightly erratic but nonetheless they seem to have declined over time. Towards the end, both ratios—particularly the imports to GNP ratio—have increased. The marked increase in the imports to GNP ratio may be due to the fact that world prices (and oil prices in particular) have risen much faster than Indian prices.

The ratios of imports and exports to GNP are the conventional measures of trade-dependence of an economy. It is fairly obvious that the trade-dependence of the Indian economy as a whole has been declining over the period under consideration.

The German economic historian Werner Sombart hypothesized that after an initial expansion, foreign trade tended to decline in relation to total economic activity. The empirical support for the 'law' has been weak—there have been numerous exceptions to the rule. Nonetheless, the law exists. We do not want to assert that India's recent experience illustrates this law because the decline has come not in a natural manner but it seems to have been a consequence of India's anti-trade policies.

Pattern of India's Imports

Most studies show that with industrial growth the share of consumer goods in total imports generally falls whereas the share of intermediate goods in total imports generally rises. The share of capital goods in total imports does not generally exhibit any clear trend—its behaviour varies from country to country.

Over the period 1950-51 to 1973-74 (see table 3.6) India's imports do not seem to exhibit any particular trend.[2] Imports of capital goods have risen steadily till the mid-sixties before falling off. Imports of Raw Materials and Metals (Intermediate Goods) have *fallen* till the mid-sixties and since then have risen to a level slightly above that of 1950-51. The shares in total imports of cereals and cereal preparations and manufactured goods except metals and metal manufactures have also been extremely erratic, obviously due to the fluctuations in agricultural output.

Pattern of India's Exports

With industrual gorwth one would expect an increasing degree of industrialisation of the export structure—manufactures would form an increasing proportion of exports.

Over the period 1950-51 to 1973-74 (see table 3.7) the proportion of manufactures to total exports has shown no particular trend. As has been pointed out, this index—the percentage share of exports of manufactures to total exports—is

not a proper indicator of the incidence of industrialisation. That is so because in the early stages of industrialisation the manufactured goods that are exported are generally in their first stages of processing. The use of this index then would give an exaggerated picture of the extent of industrial transformation. The exports of *finished* manufactured goods would therefore be a better indicator of industrialisation of the export structure.[3]

Determinants of the Pattern of Industrial Growth

The pattern of industrial growth that emerges in any country depends on (i) the pattern of increase in demand with growth in incomes and (ii) the country's resource endowments both extensive and intensive resources (i.e. natural and human endowments plus technical progress).

The demand for food, beverages and tobacco and textiles expands at a relatively slow pace with increase in income. Capital goods, chemicals and consumer durables normally have high income elasticities. This imparts uniformity to the patterns of industrial growth of different countries of similar size. The studies carried out by Kuznets,[4] Chenery,[5] Maizels[6] and Chenery and Taylor[7] support this view. This has been the general pattern of industrialisation of western countries.

With growth an economy is in a better position to produce various commodities. This depends on the resource endowments of the economy and technology on the supply side and the extent of market on the demand side. The influence of natural and human resources can be modified by other factors such as economics of scale, training of labour force, technical progress, transportation and immigration. It is true, as in the Indian case, that the direction and pattern of growth may be deliberately influenced by planning. But this is only partially true; while the public and private sector decisions govern the output pattern of basic goods like steel, cement, electricity, chemicals and machinery, the pattern of final goods is determined by final demand governed by skewed income distribution and not by the designs of the planning authorities.

Different combinations of these influences operate in most countries, if not all. Still, the patterns of industrial growth that have emerged have been remarkably similar. The first of the unifying influences is the pattern of demand governed by resulting income distribution, which tends to change in a similar way in countries at broadly the same level of industrialisation. Secondly, various limitations—constraints of modern technology and skilled labour, smallness of the market, international demonstration effect on technology side etc.—operate in the earlier stages of industrialisation in most countries causing a similar pattern of growth to emerge.

The 'Typical' Pattern of Industrial Growth

In the earlier stages of industrialisation manufacturing is generally confined to the simple processing of primary products. At a later stage the manufacture of commodities that require comparatively simple technology predominates. The mature phase of industrialisation begins with the production of capital equipment using advanced, machine technology.

The transformation from a low-income economy to a high-income one involves an enormous shift from food-processing and textile industries to the manufacture of chemicals, metals and metal products.

The Pattern of Industrial Growth in India

Over the century preceding independence, India experienced considerable industrial growth. Much of this growth had taken place as a result of the world wars and the great depression. Independence found India with an industrial sector that was large by absolute standards; only on a per capita basis was it small. The basic infrastructure and other important industries were already in existence. The major industries were cotton textiles, jute textiles, vegetable oils, sugar, iron and steel and general engineering. However the technology involved was relatively simple.

The second Five Year Plan saw India opting for heavy industrialisation. Then onwards industrialisation has been taking place on a broad front with traditional and non-traditional industries existing along side one another. The pattern of industrialisation in India has followed the typical pattern of industrialisation outlined in the preceding section. A detailed discussion of the pattern of industrial growth in India is taken up in the chapters that follow. We do find there that India has succeeded in ushering the second phase in its industrialisation which involves deepening of capital and use of high level technology.

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Table 3.1 : SECTORAL COMPOSITION OF INDIA'S REAL GROSS DOMESTIC PRODUCT

(in per cent)

Sectors	1950-51	1960-61	1974-75
Primary	55.36	50.83	40.32
Secondary	16.24	19.34	24.07
Transport, Communications and Trade	12.44	14.31	16.59
Finance & Real Estate	5.82	5.47	5.22
Community and Personal Services	10.14	10.05	13.80
Total	100.00	100.00	100.00

Source : Prepared from Table 3.2.

Table 3.2 : GROSS DOMESTIC PRODUCT AT FACTOR COST BY INDUSTRY OF ORIGIN (AT 1960-61 PRICES)

(Rs. in Crores)

Industry	1950-51 *Actual figures*	1950-51 % *to the total*	1960-61 *Actual figures*	1960-61 % *to the total*	1974-75* *Actual figures*	1974-75* % *to the total*
Agriculture	5042	52.57	6751	47.98	8044	37.12
Forestry and logging	140	1.46	176	1.25	295	1.36
Fishing	48	0.50	82	0.58	131	0.61
Mining and quarrying	80	0.83	144	1.02	267	1.23
Primary	5310	55.36	7153	50.83	8737	40.32
Manufacturing	1112	11.59	1994	14.17	3810	17.58
Registered	611	6.37	1189	8.45	2548	11.76
Unregistered	501	5.22	805	5.72	1262	5.82
Construction	416	4.34	641	4.56	1119	5.16
Electricity, gas and water supply	30	0.31	86	0.61	288	1.33
Secondary	1558	16.24	2721	19.34	5217	24.07
Transport, storage and communication	398	4.15	687	4.88	1285	5.93
Railways	187	1.95	302	2.15	472	2.18
Transport by other means & storage	177	1.85	320	2.27	656	3.03
Communication	34	0.35	65	0.46	157	0.72
Trade, hotels and restaurants	795	8.29	1327	9.43	2309	10.66
Transport, communication and trade	1193	12.44	2014	14.31	3594	16.59
Banking and insurance	78	0.82	163	1.16	354	1.63
Real estate, ownership of dwelling and business services	480	5.00	606	4.31	778	3.59
Finance and real estate	558	5.82	769	5.47	1132	5.22
Public administration and defence	332	3.47	538	3.82	1592	7.35
Other services	640	6.67	876	6.23	1398	6.45
Education and research	102	1.06	212	1.51	476	2.20
Medical and health	43	0.45	68	0.48	143	0.66
Services n.e.c.	495	5.16	596	4.24	779	3.59
Community and personal services	972	10.14	1414	10.05	2990	13.80
Gross domestic product at a factor cost	9591	100.00	14071	100.00	21670	100.00

* Provisional estimates

Source : National income Estimates, *General Statistical Organisation*, New Delhi, various issues.

Table 3.3 : PLAN EXPENDITURE (ACTUAL) BY HEADS OF DEVELOPMENT *(Rs. in Crores)*

Heads of Development	*First Plan* 1951-1956		*Second Plan* 1956-1961		*Third Plan* 1961-1966		*Annual Plan* 1966-67 *to* 1968-69		*Fourth Plan* 1969-1974		*Fifth Plan* 1974-1979	
	1	2	1	2	1	2	1	2	1	2	1	2
Agriculture and allied sectors	290.0	14.8	549.0	11.7	1088.9	12.7	1107.1*	16.7	2320.4*	14.7	4643.6	11.8
Irrigation and flood control	434.0	22.2	430.0	9.2	664.7	7.8	471.0	7.1	1354.1	8.6	3434.0	8.7
Power	149.0	7.6	452.0	9.7	1252.3	14.6	1212.5	18.3	2931.1	18.6	7015.9	17.8
Village and small industries	48.0	2.1	187.0	4.0	240.8	2.8	126.1	1.9	242.6	1.5		
Industry and minerals	55.0	2.8	938.0	20.1	1726.3	20.1	1510.4	22.8	2864.4	18.2	10200.6	26.0
Transport and Communications	518.0	26.4	1261.0	22.0	2111.7	24.6	1222.4	18.4	3080.4	19.5	6881.4	17.5
Education	149.0	7.6	273.0	5.9	588.7	6.9	306.8	4.6	774.3	4.9	1284.3	3.3
Scientific Research					71.6	0.8	47.1	0.7	130.8	0.8	445.3□	1.1
Health	98.0	5.0	228.0	4.8	225.9	2.6	140.2	2.1	335.5	2.1	681.7	1.7
Family Planning					24.9	0.3	70.4	1.1	278.0	1.8	497.4	1.3
Water supply and sanitation	33.0	1.7	85.0	1.8	105.7	1.2	102.7	1.5	458.9	2.9	930.2	2.4
Housing, urban & regional development					127.6	1.5	73.3	1.1	270.2	1.7	1106.9	2.8
Welfare of backward classes					99.1	1.2	73.6	1.1	164.6	1.1	687.0**	1.8
Social welfare	32.0	1.6	83.0	1.8	19.4	0.2	11.2	0.2	64.4	0.4	86.2	0.2
Labour welfare and craftsman Training					55.8	0.7	34.8	0.5	31.1	0.2	50.1	0.1
Other programmes	160.0	8.2	186.0	4.0	173.1	2.0	115.8	1.7	179.8	1.1	1358.6@	3.5
Special schemes												
Special welfare programmes	—	—	—	—	—	—	—	—	123.6	0.8	—	—
Crash scheme for educated unemployed	—	—	—	—	—	—	—	—	54.0	0.3	—	—
Advance actions for fifth plan	—	—	—	—	—	—	—	—	120.0	0.8	—	—
Total	1960.0	100.0	4672.0	100.0	8576.5	100.0	6625.4	100.0	15788.8#	100.0	39303.2	100.0

Notes: * Includes Buffer Stock: Rs. 140 crores for 1968-69 and Rs. 124 crores on Fourth Plan against the original plan provision of Rs. 225 crores.
** Includes provision for Hill and Tribal Areas. @ Includes provision for Nutrition. # Excludes expenditure on Nutritions (Rs. 3.7 crores).
□ Relates to Science and Technology.

Key : 1 = Expenditure; 2 = percentage to total; 1* = Outlay.

Source : Basic Statistics relating to the Indian Economy 1950-51 to 1975-76, *Central Statistical Organisation.*

Table 3.4 : WORLD IMPORTS (C.I.F.)

(Values in U.S. million dollars)
(Figures in brackets are percentages to world total imports)

Region, Country or Area	1938	1948	1958	1963	1968	1969	1970	1971	1972	1973	1974	1975
1.World[1,2]	25400	63500	114500	162900	252500	286800	328900	365700	430300	591100	853100	903200
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)
2. Developed Market Economics[2]	17900	41200	74100	111100	179400	206300	237800	264700	312600	430400	612100	614300
	(70.47)	(64.88)	(64.72)	(68.20)	(71.05)	(71.93)	(72.30)	(72.38)	(72.65)	(72.81)	(71.75)	(68.01)
3. Developing Market Economics	5800	18600	27600	32700	45400	50100	56400	63500	71800	98700	163200	189300
	(22.83)	(29.29)	(24.10)	(20.07)	(17.98)	(17.47)	(17.15)	(17.36)	(16.69)	(16.70)	(19.13)	(20.96)
4. Of which OPEC[3]	800	2600	5400	4700	7800	8900	9900	11500	14100	20500	34500	54800
	(3.15)	(4.09)	(4.72)	(2.89)	(3.09)	(3.10)	(3.01)	(3.14)	(3.28)	(3.47)	(4.04)	(6.07)
5. Centrally Planned Economics	1700	3700	12800	19100	27700	30400	34700	37500	45900	62000	77800	99600
	(6.69)	(5.83)	(11.18)	(11.72)	(10.97)	(10.60)	(10.55)	(10.25)	(10.67)	(10.49)	(9.12)	(11.03)
6. India[4]	576	1725	1844	2477	2571	2217	2124	2421	2226	3210	5175	6362
	(2.27)	(2.72)	(1.61)	(1.52)	(1.02)	(0.77)	(0.65)	(0.66)	(0.52)	(0.54)	(0.61)	(0.70)

Notes: 1 Excluding trade among each of the following countries: China, Mongolia, Democratic Peoples' Republic of Korea, and former Democratic Republic of Vietnam.

2 Including trade between the Federal Republic of Germany and German Democratic Republic.

3 Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libyan Arab Republic, Nigeria, Qatar, Saudi Arabia, United Arab Emirates and Venezuela.

4 In 1938, data for Bangladesh and Pakistan are included with India.

Source : *Statistical Yearbook 1976*, United Nations.

Table 3.5 : WORLD EXPORTS (F.O.B.)

(Values in U.S. million dollars)
(Figures in brackets are percentages to world total)

Region, Country or Area	1938	1948	1958	1963	1968	1969	1970	1971	1972	1973	1974	1975
1.World[1,2]	22700	57500	108600	154500	239700	273600	313200	350600	416100	576800	835800	871300
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)
2. Developed Market Economics[2]	15100	36600	71400	104100	168800	194700	224900	252100	298700	408500	543600	578600
	(66.52)	(63.65)	(65.75)	(67.38)	(70.42)	(71.16)	(71.81)	(71.91)	(71.79)	(70.82)	(65.04)	(66.41)
3. Developing Market Economics	6000	17200	24900	31500	43600	48800	54900	62100	74200	110500	220300	207200
	(26.43)	(29.91)	(22.93)	(20.39)	(18.19)	(17.84)	(17.53)	(17.71)	(19.83)	(29.16)	(26.36)	(23.78)
4. Of which OPEC[3]	1000	3100	7400	9400	14000	15200	17500	23100	27400	42200	121000	112100
	(4.41)	(5.39)	(6.81)	(6.08)	(5.84)	(5.56)	(5.59)	(6.59)	(6.58)	(7.32)	(14.48)	(12.87)
5. Centrally Planned Economics[1]	1600	3700	12300	18900	27300	30100	33400	36400	43200	57800	71900	85500
	(7.05)	(6.43)	(11.33)	(12.23)	(11.39)	(11.00)	(10.66)	(10.38)	(10.38)	(10.02)	(8.60)	(9.81)
6. India[4]	614	1387	1222	1626	1761	1835	2026	2034	2433	2933	3930	4371
	(2.70)	(2.41)	(1.13)	(1.05)	(0.73)	(0.67)	(0.64)	(0.58)	(0.58)	(0.51)	(0.47)	(0.50)

Notes : 1 Excluding trade among each of the following countries: China, Mongolia, Democratic Peoples' Republic of Korea, and former Democratic Republic of Vietnam.

2 Including trade between the Federal Republic of Germany and German Democratic Republic.

3 Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libyan Arab Republic, Nigeria, Qatar, Saudi Arabia, United Arab Emirates and Venezuela.

4 In 1938, data for Bangladesh and Pakistan are included with India.

Source : *Statistical Yearbook 1976*, United Nations.

Table 3.6 : COMPOSITION OF INDIA'S IMPORTS

A—Rs. in Crores—Post Devaluation.
B—Per cent share in total.

Sr. No.	*Group*	1950-51		1955-56		1960-61		1965-66		1968-69		1973-74	
		A	B	A	B	A	B	A	B	A	B	A	B
1.	Cereals and cereal preparations	149.4	14.6	27.0	2.5	285.9	16.2	487.2	22.3	336.6	17.6	352.6	12.1
2.	Industrial raw materials	431.5	42.0	380.7	35.8	496.7	28.0	488.7	22.4	625.9	32.8	1060.9	36.4
3.	Metals	65.5	6.4	95.8	12.8	267.8	15.1	262.2	11.9	175.2	9.1	380.5	13.0
4.	Capital goods	225.4	22.0	327.8	30.8	560.9	31.8	799.9	36.7	527.9	27.7	650.5	22.3
5.	Manufactured goods except metals and metal manufactures	56.1	5.4	75.6	7.0	65.2	3.7	49.4	2.3	61.7	3.3	128.7	4.4
6.	Others	98.3	9.6	117.1	11.1	91.2	5.2	106.4	4.4	181.3	9.5	343.2	11.8
Total Imports (1-6)		1026.2	100.0	1064.1	100.0	1767.7	100.0	2193.8	100.0	1908.6	100.0	2916.4	100.0

Source : *Economic Times Annual*, 1975, p. 149.

Table 3.7 : COMPOSITION OF INDIA'S EXPORTS

A—Rs. in Crores—Post Devaluation.
B—Per cent share in total.

Sr. No.	*Group*	1950-51		1955-56		1960-61		1965-66		1968-69		1973-74	
		A	B	A	B	A	B	A	B	A	B	A	B
1.	Food and live animals	193.7	20.6	251.7	27.0	312.5	31.3	379.6	30.0	364.1	26.8	666.4	26.8
2.	Beverages and tobacco	29.1	3.1	18.8	2.0	24.7	2.5	34.4	2.7	33.8	2.5	71.0	2.8
3.	Crude materials, inedible	152.1	16.2	189.5	20.3	176.3	17.7	212.7	16.8	212.0	15.6	356.5	14.4
4.	Minerals, fuels, etc.	9.2	1.0	12.9	1.4	11.7	1.2	14.7	1.2	12.1	0.9	15.3	0.6
5.	Animal and vegetable oils and fats	39.9	4.2	57.1	6.1	15.4	1.6	7.2	0.6	11.9	0.9	31.3	1.3
6.	Chemicals	9.3	1.0	10.9	1.2	11.2	1.1	17.5	1.4	23.7	1.7	57.0	2.3
7.	Manufactured goods	475.8	50.5	378.6	41.3	439.8	44.1	591.4	46.8	694.3	51.2	988.3	39.8
8.	Others	32.2	3.4	11.8	1.3	5.1	0.5	6.6	0.5	5.5	0.4	297.4	12.0
	Total Exports (1-8)	941.3	100.0	931.3	100.0	996.7	100.0	1264.1	100.0	1357.4	100.0	2483.2	100.0

Source : *Economic Times Annual*, 1975, p. 149.

Table 3.8 : PLAN-WISE ALLOCATION OF INVESTIBLE RESOURCES BETWEEN AGRICULTURE AND INDUSTRY

(in per cent)

	Agriculture sector	*Industry sector*	*Others*	*Total*
First Plan	37.0	36.8	26.2	100
Second Plan	20.9	51.8	28.3	100
Third Plan	20.5	59.3	20.2	100
Annual Plans	23.8	59.5	16.7	100
Fourth Plan	23.3	56.3	20.4	100
Fifth Plan	20.5	61.3*	18.2	100

Source : Prepared from table 3.3

* Figures for Village and Small Industries are clubbed with Industry and Minerals. This may account for the slight rise. (see foot-note 2.)

Total 3.9 : OVERALL TRADE -DEPENDENCE RATIOS 1950-51 to 1974-75

Year	*Imports as percentage to GNP*	*Exports as percentage to GNP*	*Year*	*Imports as percentage to GNP*	*Exports as percentage to GNP*
1950-51	10.8	10.0	1963-64	6.2	4.0
1951-52	13.7	11.0	1964-65	5.9	3.4
1952-53	10.2	8.9	1965-66	5.9	3.4
1953-54	8.1	7.7	1966-67	7.6	4.2
1954-55	10.2	9.4	1967-68	6.2	3.7
1955-56	11.8	8.9	1968-69	5.8	4.1
1956-57	7.7	5.3	1969-70	4.7	4.2
1957-58	8.6	5.3	1970-71	4.4	4.2
1958-59	6.8	4.3	1971-72	4.7	4.1
1959-60	7.0	4.6	1972-73	4.4	4.7
1960-61	7.5	4.3	1973-74	5.7	4.8
1961-62	6.9	4.2	1974-75	7.1	5.3
1962-63	6.6	4.0			

Source : *Economic Times Annual* 1977, p. 159.

CHAPTER IV

AN ANALYSIS OF STRUCTURAL CHANGE IN INDUSTRIAL PRODUCTION AND INDUSTRIAL IMPORTS

The bulk of India's developmental effort during the last twenty-five years has been directed toward the achievement of industrial transformation as envisaged in the Five Year Plans. The industrial sector is still small in relation to the size of the Indian economy. However, we have seen in Chapter III, that in terms of allocation of resources, both from public and private sources, this sector has received and continues to receive, a disproportionately[1] large amount of attention. This sector is the focal point of major economic policies.

The pattern of industrial growth in India, as in other industrialised countries, has shown a strong bias in favour of the production of chemicals, metals and metal products, machinery and transport equipment. Little is known beyond this as a detailed study of structural change in neither industrial production nor India's industrial imports, exists. So, not much is known about the import-dependence[2] of India's manufacturing sector and the overall import-dependence of the Indian economy beyond the conventional summary measure, i.e., the ratio of imports to national income.

Ideally, such a study ought to have been carried out in an input-output framework. This kind of study, however, is not possible in the Indian context as our imports are not classified by use. It is true that the 'Technical Note on the Approach to the Fifth Plan' gives two import-coefficient matrices. However, the authors of the plan have been so reticent about how thay obtained the matrices that it is difficult to place much confidence in their coefficients.

The Correspondence between Trade and Industrial Classifications

As mentioned earlier we have employed the correspondence between industrial and trade classifications worked out by Argade and Pitre.[3] Imports have been reclassified according to the categories of the ASI manufacturing sector which covers groups 20-39 and 51. This means that the imports of crude materials, like crude petroleum and metal ores, fall outside the limits of this exercise. Since such materials are used as inputs in the manufacturing sector

their omission results in an underestimation of the import-dependence of the manufacturing sector.

On Data Used

Production values pertain to the Census sector of the ASI *(Annual Survey of Industry)* and are at producers', ex-factory, current prices. Import values are current, c.i.f. values. Quantity indices of industrial production (obtained from *"The Monthly Statistics of the Production of Selected Industries of India")* and of industrial imports (constructed by V. Pitre) were used to convert current production and import values into corresponding constant values.

On the (Non-Adjustment for the 1966 Devaluation)

Strictly speaking pre- and post-devaluation values of imports are not comparable. Converting import-values into another currency (say, dollars) is one way of assuring comparability. However, most of our analysis in this chapter is concerned with percentage shares of imports of particular groups in total imports. The suggested adjustment for comparability would imply dividing both numerator and denominator by the same factor. The whole exercise would be quite superfluous and so we have not carried it out.

An Overview

Industrial production has grown at a faster rate than industrial imports. Over the period 1960-75 industrial production registered a real increase of 112 per cent whereas industrial imports increased in real terms by just 22 per cent.[4] This suggests a decline in import-dependence.

The Hoffman Ratio

W. G. Hoffman has defined four distinct stages of industrialisation in terms of the ratio of the net output of consumer goods industries to that of capital goods industries.[5] In the first stage of industrialisation the consumer goods industries are dominant and the Hoffman ratio is around five. In the second stage the ratio is in the range of 2.5 to 1, while in the third stage the net outputs of the two groups are approximately equal. In the fourth stage the capital goods industries spurt ahead rapidly leaving the consumer goods industries far behind.

This ratio is relevant for a free economy with the 19th century pattern of development, particularly the pattern of U.K. In the context of India, where conscious efforts were directed towards industrialization with infrastructural linkages, it would imply a rapid decline in the Hoffman ratio. This is exactly what has happened. The ratio fell from 15.47 in 1946 to 7.97 in 1955 and to 2.52 in 1965. But over 1965-75 it is almost stable; from 2.52 in 1965 it has declined to 2.08 in 1975.[6] This means it has not reversed in favour of capital goods in later years.

This may have happened for two reasons*:

(i) Once a country has emerged from colonial fetters and exhausted its sterling balances in consumption imports, local consumption has to be maintained at

* The authors are grateful to the anonymous reteree for suggesting these conjectures.

some minimum level. India's population and size dictate a minimum level of consumption, necessitating domestic production of simple consumption goods, sometimes at the cost of exports. So the ratio stays constant.

(ii) The ratio can stay constant because the supply of capital goods proceeds at the same rate as the supply of consumer goods which means the process of heavy industry type industrialization can go on alongside the growth of consumer goods industries. This explanation verified against the facts looks untenable because organised consumer industries have not grown as fast as non-consumer goods industries. We feel that the ratio has remained largely unchanged because the capital goods industries have not grown as fast as they grew in the late fifties and the early sixties.

Despite its many limitations the Hoffman ratio is a useful summary measure that reflects the growing importance of capital goods industries with the growing industrialization of a country.

The Gini-Hirschman Co-efficient of Concentration

The Gini-Hirschman coefficient of concentration[7] is a *direct* function of the relative inequality of distribution or dispersion and an *inverse* function of the number of elements in the series.

If $a_1, a_2, \ldots a_k, \ldots, a_n$ are the size of the categories of a statistical series, and if we have

$$\sum_1^n a_k = A \quad \text{then the index is}$$

$$C = \sqrt{\sum_1^n \left(\frac{a_k}{A} \cdot 100\right)^2} = \frac{100}{A}\sqrt{\sum_1^n a_k^2}$$

where $\frac{a_k}{A}$ will, therefore, be a relative share of the category concerned.

The index can take values ranging from $100\sqrt{n}$ at its lowest to 100 at its highest.

At two digit level of the ASI classification the concentration coefficient for industrial production at current prices declined from 38.90 in 1960 to 32.02 in 1975. The coefficient of concentration for industrial imports increased from 38.06 to 42.57[8].

At three digit level of the ASI classification, again at current prices, the same pattern is revealed the coefficient of concentration in production fell from 32.32 in 1960 to 25.36 in 1975; that for industrial imports rose from 35.86 in 1960 to 36.11 in 1975[9].

At constant (1960) prices and at two-digit level of the ASI classification again the same pattern is revealed, the coefficient of concentration for industrial production fell from 38.90 in 1960 to 32.16 in 1975; that for industrial imports rose from 39.51 in 1960 to 45.85 in 1975.

Thus, over the period 1960-75 industrial production has diversified whereas industrial imports have grown more concentrated.

An examination of the degree of concentration within traditional (groups 20-30 of the ASI classification) and non-traditional (groups 31-39 and 51 of the ASI classification) industries also revealed the same pattern. Further, we found

that the concentration of both industrial production and industrial imports in the traditional sector was greater than in the non-traditional sector.

Leading and Lagging Groups in Industrial Production and Industrial Imports

Single measures, which is what we have used in the preceding two sections, cannot possibly capture the varied movements of the various groups within the manufacturing sector. So, we have taken a disaggregated look at the various groups in industrial production and industrial imports. The industries were classified under the following groups—leading, lagging and constant. An industry (industrial import) is a leading one if it has increased its share in total industrial production (total industrial imports) over the period 1960-75. Lagging and constant industries (industrial imports) are defined similarly, *mutatis mutandis*. This exercise was carried out at both current and constant (1960) prices.

In what follows, we discuss the structure of industrial output and industrial imports. We make two kinds of comparisons. First, we compare the structures at 1960 and 1975 at current prices. Second, we compare them at constant prices with 1960 as the base. We then study the likely relationships between imports and industrial production. These relationships throw light on the interaction and interdependence between production and imports.

Structural Shifts in Industrial Production

(i) At current Prices

There are eight leading industries and ten lagging ones (see table 4.3). The share of the leading industries to total industrial production increased from 29.05 per cent in 1960 to 52.42 per cent in 1975 (see table 4.11). This transformation has come about mainly because some groups—Chemicals and Chemical Products (31), Petroleum and Coal products (32), Non-electrical Machinery (36), Electrical Machinery (37) and Electricity (51)[11]—have more than doubled their shares in total production. Another major group—Basic Metal Industries (34)—recorded a slight increase in its share from 9.74 per cent to 10.57 per cent of total industrial production (see, table 4.1). As a result, the share of the lagging industries has fallen from 71 per cent in 1960 to 47.58 per cent in 1975 (see, table 4.13). Among the groups which suffered sharp declines in their shares in total industrial production were Food and Beverages (20-21) Textiles (23) and Transport Equipment (38). All this change—except for the behaviour of Transport Equipment (38)—is in line with the general experience of industrialised countries (see table 4.3.b).

(ii) At Constant Prices

The picture changes substantially when the price effect is eliminated. It contains seven industries out of eight in the above group and receives four new members from the lagging group. The number of leading industries thus, increases to eleven and that of lagging industries falls to seven. Wood and Cork

(25), Rubber Products (30), Non-metallic Mineral Products (33) and Metal Products except Machinery and Transport Equipment (35) are the additions to the set of leading industries. On the other hand, Footwear and Apparel (24) moves to the group of lagging industries (see table 4.6). This shift shows in the case of the former group of industries the volume growth is more prominent. One possible cause for such a movement could be technological progress with its consequent (and well-known) effects on unit costs and production. On the other hand, relative prices must have moved in favour of Footwear and Apparel (24) resulting in a higher value-and lower volume-share. These 'movers' made additional contributions of 8.06 per cent in 1960 and 9.94 per cent in 1975 to the real share of the leading groups to total industrial production (see table 4.1). The real share of the leading group in total industrial production increased from 37.11 per cent to 58.11 per cent over the period 1960-75 (see table 4.12). Since the real share of the new entrants has moved up only from 8.06 per cent to 9.14 per cent over 1960-75, the increase in the real share has mainly come from the industries that were leading at both current and constant prices. These were Chemicals and Chemical Products (31), Petroleum and Coal Products (32), Basic Metal Industries (34), Non-electrical Machinery (37) and Electricity (51) and these constituted the 'core sector' wherein more than average growth was concentrated (see table 4.1).

The lagging industries at current prices suffered a decline from 70.95 per cent in 1960 to 47.58 per cent in 1975 (see table 4.11). At constant prices this change has been reinforced, as noted above, by a shift of a few industries moving over to the leading group. Their share thus, fell from 62.89 per cent in 1960 to 40.89 per cent (see table 4.12). The most important of the lagging industries at constant prices are Food and Beverages (20-21), Textiles (23) and Transport Equipment (38).

Structural Shifts in Industrial Imports

(i) At Current Prices

There were only four leading industrial imports as opposed to eleven lagging ones. The share of the leading groups in total imports rose from 36.22 per cent in 1960 to 59.28 per cent in 1975 (see table 4.13). Two of the leading groups—Chemicals and Chemical Products (31) and Basic Metals (34)—alone accounted for 32.39 per cent of total industrial imports in 1960 and 53.06 per cent of total industrial imports in 1975 (see table 4.2). The share of the lagging industrial imports in total industrial imports declined from 63.78 per cent to 40.72 per cent (see table 4.13). The prominent ones among the lagging industrial imports are Food and Beverages (20-21), Textiles (23), Petroleum and Coal Products (32), Metal Products except Machinery and Transport Equipment (35),Electrical Machinery (37), Non-electrical Machinery (36) and Transport Equipment (38). The sharpest of declines, of more than half in some cases, have been recorded by Textiles (23), Metal Products except Machinery and Transport Equipment (36) and Transport Equipment (38) (see table 4.2).

(ii) At Constant Prices (Table 4.7)

The picture changes when viewed at constant prices. The number of *leading industrial imports* increases to five and that of lagging industrial imports declines to ten. Again we have some 'movers'—Food and Beverages (20-21), Petroleum and Coal Products (32) and Electrical Machinery (37) more over to the leading category; Basic Metals (34) and Miscellaneous Manufacturing Industries (39) move to the lagging category (see table 4.4). The share of the leading industrial imports in total industrial imports increased from 34.98 per cent in 1960 to 73.34 per cent in 1975 (see table 4.14). Among the leading industrial imports Chemicals and Chemical Products (31), Food and Beverages (20-21), Petroleum and Coal Products (32) and Electrical Machinery (37) are important. The share of the lagging industrial imports declines from 65.02 per cent in 1960 to 26.66 per cent in 1975 (see table 4.12). Among the lagging industrial imports Non-electrical Machinery (36), Transport Equipment (38) and Basic Metals (34) play a decisive role (see table 4.7.b).

Overlaps

A study of the overlaps among some of the groups defined above helps us find some interrelations among them.

(i) Overlap of Leading Industries and Leading Industrial Imports

At current prices (see table 4.5.a), this set consists of Paper and Paper Products (27), Chemical and Chemical Products (31) and Basic Metals (34). Of total industrial imports they contributed 34.88 per cent in 1960 and 55.76 per cent in 1975; of total industrial production they contributed 19.27 per cent in 1960 and 29.08 per cent in 1975 (see table 4.5.b).

On the constant price basis (see table 4.8.a) this set consists of Paper and Paper Products (27), Chemical and Chemical Products (31), Petroleum and Coal Products (32) and Electrical Machinery (37). Of total industrial imports, they contributed 29.27 per cent in 1960 and 66.98 per cent in 1975; of total industrial production, they contributed 14.24 per cent in 1060 and 23.27 per cent in 1975 (see table 4.8.b).

These magnitudes indicate that the pull of these products on imports is more powerful than on industrial production. This outcome can be explained by the fact that many of these products experience a sharp increase in demand due to inter-industry linkages. These products are in the nature of infrastructural intermediate inputs. This means the forces of import substitution are strong somewhere else in the economy where output is being produced to serve the domestic market. In other words, imports and production in these industries constitute a set of imports in the process of production of the variety of other goods. The demand for these goods, therefore, must be expanding so rapidly that even an expanding domestic production is unable to satisfy it. Some portion of the output and imports of these industries must also be entering into these industries as inputs as well. The other reason for the pull on imports, namely, the increase in demand due to the rise in incomes does not seem to be a major

influence here because no final goods or semi-processed consumer goods appear in the list of imports given above, though indirect influence via final goods might be influencing the degree of import-dependence.

(ii) Overlap of Lagging Industries and Lagging Industrial Imports

On the current price basis (see table 4.5.c) this set was a fairly large one. It consisted of Food and Beverages (20-21), Textiles (23), Wood and Cork (25), Leather and Leather products (29), Rubber Products (30), Non-metallic Mineral Products (33), Metal Products except Machinery and Transport Equipment (35) and Transport Equipment (38). The share of this group in total industrial production was 67.55 per cent in 1960 and 45.57 per cent in 1975; their share in total industrial imports was 23.22 per cent in 1960 and 11.44 per cent in 1975 (see table 4.5.d).

At constant prices (see table 4.8.c), the set consists of only four groups Textiles (23), Leather and Leather Products (29), Transport Equipment (38) and Miscellaneous Manufacturing Industries (39). Their share in total industrial production was 38.99 per cent in 1960 and 22.46 per cent in 1975; their share in total industrial imports was 14.53 per cent in 1960 and 5.15 per cent in 1975 (see table 4.8.d).

These magnitudes given here show that these industries exert a comparatively weak pull on imports. The product-groups appearing here belong to two groups. On one hand, we have traditional industries like Textiles (23), Leather and Leather Products (29), Wood and Cork (25), Non-metallic Mineral Products (33) and Rubber Products (30). These industries exert a negligible pull on imports. In 1960, these products constituted 6 per cent of the total industrial imports while in 1975 the percentage came down to 2 per cent; but their share in industrial production was 35.70 per cent in 1960 and 23.32 per cent in 1975 on the constant price-basis. As against this, we have under this class, product groups of transport equipment (38) and miscellaneous industries (39). Their import pull is not as negligible as the traditional industries listed above. Their import-share in 1960 was 10.12 per cent which declined to 8.32 per cent in 1975 at current prices and to 3.29 per cent at constant prices. One reason for the declining import pull of this class of industries is their high-degree of self-sufficiency in serving the domestic market. It implies that the degree of import substitution in these industries is very high. There are also industries which do not indicate any high inter-industry linkages (i.e. infrastructural linkages) except perhaps transport equipment (38).

The demand for these goods must have grown at a less-than-average rate, which is why their shares in total industrial production and total industrial imports have actually fallen.

(iii) Overlap of Leading Industries and Lagging Industrial Imports

On the current price (table 4.9) basis there were three industries in this set—Petroleum and Coal Products (32), Non-electrical Machinery (36) and Electrical Machinery (37). Their share in production went up from 7.28 per cent in 1960 to 17.17 per cent in 1975 while their share in imports declined from 40.53 per cent in

1960 to 29.26 per cent in 1975. On ranking industries, by the ratio of import-substitution to change in production (in descending order), we find that it is these very groups that top the list.

On the constant price (table 4.10) basis we have six industries in this set—Wood and Cork (25), Rubber Products (30), Non-metalic Mineral Products (33), Basic Metals (34), Metal Products except Machinery and Transport Equipment (35) and Non-electrical Machinery (36). The last three of the above set have high ratios of import-substitution to change in production, the remaining three traditional industries are comparatively unimportant .The share of the entire set in industrial production rose from 20.51 per cent in 1960 to 29.39 per cent in 1975 while the share in total industrial imports fell from 50.49 per cent in 1960 to 21.51 per cent in 1975.

These magnitudes throw light on the vigorous process of import substitution shared by Basic Metals (34), Metal Products (35) and Non-electrical Machinery (36). The real production share of these industries has gone up from 15.44 per cent in 1960 to 21.61 per cent in 1975 and the import share declined from 48.88 per cent in 1960 to 20.60 per cent in 1975. This means the remaining traditional industries in this group exerted a very negligible pull of 2 per cent on imports with their production share going up from 5 per cent to 8 per cent.

The other important feature of the magnitudes is that the import share of 2 per cent and above means the imports of these products may be of infrastructural character so that the own as well as the inter-industry demand enforces relatively high level of imports.

(iv) Overlap of Lagging Industries and Leading Industrial Imports

On the current price basis the set consists of just one member—Miscellaneous Manufacturing Industries (39)—whose share in total industrial production falls from 0.82 per cent in 1960 to 0.53 per cent in 1975 and whose share in total industrial imports rises from 1.54 per cent in 1960 to 3.52 per cent in 1975.

On the constant price basis the set again consisted of one member—Food and Beverages (20-21). The share of this group in total industrial production fell from 21.18 per cent in 1960 to 16.97 per cent in 1975 while its share in total industrial imports rose from 5.68 per cent in 1960 to 6.36 per cent in 1975.

The discovery that Food and Beverages (20-21) is an industry exercising a strong and growing influence on imports reveals how tight import controls on the import of consumer goods fail to effect any curtailment of non-essential items of consumer goods under this category. This is an important case where the influence of rising demand coming from the upper income brackets was recognised by the control authorities.

Analysis of 3-digit level data

In the course of our study we collected the 3-digit level data on industrial production and corresponding industrial imports for 1960 and 1975. But for want of proper price deflators, we could not reduce this data to constant prices but an examination of these data throws abundant light on the pattern of

economic growth as well as its distributional implications. It is true that the picture at current prices does introduce some element of unreality in the pattern of growth because in some cases, as we have seen before, the volume growth and the value growth may not be unidirectional. Even then, some important industries that are leading on the current price-basis constitute that important set of industries in the public and private sectors which have received favoured treatment from the Planning Commission and other policy bodies in the matter of allocation of investible resources, credit and requisite imported inputs. Likewise, there are some others that belong to the private sector which attract resources to themselves due to their high profitability. This conjecture is based on the data containing in tables 4.15, 4.16, 4.17 and 4.18.

A glance at these tables reveals, as expected, the prominent role played by high-priority industries like paper and paper-products, basic industrial chemicals, paints and varnishes, chemical products, petroleum refining, petroleum & coal products, iron and steel, electrical machinery, non-electrical machinery and power generation. But these tables also show a number of consumer goods industries which have grown on the basis of current prices. Their relative importance is small but their appearance is revealed only at 3-digit level. They include industries like dairy products, canned fruits and vegetables, bakery products, cocoa, chocolate & confectionery, wines, breweries, soft drinks, footwear, knitted products, vegetable oils, watches and clocks. Some output of glass and glass products and paints and varnishes is also meant for final consumption. This means that this set of industries must have expanded under the stimulus of the widening of domestic market for these products. One possible explanation behind this may be the demand pattern of the middle and high income groups which have experienced substantial increases in their real incomes. This shift can be traced to the growth of military and administrative bureaucracy in the Government & Semi-government sectors and the growth of technocracy in the industrial sector. The viable middle class seems to have taken firm roots. It is no wonder, therefore, that the pattern of demand of this class has shaped the pattern of final output in the newly emerging set of consumer goods industries.

A list of declining industries at 3-digit level contains big consumer goods industries like textiles, grain mill products, sugar, tobacco, miscellaneous food preparations, pottery and clay products, motor vehicles, motor cycles and bicycles and jewellery. But it also contains many intermediate goods industries like rubber products, cement, leather tanning and finishing, non-ferrous metals, metal products, non-metalic products. It is clear that these industries are relatively losing ground to basic and key industries as also to new consumer goods industries.

A look at the compostion of imports shows how the structural changes in production derive support from the structural changes in imports. Among the leading and constant imports we have a number of products which are in the nature of the infrastructural kind. Imports of paper and paper products, chemicals and fertilisers, chemical products, iron and steel, professional and scientific equipment fall in the leading category. Imports of dairy products, vegetable oils, furniture items and sugar products are the only leading consumer goods items.

Dairy products figure prominently here and again it looks as if the demand from higher income-groups outweighs the domestic supply. The growth of tourism and inter-continental hotel industry seems to have further exercised a powerful pull on such imports. A look at the list of constant industrial imports reveals how imports of many luxury items were permitted despite controls. This list consists of canned fish and sea foods, bakery products, cocoa, chocolate and confectionary, wines, breweries, soft drinks, cigars and cigarrets, knitted products, pottery products, footwear and wearing apparels. This means the domestic production of these items turned out to be inadequate and imports were allowed, though, in relative terms, small. Once again this important piece of information throws light on the quality of growth, the pattern of consumption it has encouraged and the income-distribution it has given rise to.

A list of declining imports belongs to those industry groups where import substitution was prominent. Textiles, grain mill products, canned and preserved fruits, miscellaneous food preparations, paints and varnishes, petroleum refining, electrical and non-electrical machinery, motor vehicles, and railroad equipment figure prominently here. Traditional industries exert a weaker pull on imports than basic industries like machinery, transport equipment, nonferrous metal, railroad equipment and motor vehicles. Thus it is clear that the planning in the direction of heavy and machine building industry did have a powerful impact on the pattern of output and imports.

Conclusion

It is clear from our exercise that rapid and dramatic changes have occurred in the structures of industrial production and imports during 1960-75. Our 2-digit level study throws light on these changes but our 3-digit level data throws light on the behaviour of consumer vs. capital/intermediate goods industries. We have concluded that these changes lend an indirect support to the hypothesis that a skewed income distribution favouring the middle and upper income groups has tilted the pattern output in favour of upper income brackets. It is also important to underline the fact that our exercise clearly shows that the planners have succeeded in giving a push to the economy in the direction of metals, chemicals and machine based industry but have in the process encouraged only those consumer goods industries which experience high profitability.

NOTE A

An analysis of Leading, Lagging and Constant Industries and Industrial Imports—with both Industrial Production and Industrial Imports— measured at Current Prices. The analysis is at the two digit level of the ASI classification.

	Total Industrial Production (Rs. in crores)	*Total Industrial Imports (Rs. in crores)*
1960	3210.3713	806.5848
1975	21110.3100	2547.4904

An industry or industrial import is defined as "insignificant" if it contributes less than 0.5 per cent of the value of total industrial production or total industrial imports respectively in both 1960 and 1975. The actual values (Rs. in crores) for this proportion are given below.

	Industrial Production (Rs. in crores)	*Industrial Imports (Rs. in crores)*
1960	16.0519	4.0329
1975	105.5516	12.7375

The ASI code numbers of the "insignificant" groups in industrial production and industrial imports are underlined in the following tables. The figure of 0.5 per cent is no doubt arbitrary but one has to draw the line somewhere. If 0.1 per cent were taken as the relevant figure one would be left with no "insignificant" group, as it is we are left with precious few.
The actual percentages are given below the ASI code numbers, the first being for 1960 and the second for 1975.
Since the entire analysis is in terms of shares one need not correct for the effect of the 1966 devaluation.

NOTE B

An Analysis of Leading, Lagging and Constant Industries and Industrial Imports—with both Industrial Production and Industrial Imports—measured at Constant (1960) Prices. The analysis is at the two digit level of the ASI classification.

	Total Industrial Production (Rs. in crores) at 1960 Prices	*Total Industrial Imports (Rs. in crores) at 1960 Prices*
1960	3210.3713	806.5848
1975	6829.3391	991.9059

An industry or industrial import is defined as "insignificant" if it contributes less than 0.5 per cent of the value of total industrial production or total industrial imports respectively in both 1960 and 1975. The actual values (Rs. in crores) for this proportion are given below.

	Industrial Production (Rs. in crores) at 1960 Prices	*Industrial Imports (Rs. in crores) at 1960 Prices*
1960	16.0519	4.0329
1975	34.1467	4.9595

The ASI code numbers of the "insignificant" groups in industrial production and industrial imports are underlined in the following tables. The figure of 0.5 per cent is no doubt arbitrary but one has to draw the line somewhere. If 0.1 per

cent were taken as the relevant figure one would be left with no "insignificant" group, as it is we are left with precious few.
The actual percentages are given below the ASI code numbers, the first being for 1960 and the second for 1975.
Since the entire analysis is in terms of shares one need not correct for the effect of the 1966 devaluation.

References

1. The word "disproportionately" is used in a purely statistical sense—the proportional contribution of the industrial sector to GNP is far less than the proportion of Plan expenditure allocated to it. No value-judgement is to be read into the word "disproportionately".
2. The notion of import-dependence examined here is narrow in scope and refers exclusively to annual industrial import flows and industrial production.
3. L. Argade and V. Pitre, "A Note on Industrial and Trade Classification," *Artha Vijnana*, Vol. XX, No. 3, September 1978, pp. 306-317.
4. Both rates of growth are obtained from quantity indices.
5. W.G. Hoffman, *"The Growth of Industrial Economics,"* Manchester University Press, 1958.
6. The Census of Manufactures India (C.M.I.) reports only on 29 of 63 industry groups. This may partly account for the unusually high Hoffman ratios in 1946 and 1955.
7. A.O. Hirschman, *"National Power and the Structure of Foreign Trade,"* University of California Press, 1945; Appendix A, pp. 157-160.
8. There are 21 elements (groups) in this series—so the minimum value of the concentration coefficient is

$$100/\sqrt{21} = 21.83.$$

9. There are 57 elements in this series—so the minimum value of the concentration coefficient is

$$100/\sqrt{57} = 13.26.$$

10. There are 18 elements in this series— so the minimum value of the concentration coefficient is

$$100/\sqrt{18} = 23.58.$$

11. The numbers in brackets are the ASI Code Numbers (at two-digit level of classification).

Table 4.1 : INDUSTRIAL PRODUCTION

(All figures below are percentage shares in total industrial production)

ASI Code No.	*Name of the Industry Group*	*Share in 1960*	*Share in 1975*	
			At current prices	*At constant prices*
(A)	*Leading industries BOTH at current and constant prices*			
27	Paper & Paper Products	2.01	2.32	2.24
31	Chemicals & Chemical Products	7.52	16.19	11.97
32	Petroleum & Coal Products	1.59	5.73	2.66
34	Basic Metals	9.74	10.57	11.88
36	Non-electrical Machinery	2.57	5.73	7.48
37	Electrical Machinery	3.12	5.71	6.40
51	Electricity	2.36	5.95	5.45
(B)	*Leading industries at constant prices; lagging at current prices*			
25	Wood & Cork except Furniture	0.37	0.35	0.40
30	Rubber Products	2.07	1.79	2.52
33	Non-metallic Mineral Products except Petroleum & Coal Products	3.63	2.86	3.98
35	Metal Products except Machinery & Transport Equipment	2.13	1.83	3.13
(C)	*Lagging industries BOTH at current and constant prices*			
20-21	Food & Beverages	21.18	14.38	16.97
22	Tobacco	2.58	1.48	2.37
23	Textiles	29.07	17.11	16.25
29	Leather & Fur Products except Foot-wear & Other Wearing Apparel	0.52	0.46	0.17
38	Transport Equipment	8.58	6.79	5.71
39	Miscellaneous Industries	0.82	0.53	0.33
(D)	*Lagging industries at constant prices; leading at current prices*			
24	Manufacture of Foot-wear & other Wearing Apparel & Made-up Textile Goods	0.14	0.22	0.09

Table 4.2 : INDUSTRIAL IMPORTS*

(All figures below are percentage shares in total industrial imports)

ASI Code No.	*Name of the Industry Group*	*Share in 1960*	*Share in 1975*	
			At current prices	*At constant prices*
(A)	*Leading industrial imports BOTH at current and constant prices*			
27	Paper & Paper Products	2.29	2.70	2.48
31	Chemical & Chemical Products	11.41	29.60	38.42
(B)	*Leading industrial imports at constant prices; lagging at current prices*			
20-21	Food & Beverages	5.68	3.92	6.36
32	Petroleum & Coal Products	8.61	7.80	10.23
37	Electrical Machinery	6.96	5.89	15.85
(C)	*Lagging industrial imports BOTH at current and constant prices*			
23	Textiles	4.37	0.92	1.85
25	Wood & Cork except manufacture of Furniture	0.39	0.05	0.08
29	Leather & Fur products except Foot-wear & Other Wearing Apparel	0.04	0.00	0.01
30	Rubber Products	0.45	0.25	0.34
33	Non-metallic Mineral Products except Petroleum & Coal	0.77	0.36	0.49
35	Metal Products except Machinery & Transport Equipment	2.94	1.12	1.00
36	Non-electrical Machinery	24.96	15.57	6.49
38	Transport Equipment	8.58	4.82	2.09
(D)	*Lagging industrial imports at constant prices; leading at current prices*			
34	Basic Metals	20.98	23.46	13.11
39	Miscellaneous Industries	1.54	3.52	1.20

* Industry groups 24 (Foot-wear, Other Wearing Apparel and Made-up Textile Goods) and 22 (Tobacco) are imported in so small a quantity that their percentage shares are zero. Electricity (51) is a non-traded good, except for a negligible amount of Rs. 0.0002 crores in 1965. We have omitted these groups in this exercise.

Table 4.3 : LEADING, LAGGING AND CONSTANT INDUSTRIES —ON THE BASIS OF TWO-POINT COMPARISONS OF THE PERCENTAGE DISTRIBUTION OF PRODUCTION IN THE INDIAN MANUFACTURING SECTOR (1960-75). PRODUCTION IS AT CURRENT PRICES. THE ANALYSIS IS AT THE TWO-DIGIT LEVEL OF THE ASI CLASSIFICATION.

ASI Code No.	*Name of the Industry Group*
a) Leading Industries	
24 (0.14; 0.22)	Manufacture of foot-wear, other wearing apparel and made-up textile goods
27 (2.01: 2.32)	Manufacture of paper and paper products
31 (7.52; 16.19)	Manufacture of chemicals and chemical products
32 1.59; 5.73)	Manufacture of products of petroleum and coal
34 (9.74; 10.57)	Basic Metal Industries
36 (2.57; 5.73)	Manufacture of machinery except electrical machinery
37 (3.12; 5.71)	Manufacture of electrical machinery, apparatus, appliances and supplies
51 (2.36; 5.95)	Electricity
b) Lagging industries	
20-21 (21.18; 14.38)	Manufacture of Food and Beverages
22 (2.58; 1.48)	Manufacture of tobacco
23 (29.07; 17.11)	Manufacture of textiles
25 (0.37; 0.35)	Manufactures of wood and cork except manufacture of furniture
29 (0.52; 0.46)	Manufacture of leather and fur products except foot-wear and other wearing apparel
30 (2.07; 1.79)	Manufacture of rubber products
33 (3.63; 2.86)	Manufacture of non-metallic mineral products except products of petroleum and coal
35 (2.13; 1.83)	Manufacture of metal products except machinery and transport equipment
38 (8.58; 6.79)	Manufacture of transport equipment
39 (0.82; 0.53)	Miscellaneous manufacturing industries

Notes : 1. There are no "constant" industries.

2. The figures in brackets, below the ASI code numbers, show the percentage shares of these groups in total industrial production in the years 1960 and 1975 respectively.

3. Groups 24 and 25 are "insignificant" in that they contribute less than 0.5 per cent if total industrial production in both 1960 and 1975.

Table 4.4 : LEADING, LAGGING AND CONSTANT INDUSTRIAL IMPORTS—ON THE BASIS OF TWO-POINT COMPARISONS OF THE PERCENTAGE DISTRIBUTION OF INDUSTRIAL IMPORTS IN THE INDIAN MANUFACTURING SECTOR (1960-75). IMPORTS ARE AS MEASURED AT CURRENT PRICES. THE ANALYSIS IS AT THE TWO-DIGIT LEVEL OF THE ASI CLASSIFICATION.

ASI Code No.	*Name of the Industry Group*
a) Leading industrial imports	
27 (2.29; 2.70)	Manufacture of paper and paper products
31 (11.41; 29.60)	Manufacture of chemicals and chemical products
34 (20.98; 23.46)	Basic Metal Industries
39 (1.54; 3.52)	Miscellaneous manufacturing industries
b) Lagging Industrial Imports	
20-21 (5.68; 3.92)	Manufacture of food and beverages
23 (4.37; 0.92)	Manufacture of textiles
25 (0.39; 0.05)	Manufacture of wood and cork except manufacture of furniture
29 (0.04; 0.00)	Manufacture of leather and fur products except foot-wear and other wearing apparel
30 (0.45; 0.25)	Manufacture of rubber products
32 (8.61; 7.80)	Manufacture of products of petroleum and coal
33 (0.77; 0.36)	Manufacture of non-metallic mineral products except products of petroleum and coal
35 (2.94; 1.12)	Manufacture of metal products except machinery and transport equipment
36 (24.96; 15.57)	Manufacture of machinery except electrical mechinery
37 (6.96; 5.89)	Manufacture of electrical machinery, apparatus, appliances and supplies
38 (8.58; 4.82)	Manufacture of transport equipment

Notes : 1. The figures in brackets, below the ASI code numbers, show the percentage shares of these groups in total industrial imports in the years 1960 and 1975 respectively.

2. Groups 22, 24, 25, 29 and 30 are "insignificant" in that they contribute less than 0.5 per cent of total industrial imports in both 1960 and 1975.

Table 4.5.a : OVERLAP OF TABLES 4.3.a & 4.4.a (CURRENT PRICE DATA)

Leading industries and leading industrial imports

ASI Code No.	*Name of the Industry-Group*
27	Manufacture of paper and paper products
31	Manufacture of chemicals and chemical products
34	Basic Metal Industries

Table 4.5.b : RELATIVE SHARES OF INDUSTRIAL PRODUCTION AND IMPORTS FROM TABLE 4.5.a.

(in per cent)

	1960	1975
Share of Groups 27, 31 and 34 in Total Industrial Imports	34.68	55.76
Share of Groups 27, 31 and 34 in Total Industrial Production	19.27	29.08

Table 4.5.c : OVERLAPS OF TABLES 4.3.b and 4.4.b

Lagging industries and lagging industrial imports

ASI Code No.	*Name of the Industry-Group*
20-21	Manufacture of food and beverages
23	Manufacture of textiles
25	Manufacture of wood and cork except manufacture of furniture
29*	Manufacture of leather and fur products foot-wear and other wearing apparel
30*	Manufacture of rubber products
33	Manufacture of non-metallic mineral products except products of petroleum and coal
35	Manufacture of metal products except machinery and transport equipment
38	Manufacture of transport equipment

Table 4.5.d : RELATIVE SHARES OF INDUSTRIAL PRODUCTION AND IMPORTS FROM TABLE 4.5.c.

(in per cent)

	1960	1975
Share of Groups 20-21, 23, 25, 29, 30, 33, 35 and 38 in Total Industrial Imports	23.22	11.44
Share of Groups 20-21, 23, 25, 29, 30, 33, 35 and 38 in Total Industrial Production	67.55	45.57

Notes : 1. Group 25 is "insignificant" in both production and industrial import categories.

2. Groups 29 and 30 (marked with a*) are "insignificant" as industrial imports while significant in the industrial production category.

Table 4.6 : LEADING, LAGGING AND COSTANT INDUSTRIES—ON THE BASIS OF TWO POINT COMPARISONS OF THE PERCENTAGE DISTRIBUTION OF PRODUCTION IN THE INDIAN MANUFACTURING SECTOR (1960-75). PRODUCTION IS AS MEASURED AS CONSTANT (1960) PRICES. THE ANALYSIS IS AT THE TWO-DIGIT LEVEL OF THE ASI CLASSIFICATION.

ASI Code No.	*Name of the Industry Group*
a) Leading industries	
25 (0.37; 0.40)	Manufacture of wood, cork, except manufacture of furniture
27 (2.01; 2.24)	Manufacture of paper and paper products
30 (2.07; 2.52)	Manufacture of rubber products
31 (7.52; 11.97)	Manufacture of chemicals and chemical products
32 (1.59; 2.66)	Manufacture of products of petroleum and coal
33 (3.63; 3.98)	Manufacture of non-metallic mineral products except products of petroleum and coal
34 (9.74; 11.88)	Basic Metal Industries
35 (2.13; 3.13)	Manufacture of metal products except machinery and transport equipment
36 (2.57; 7.48)	Manufacture of machinery except electrical machinery
37 (3.12; 6.40)	Manufacture of electrical machinery, apparatus, appliances and supplies
51 (2.36; 5.45)	Electricity
b) Lagging industries	
20-21 (21.18; 16.97)	Manufacture of food and beverages
22 (2.58; 2.37)	Manufacture of tobacco
23 (29.07; 16.25)	Manufacture of textiles
24 (0.14; 0.09)	Manufacture of foot-wear, other wearing apparel and made-up textile goods
29 (0.52; 0.17)	Manufacture of leather and fur products except foot-wear and other wearing apparel
38 (8.58; 5.71)	Manufacture of transport equipment
39 (0.82; 0.33)	Miscellaneous manufacturing industries

Notes : 1 There are no "constant" industries.

2. The figure in brackets below the ASI Code Numbers show the percentage shares of these groups in total industrial production in the years 1960 and 1975 respectively.

3. Groups 24 and 25 are "insignificant", in that they contribute less than 0.5 per cent of total industrial production in both 1960 and 1975.

Table 4.7 : LEADING, LAGGING AND CONSTANT INDUSTRIAL IMPORTS—ON THE BASIS OF TWO POINT COMPARISONS OF THE PERCENTAGE DISTRIBUTION OF INDUSTRIAL IMPORTS IN THE INDIAN MANUFACTURING SECTOR (1960-1975). IMPORTS ARE AS MEASURED AT CONSTANT (1960) PRICES. THE ANALYSIS IS AT THE TWO-DIGIT LEVEL OF THE ASI CLASSIFICATION.

ASI Code No.	*Name of the Industry Group*
a) Leading industrial imports	
20-21 (5.68; 6.36)	Manufacture of food and beverages
27 (2.29; 2.48)	Manufacture of paper and paper products
31 (11.41; 38.42)	Manufacture of chemicals and chemical products
32 (8.61; 10.23)	Manufacture of products of petroleum and coal
37 (6.96; 15.85)	Manufacture of electrical machinery, apparatus, appliances and supplies
b) Lagging industrial imports	
23 (4.37; 1.85)	Manufacture of textiles
25 (0.39; 0.08)	Manufacture of wood, cork except manufacture of furniture
29 (0.04; 0.01)	Manufacture of leather and fur products except foot-wear and other wearing apparel
30 (0.45; 0.34)	Manufacture of rubber products
33 (0.77; 0.49)	Manufacture of non-metallic mineral products except products of petroleum and coal
34 (20.98; 13.11)	Basic Metal Industries
35 (2.94; 1.00)	Manufacture of metal products except machinery and transport equipment
36 (24.96; 6.49)	Manufacture of machinery except electrical machinery
38 (8.58; 2.09)	Manufacture of transport equipment
39 (1.54; 1.20)	Miscellaneous manufacturing industries

Notes : 1. The figures in brackets below the ASI Code numbers show the percentage shares of these groups in total industrial imports in the years 1960 and 1975 respectively.

2. Groups 22, 24, 25, 29 and 30 are "insignificant" in that they contribute less than 0.5 per cent of total industrial imports in both 1960 and 1975.

Table 4.8.a : OVERLAP OF TABLES 4.6a AND 4.7a (CONSTANT PRICE DATA)

Leading industries and leading industrial imports

ASI Code No.	*Name of the Industry Group*
27	Manufacture of paper and paper products
31	Manufacture of chemicals and chemicl products
32	Manufacture of products of petroleum and coal
37	Manufacture of electrical machinery, apparatus, appliances and supplies

Table 4.8.b : RELATIVE SHARES OF INDUSTRIAL PRODUCTION AND IMPORTS FROM TABLE 4.5.c.

	1960	1975
Share of Groups 27, 31, 32 and 37 in Total Industrial Imports	29.27	66.98
Share of Groups 27, 31, 32 and 37 in Total Industrial Production	14.24	23.27

Table 4.8.c : OVERLAP OF TABLES 4.6.b and 4.7.b.

Lagging industries and lagging industrial imports

(at constant prices)

ASI Code No.	*Name of the Industry Group*
23	Manufacture of textiles
29*	Manufacture of leather and fur products except foot-wear and other wearing apparel
38	Manufacture of transport equipment
39	Miscellaneous manufacturing industries

Table 4.8.d : RELATIVE SHARES OF INDUSTRIAL PRODUCTION AND IMPORTS

(in per cent)

	1960	1975
Share of Groups 23, 29, 38 and 39 in Total Industrial Imports	14.53	5.15
Share of Groups 23, 29, 38 and 39 in Total Industrial Production	38.99	22.46

Notes : * Group 29 which is marked with a star (*) is "insignificant" as an industrial import while "significant" in the industrial production category.

Table 4.9 : OVERLAP OF THOSE GROUPS THAT ARE LEADING IN PRODUCTION AND LAGGING IN IMPORTS (CURRENT PRICE DATA) *i.e.* OVERLAP OF TABLES 4.3.a AND 4.4.b.

*(in per cent)**

ASI Code No.	*Name of the Industry Group*	*Increase in Production* 1960	1975	*Decline in Imports* 1960	1975
32	Manufacture of products of petroleum and coal	1.59	5.73	8.61	7.80
36	Manufacture of machinery except electrical machinery	2.57	5.73	24.96	15.57
37	Manufacture of electrical machinery, apparatus, appliances and supplies	3.12	5.71	6.96	5.89
	Total of above groups	7.28	17.17	40.53	29.26

Note : 1.* Production percentages are in relation to total industrial production whereas Import percentages are in relation to total industrial Imports

Table 4.10 : OVERLAP OF THOSE GROUPS THAT ARE LEADING IN PRODUCTION AND LAGGING IN IMPORTS (CONSTANT PRICE DATA) i.e. OVERLAP OF TABLES 4.6.a AND 4.7.b.

*(in per cent)**

ASI Code No.	*Name of the Industry Group*	*Increase in Production* 1960	1975	*Decline in Imports* 1960	1975
25	Manufacture of wood, cork except manufacture of furniture	0.37	0.40	0.39	0.08
30+	Manufacture of rubber products	2.07	2.52	0.45	0.34
33	Manufacture of non-metallic mineral products except products of petroleum and coal	3.63	3.98	0.77	0.49
34	Basic Metal Industries	9.74	11.88	20.98	13.11
35	Manufacture of Metal Products except machinery and transport equipment	2.13	3.13	2.94	1.00
36	Manufacture of machinery except electrical machinery	2.57	7.48	24.96	6.49
	Total of Above Groups	20.51	29.39	50.49	21.51

Notes : 1.* Production percentages are in relation to total industrial production whereas import percentages are in relation to total industrial imports.

2. Group 25 is "insignificant" in both production and industrial import categories since it contributes less than 0.5 per cent to the respective totals in both 1960 and 1975.

3.+ Group 30 is "insignificant" only in the industrial imports category.

Table 4.11 : SHARES OF LEADING AND LAGGING INDUSTRIES IN TOTAL INDUSTRIAL PRODUCTION* IN 1960 AND IN 1975.

(in per cent)

	1960	1975
1. Share of Leading Industries in Total Industrial Production	29.05	52.42
2. Share of Lagging Industries in Total Industrial Production	70.95	47.58
Total	100.00	100.00

* Industrial Production is as measured at *Current Prices.*

Table 4.12 : SHARES OF LEADING AND LAGGING INDUSTRIES IN TOTAL INDUSTRIAL PRODUCTION* IN 1960 AND IN 1975.

(in per cent)

	1960	1975
1. Share of Leading Industries in Total Industrial Production	37.11	58.11
2. Share of Lagging Industries in Total Industrial Prodcution	62.89	41.89
Total	100.00	100.00

* Industrial Production is as measured at *Constant (1960) Prices.*

Table 4.13 : SHARES OF LEADING, LAGGING AND CONSTANT INDUSTRIAL IMPORTS IN TOTAL INDUSTRIAL IMPORTS* IN 1960 AND IN 1975.

(in per cent)

	1960	1975
1. Share of Leading Industrial Imports in Total Industrial Imports	36.22	59.28
2. Share of Lagging Industrial Imports in Total Industrial Imports	63.75	40.70
Total	99.97	99.98

* Industrial Imports are measured at Current Prices.

Table 4.14 : SHARES OF LEADING, CONSTANT AND LAGGING INDUSTRIAL IMPORTS IN TOTAL INDUSTRIAL IMPORTS* IN 1960 AND IN 1975

(in per cent)

	1960	1975
1. Share of Leading Industrial Imports in Total Industrial Imports	34.95	73.34
2. Share of Lagging Industrial Imports in Total Industrial Imports	65.02	26.66
Total	99.97	100.00

* Industrial Imports are measured at *Constant (1960) Prices.*

NOTE C

All data used are at current prices as no price deflators are available at this level of disagrregation.

	Total Industrial Production (Rs. in crores)	*Total Industrial Imports (Rs. in crores)*
1960	3274.2048	809.5140
1975	21391.7100	2556.6335

An industry or industrial import is defined as "significant" if it contributes more than 0.5 per cent of the value of total industrial production or total industrial imports respectively in either 1960 and 1975 or both 1960 and 1975. The actual values (Rs. in Cr.) for this production are given below.

	Production (Rs. in crores)	*Imports (Rs. in crores)*
1960	16.371024	4.047570
1975	106.958550	12.7831675

The ASI code numbers of the significant industries in industrial production and industrial imports are underlined in the following tables. The actual percentages are given in brackets just below the ASI code number—the first for the year 1960 and the second for the year 1975.

The figure of 0.5 per cent of total industrial production or total industrial imports is no doubt arbitrary but one has to draw the line somewhere. If we were to fix 0.1 per cent of total industrial production or total industrial imports as the relevant figure we would be left with hardly any "insignificant" industry. Also, the figures, quoted above for production and imports are at current prices—some allowance has thus to be made for the rise in prices over the period. Since the analysis is in terms of percentage shares no adjustments have been made for the 1966 Devaluation.

Table 4.15 : LEADING, DECLINING AND CONSTANT INDUSTRIES—ON THE BASIS OF TWO POINT COMPARISONS OF THE PERCENTAGE DISTRIBUTION OF PRODUCTION* IN THE INDIAN MANUFACTURING SECTOR (1960-1975) (AT CURRENT PRICES)

ASI Code No.	*Name of the Industry*
Leading Industries	
202	Manufacture of dairy products
(0.27; 1.44)	
203	Canning and preservation of fruits and vegetables
204	Canning and preserving of fish and other seafoods
206	Manufacture of bakery products
208	Manufacture of cocoa, chocolate and sugar confectionery
211	Distilling, rectifying and blending of spirits
212	Wine industries
213	Breweries and manufacturing of malt
214	Soft drinks and corbonated water industries
232	Knitting mills
233	Cordage, rope and twine industries
241	Manufacture of foot-wear
271	Manufacture of paper and paper-products (board) and pulp
(1.96, 3.29)	
311	Basic industrial chemicals including fertilizers
(2.85, 9.23)	
312	Vegetable and animal oils and fats (except edible oils)
(0.15, 0.75)	
313	Manufacture of paints, varnishes and lacquers
(0.42, 1.26)	
319	Manufacture of miscellaneous chemical products
(3.93, 4.72)	
321	Petroleum refineries
(1.43, 4.53)	
329	Manufacture of miscellaneous products of petroleum and coal
(0.11, 1.12)	
332	Manufacture of glass and glass products
(0.48, 0.50)	
341	Iron and steel basic industries
(8.11, 9.08)	
360	Manufacture of machinery except electrical machinery
(2.51, 5.65)	
370	Manufacture of electrical machinery, apparatus, appliances
(3.05, 5.63)	and supplies
384	Repair of motor vehicles
(0.51, 0.70)	
391	Manufacture of professional and scientific measuring and controlling instruments
393	Manufacture of watches and clocks
511	Electric light and power
(2.31, 5.87)	

contd.

Table 4.15 : *(continued)*

ASI Code No.	*Name of the Industry*
Declining Industries	
205	Manufacture of grain mill products
(2.87, 0.98)	
207	Sugar factories and refineries
(5.96, 4.04)	
209	Manufacture of miscellaneous food preparations
(11.09, 6.25)	
220	Tobacco Manufacturing
(2.53, 1.46)	
231	Spinning, weaving and finishing of textiles
(26.75, 15.42)	
239	Manufacture of textiles n.e.c.
(1.61, 1.07)	
243	Manufacture of wearing apparel (except foot-wear)
280	Printing, publishing and allied industries
291	Tanneries and leather finishing plants
(0.50, 0.45)	
300	Manufacture of rubber products
(2.03, 1.78)	
331	Manufacture of structural clay products
333	Manufacture of pottery, china and earthenware
334	Manufacture of cement (hydraulic)
(1.63, 1.17)	
339	Manufacture of non-metallic mineral products n.e.c.
(0.78, 0.63)	
342	Non-ferrous basic metal industries
(1.43, 1.34)	
350	Manufacture of metal products except machinery and
(2.08, 1.80)	transport equipment
382	Manufacture of rail road equipment
(2.76, 1.31)	
383	Manufacture of motor vehicles
(3.61, 3.34)	
385	Manufacture of motor cycles and bicycles
(0.73, 0.71)	
386	Manufacture of aircraft
394	Manufacture of jewellery and related articles
399	Manufacture of industries n.e.c.
(0.53, 0.16)	
Constant Industries	
251	Saw mills, planning and other wood mills
252	Wooden and cane containers and cane small ware
259	Manufacture of cork and wood products n.e.c.
260	Manufacture of furniture and fixtures
293	Manufacture of leather products except foot-wear and other wearing apparel
381	Shipbuilding and repairing
(0.56, 0.55)	
392	Manufacture of photographic and optical goods

$$\frac{\text{*Subcategory Produciton}}{\text{Total Industrial Procution}} \times 100$$

Table 4.16 : LEADING, DECLINING AND CONSTANT INDUSTRIAL IMPORTS-ON THE BASIS OF TWO POINT COMPARISONS OF THE PERCENTAGE DISTRIBUTION OF IMPORTS* IN THE INDIAN MANUFACTURING SECTOR (1960-1975)

ASI Code No.	*Name of the Industry*
Leading Industrial Imports	
202	Manufacture of dairy products
(0.70, 0.97)	
207	Sugar factories and refineries
260	Manufacture of furnitures and fixtures
271	Manufacture of paper and paper products (board) and pulp
(2.28, 2.69)	
311	Basic industrial chemicals including fertilisers
(6.70, 24.73)	
312	Vegetable and animal oils and fats (except edible oils)
319	Manufacture of miscellaneous chemical products
(2.61, 2.99)	
341	Iron and steel basic industries
(0.23, 16.44)	
386	Manufacture of aircraft
(1.12, 1.84)	
391	Manufacture of professional and scientific measuring and
(0.70, 0.79)	controlling instruments
394	Manufacture of jewellery and related articles
(0.00, 2.09)	
Declining Industrial Imports	
203	Canning and preservation of fruits and vegetables
(0.64, 0.52)	
205	Manufacture of grainmill products
(2.28, 0.61)	
209	Manufacture of miscellaneous food preparations
(1.94, 1.71)	
211	Distilling, rectifying and blending of spirits
231	Spinning, weaving and finishing of textiles
(3.21, 0.72)	
233	Cordage, rope and twine industries
239	Manufacture of textiles n.e.c.
(1.11, 0.18)	
251	Saw mills, planing and other wood mills
259	Manufacture of cork and wood products n.e.c.
280	Printing, publishing and allied industries
293	Manufacture of leather products except foot-wear and other wearing apparel
300	Manufacture of rubber products
313	Manufacture of points, varnishes and lacquers
(1.59, 0.44)	
321	Petroleum refineries
(8.58, 7.77)	

*Subcategory imports / Total industrial imports × 100 .

contd.

Table 4.16 : *(continued)*

ASI Code No.	*Name of the Industry*
331	Manufacture of structural clay products
332	Manufacture of glass and glass products
339	Manufacture of non-metallic mineral products n.e.c.
342	Non-ferrous basic metal industries
(20.67, 6.97)	
350	Manufacture of metal products except machinery and
(2.93, 1.11)	transport equipment
360	Manufacture of machinery except electrical machinery
(24.87, 15.52)	
370	Manufacture of electrical machinery, apparatus, appliances
(6.94, 5.87)	and supplies
381	Shipbuilding and repairing
382	Manufacture of railroad equipment
(2.97, 0.99)	
383	Manufacture of motor vehicles
(4.20, 1.91)	
385	Manufacture of motor cycles and bicycles
392	Manufacture of photographic and optical goods
393	Manufacture of watches and clocks
399	Manufacture of industries n.e.c.
Constant Industrial Imports	
204	Canning and preserving of fish and other seafoods
206	Manufacture of bakery products
208	Manufacture of cocoa, chocolate and sugar confectionery
212	Wine industries
213	Breweries and manufacturing of malt
214	Soft drinks and carbonated water industries
220	Tobacco manufacturing
232	Knitting mills
241	Manufacture of foot-wear
243	Manufacture of wearing apparel (except foot-wear)
252	Wooden and cane containers and cane small ware
291	Tanneries and leather finishing plants
329	Manufacture of miscellaneous products of petroleum and coal
333	Manufacture of pottery, china and earthenware
334	Manufacture of cement (hydraulic)
384	Repair of motor vehicles
395	Manufacture of musical instruments
511	Electric light and power

Table 4.17 : OVERLAP OF TABLES 4.15 and 4.16

(at current prices)

a. Leading Industries and Leading Imports

ASI Code No.	*Name of the Industry*
202	Manufacture of dairy products
271	Manufacture of paper and paper-products (board) and pulp
311	Basic industrial chemicals including fertilizers
312	Vegetable and animal oils and fats (except edible oils)
319	Manufacture of miscellaneous chemical products
341	Iron and steel basic industries
391*	Manufacture of professional and scientific measuring and controlling instruments

b. Declining Industries and Declining Imports

ASI Code No.	*Name of the Industry*
205	Manufacture of grain mill products
209	Manufacture of miscellaneous food preparations
231	Spinning, weaving and finishing of textiles
239	Manufacture of textiles n.e.c.
280**	Printing, publishing and allied industries
300**	Manufacture of rubber products
331	Manufacture of structural clay products
339*	Manufacture of non-metallic mineral products n.e.c.
342	Non-ferrous basic metal industries
350	Manufacture of metal products except machinery and transport equipment
382	Manufacture of railroad equipment
383	Manufacture of motor vehicles
385**	Manufacture of motor cycles and bicycles
399**	Manufacture of industries n.e.c.

* Significant in imports but not in production

** Significant in production but not in imports

Table 4.18 : SHARES OF LEADING, DECLINING AND CONSTANT INDUSTRIAL IMPORTS IN TOTAL INDUSTRIAL IMPORTS

(at current prices)
(in per cent)

	1960	1975
1. Share of Leading Industrial Imports in Total Industrial Imports	14.82	53.95
a) Share of Significant Leading Industrial Imports in Total Industrial Imports	14.81	53.87
b) Share of Other Leading Industrial Imports in Total Industrial Imports	0.01	0.08
2. Share of Declining Industrial Imports in Total Industrial Imports	85.13	46.01
a) Share of Significant Declining Industrial Imports in Total Industrial Imports	82.49	44.76
b) Share of Other Declining Industrial Imports in Total Industrial Imports	2.64	1.25
3. Share of Constant Industrial Imports in Total Industrial Imports	0.06	0.04
Total	100.01	100.00

Table 4.19 : SHARES OF LEADING, DECLINING AND CONSTANT INDUSTRIES IN TOTAL INDUSTRIAL PRODUCTION

(at current prices)
(in per cent)

	1960	1975
1. Share of Leading Industries in Total Industrial Production	28.88	55.11
a) Share of Significant Leading Industries in Total Industrial Production	28.09	52.77
b) Share of Other Leading Industries in Total Industrial Production	0.79	2.34
2. Share of Declining Industries in Total Industrial Production	69.63	43.68
a) Share of Significant Declining Industries in Total Industrial Production	68.55	42.94
b) Share of Other Declining Industries in Total Industrial Production	1.08	0.74
3. Share of Constant Industries in Total Industrial Production	1.20	1.20
a) Share of Significant Constant Industries in Total Industrial Production	0.56	0.55
b) Share of Other Constant Industries in Total Industrial Production	0.64	0.65
Total	99.71	99.99

Table 4.20 : TABLE 4.17 QUANTIFIED

(at current prices)

	1960	1975
1. Overlap of Leading Industries in Industrial Production and Leading Industrial Imports		
a) Share of (1) in Total Industrial Imports	13.69	49.94
b) Share of (1) in Total Industrial Production	17.38	27.68
2. Overlap of Declining Industries in Industrial Production and Declining Industrial Imports		
a) Share of (2) in Total Industrial Imports	41.09	15.13
b) Share of (2) in Total Industrial Production	58.41	36.22
3. Overlap of Constant Industries in Industrial Production and Constant Industrial Imports		
a) Share of (3) in Total Industrial Imports	0.00	0.00
b) Share of (3) in Total Industrial Production	0.02	0.02

Table 4.21 : OVERLAP OF THOSE GOODS THAT ARE LEADING IN PRODUCTION AND DECLINING IN IMPORTS

(at current prices)

ASI Code No.	*Name of the Industry*	*Increase in Production* 1960	1975	*Decline in Imports* 1960	1975
203	Canning and preservation of fruits and vegetables	0.04	0.06	0.64	0.52
211	Distilling, rectifying and blending of spirits	0.11	0.47	0.06	0.02
233	Cordage, rope and twine industries	0.08	0.27	0.03	0.00
313	Manufacture of paints, varnishes and lacquers	0.42	1.26	1.59	0.44
321	Petroleum refineries	1.43	4.53	8.58	7.77
332	Manufacture of glass and glass products	0.48	0.50	0.17	0.13
360	Manufacture of machinery except electrical machinery	2.51	5.65	24.87	15.52
370	Manufacture of electrical machinery, apparatus, appliances and supplies	3.05	5.63	6.94	5.87
393	Manufacture of watches and clocks	0.00	0.09	0.10	0.05

CHAPTER V

INDIA'S IMPORT SUBSTITUTION 1960-75

This Chapter has been divided into two sections; the first section explains the concept of import substitution. It also examines the rationale behind import substitution as a strategy of economic development. The second section uses the usual formulas to measure the size of import substitution and presents the results.

I

Import substitution is a phrase used in a multiple sense. It has been used in the recent years to denote the process of industrialisation initiated by many less developed countries where import-competing industries take a lead over export-oriented ones. The developmental effort in the form of massive investments by the public and the private sectors aims at a departure from traditional investments in plantations and extractive industries and at accelerating the pace of development by encouraging the growth of non-traditional industries like metal-based engineering, electrical and non-electrical machinery and chemicals. This is accomplished through autonomous investment decisions carried out with consequent readjustment to trade and other economic policies and not through free play of market forces. This pattern of development is characterised by a strong anti-trade bias and the phrase "import substitution" describes this process as a whole.

This deliberate effort designed to accelerate growth by the forced transformation of the productive capacity of a country must be distinguished from the natural replacement of imports that takes place on account of unplanned economic growth induced by free play of market forces. History furnishes a number of examples where unplanned growth process show an imbalance between foreign exchange earnings and import supply rerquirements, because import coefficients of import replacement lines in terms of machinery and intermediate imports are higher than the value of imports they replace. The ratio of intermediate imports to goods domestically produced, therefore, is likely to go up in some cases. Import replacement becomes profitable at some stage and enables to redress this imbalance.[1]

Import substitution as a strategy of growth becomes a natural and attrac-

tive choice when export prospects before an economy are extremely pessimistic. It also becomes attractive when, as shown by Chenery and Strout,[2] the economy in question suffers from the trade constraint i.e. the capacity to import is limited by the inability to convert additional physical export surpluses into additional desired imports because of stagnant external demand at going prices. Given this exogeneous level of foreign exchange earnings any target rate of growth which requires high level of ex-ante imports is associated with a trade gap. As we go along higher and higher target growth rates, the trade-gap is accompanied by ex-ante savings gap as well. This calls for foreign aid policy ensuring a dose of foreign aid big enough to meet the bigger of these two ex-ante gaps. If, however, aid prospects are dim and if the aid falls short of the ex-ante trade gap, then the economy gets characterised by the trade-constrained phase of growth. Thus, this two-gap structural model of growth for a less developed country provides an intellectual underpinning behind the strategy of import-substitution.[3]

The phrase 'import substitution' has also been used to denote import substitutions at industry or sector level. Here it takes the form of replacement of existing and potential imports by output of import-competing industries. This replacement is never possible in all industries at one and the same time, because of technical and financial constraints. It, therefore, calls a discriminating choice in favour of some industries and against others. Given the level of technical competence and the size of domestic market, it is possible to rank industries according to their potential for import substitution. Given this situtation, it is further possible to find over time some industries accomplishing vigorous import substitution and others not so vigorous.

Import substitution thus provided a major impetus to industries where import substitution is feasible. The growth via import substitution implies an extension of the market for import substituting industries through the restriction of actual and potential imports. But this scope exists up to the point beyond which import/availability ratios become negligibly small, and any further decline in them turns out to be relatively unimportant. Once import substitution has run its course for some years, the process is caught in the midst of two conflicting tendencies: (a) a decrease in the ratio of imports/supplies where the import substitution is taking place and (b) an increase in the weights of the more import-intensive industries. During the initial stages, the former tendency is stronger than the latter because the import substitution covers light manufacturers like textiles, matches, soap etc. The import substitution not only reduces direct imports of competing goods but also does not involve imports of intermediate and capital goods of such large size as to offset the decline in the import-/supply ratio initiated by this import substitution process. However, as we go along to higher and higher stages of import substitution, the industries involved are those of which the dependence on imported capital and intermediate goods goes on rising. The reason for this is that the import coefficients of higher level industries are higher than lower level ones. If the foreign exchange constraint is binding, the large-scale imports of capital and maintenance imports becomes difficult. This possibility makes for economic stagnation because it prevents the growth of output at higher as well as lower levels of industry. This second stage

appears when the import-substitution penetrates into intermediate and capital goods like basic metals, chemicals, petroleum products, electrical machinery and non-electrical machinery. When some of these industries begin to serve the domestic market the output may be small and the demand may start outstripping the supply. This may happen due to two factors. Either the goods concerned may be in the nature of general input in many industries like basic metals, chemicals or fuel oils; or such goods may be characterised by high income-elasticities of demand having spill-over effect on imports. There are a number of technical, financial and resource-availability constraints which rule out adequate domestic production of such goods so that additional imports become inescapable. Many times, as in the Indian case, the planners prohibit direct import of luxury consumer goods. This results either in a large-scale smuggling in of such goods or alternatively in the policy makers allowing domestic production of such goods. The presence of smuggling makes the foreign exchange constraint more binding and the above mentioned possibility of having to restrict maintenance imports is drawn nearer, opening the spectre of economic stagnation. The Indian experience is not vastly different from what has been stated above. Through our empirical results we shall try to show how the import substitution processes in the traditional and the non-traditional industries are different, and how inter-industry demand, inter-industry linkages and infrastructural imports play a dominant role in the import substitution process in the non-traditional industries. We shall also show that though import substitution acted as an important stimulus to industrial growth in the sixties in India, it remained comparatively a less powerful force compared to domestic demand factor. In this sense India's industrial growth of the last 25 years was of endogenous variety.

This possibility that the scope for import substitution has exhausted does not mean that the economies have to face economic stagnation. This, according to Hirschman is a naive and a semi-naive view of economic development.[5] Actually infinite scope exists for economic expansion where outputs like electricity, cement, plastics, glass, paper etc. can be used as inputs in a wide range of industries. In the case of specific inputs, the scale of production can be made viable by choosing inter-linked investments. So, the results on import-substitution which tend to indicate the exhaustion of the potential of import substitution must not be taken too seriously in an economy of moderate size.[6]

II

For an in depth study of import substitution it is necessary to develop measures to quantify the size of import substitution. Some simple measures can at once be cited. The behaviour of M/S ratio over time can be looked into to find out the changes in relative import dependence. If it is declining over time, it is an evidence of import-substitution.

If the rate of growth of imports is slower than the rate of growth of corresponding output, this too can be related as an evidence of import substitution. For this purpose, the ratio of these growth rates is a useful index.

Besides we have in the literature of descriptive measures furnished by

Chenery.[7] Desai[8] carried out her study on India's Import Substitution (1951-63), which was based on the Chenery's formula. Chenery's descriptive measure is a useful indicator of import substitution at sectoral or industry level rather than for the economy as a whole. Chenery defines import substitution as the product of the change over time in domestic production/availability ratios of different industries and the total supply of the end year. Under this formulation, the change in the value of output is split into two components: one is the import substitution effect as defined above and the other is the residual effect measuring the hypothetical output component based by the demand expansion effect that originates in the domestic and the export sectors: hypothetical because it is one that would prevail if there had been no change in production-availability ratios. Symbolically, the Chenery formula looks as follows,

$$\Delta Q = \left(\frac{Q_2}{S_2} - \frac{Q_1}{S_1}\right) S_1 + (S_1 - S_2)\frac{Q_1}{S_1}$$

(Change in the value of output) = (Import substitution effect) + (Residual effect)

where
Q_i production in rupees in ith year
S_i supply (imports + produciton) in rupees in ith year
$i = 1, 2$ (periods)

The same measures can be arrived at in an alternative way. One can look upon import-substitution as the change in import-availability ratios over time multiplied by the total supply of the end-year. Defined this way, growth of imports over two points of time can be dived as:

$$\Delta M \text{ (change in the value of imports)} = \left(\frac{M_2}{S_2} - \frac{M_1}{S_1}\right) S_2 + (S_2 - S_1)\frac{M_1}{S_1}$$

(Import substitution effect) + (Residual effect)

M_i imports in rupees in ith year
S_i supply (imports + production) in rupees in ith year.
i 1, 2 (periods)

where M_1, M_2, are values of imports and S_1 and S_2 are values of total supplies like in the earlier formulation. The residual effect gives the hypothetical level of demand for imports that would prevail if the import content of supplies had remained constant over the same period. This formulation has been given by A. Maizels.[9]

The Choice of Measures

Between these two measures one can use any one to do the computations of import substitution, because both furnish identical results. There is, however, an advantage in using both of them because in the case of the first measure, we get, in the form of residual effect, estimates of domestic demand that would prevail

under constant production-availability ratio and in the second, we get in the same way, estimates of import demand under cosntant import-availability ratio. This reason has prompted us to use both of them.

These measures are known as absolute measures and if related to some base, can be converted into relative measures. Depending upon the base to which it is related each relative measure will furnish results that are different in magnitude but identical in direction. So, besides the absolute measures, we have used the following as relative measures:

$$(1)\left(\frac{Q_2}{S_2}-\frac{Q_1}{S_1}\right)\Big/\frac{Q_1}{S_1} \quad (2)\left(\frac{M_2}{S_2}-\frac{M_1}{S_1}\right)\Big/\frac{M_1}{S_1}$$

$$\text{and } (3)\left(\frac{Q_2}{S_2}-\frac{Q_1}{S_1}\right)\times\frac{S_1+S_2}{2}\Big/\Delta Q$$

Where Q = Production, S = Supply, M = Import, 1 = Base Year, 2 = End Year

All the formulas given above are over-simplified. They just indicate relative behaviour of imports as against domestic goods. They indicate the part of the additional output that is due to the change in production-availability ratios at two points of time. The consequences of import substitution like effects on economic growth, consumption, factor productivity, employment, income distribution, factory itensity, balance of payments and the direct and indirect imports used for domestic output added on account of import substitution are other legitimate and important factors that must be taken into account in analysing the success or otherwise of the import substitution strategy. These formulas throw no light on these aspects. If the planners concentrate only on the most productive use of available resources, which might necessitate larger import/availability ratios, then the import substitution results given above, should not be looked upon as the only criterion for the successful economic growth.

We have used these measures for whatever worth they are. The results obtained are subject to variation according to (a) the degree of aggregation (b) the choice of period (c) treatment of intermediate inputs. As can be seen from our results, the size of import substitution differs according to the level of aggregation chosen. Our results at 2-digit level are not the same as those at 3-digit level for the obvious reason that production/availability ratios are different for the components at 3-digit level from those at 2-digit level. Similarly, for the same reason the results added on year-to-year basis are not identical with those obtained for the time-interval as a whole. Moreover, the results obtained underestimate the degree of import substitution because the indirect import substitution that appears, because of the use of domestic intermediate inputs in place of imported ones, is not caught by the standard measures of import substitution.

Data and Coverage

Since import substitution is more likely to influence large industrial establishments as against small ones, we have used production data only from the census sector of the ASI. It means, we exclude establishments with 10 to 49

workers operating with power and 20-99 workers operating without power. The data on imports has been taken from the Monthly Statistics of Foreign Trade and was re-classified, as said before, according to ASI industry classification. The comparable data was used to make computations for 2 and 3-digit level industries giving us the estimates of output growth due to demand expansion and import substitution for 1960, 1965, 1970 and 1975. The data used was in current prices but because of the use of ratios in computations, the price effect is reduced. It is, however, present in the form of the use of S1 and S2. We have corrected this bias in results at constant prices.

An Analysis of Production/Availability and Import/Availability Ratios

We have graphed both production/availability and import/availability ratios over the period 1960-1975 on a year-to-year basis. Since the sum of these ratios is definitionally unity, the graph of one of them is simply the mirror-reflection of the other.

On the basis of the movements of the import/availability ratios (confining our attention to this ratio) we classify industry groups into four categories.

Category 1

This category consists of those industry groups where the import/availability ratio was low to start with and remained so for most of the period. The scope for import substitution in such groups is thus small.

There are eight industry groups within this category: Food and Beverages (20-21); Tobacco (22); Textiles (23); Foot-wear, other Wearing Apparel and Made-up Textile Goods (24); Wood and Cork except Furniture (25); Leather and Fur Products except Foot-wear and other Wearing Apparel (29); Rubber Products (30), and Non-metallic Mineral Products except Petroleum and Coal Products (33).

Of these groups Food Beverages (20-21), Wood and Cork except Furniture (25), and Non-metalic Mineral Products (33) behaved slightly erratically—a reflection perhaps of policy changes. Still the fluctuations were not large and in 1974-75 the import/availability ratios were again close to zero.

Category 2

This category consists of groups where the import/availability ratio has fallen appreciably.

There are three industry groups which fall in this category: Metal Products except Machinery and Transport Equipment (35); Non-electrical Machinery (36), and Transport Equipment (38). Non-electrical Machinery (36) is easily the most dramatic case with the graphs of the production/availability and import /availability ratios actually crossing one another. The import/availability ratio fell from 0.70 in 1961-62 to 0.14 in 1974-75. Import substitution has apparently been exceptionally strong in this industry group—a fact borne out by our measures.

Category 3

This category consists of groups where the import/availability ratio was high to begin with and continued to remain so throughout the period under study. It is likely that such groups face technical or economic constraints that do not allow a lowering of the import/availability ratio, (e.g. Resources, both human and non-human, may not be available; the market may not be large enough for production to be viable). The scope for import substitution is thus limited by exogeneous factors which may turn favourable with the passage of time.

There are five industry groups in this category : Paper and Paper Products (27); Chemicals and Chemical Products (31); Petroleum and Coal Products (32); Basic Metals (34); and Electrical Machinery (37).

Petroleum and Coal Products (32) behaves rather peculiarly. The production /availability and import/availability graphs cross one another *twice*. The import /availability ratio rises from 0.34 to a peak of 0.66 only to decline again to 0.37. Perhaps the aforementioned constraints were in force till the peak in 1968-69 and later domestic production was able to replace imports.

Chemicals and Chemical Products (31) and Electrical Machinery (37) also have humps but they are not so pronounced as in the case of Petroleum and Coal Products (32).

Category 4

This category consists of only one group—Miscellaneous Industries (39)—whose import/availability ratio fluctuates wildly. The graphs of the import/availability and production/availability ratios cross one another as many as *six* times. These fluctuations probaly reflect the alternate liberalization and tightening of import policy, affecting different industries in the group in different ways.

Analysis of Results Based on the Chenery Measure

By using the measures outlined above, we get results for import substitution and residual effects. First we comment on our results at 2-digit level (see table 5.5). At 2-digit level, we find the bulk of imports (i.e. almost 90%) are on account of chemicals and chemical products (31), Petroleum Products and Coal (32), Basic Metals (34), Machinery (36) and (37) and transport equipment (38). Imports of the traditional products are relatively small but concentrated in manufactured Foods (20), Textiles (23), Paper Products (18), Printed Materials (28), and Rubber Products (30). These traditional industries make a sizable contribution to the total output, and do not exhibit a strong import pull. Because of this, these industries have very low import/availability ratios, showing a high degree of self-reliance in the matter of serving the domestic market. It is only Wood and Cork (25) and Paper and Paper Products (27) which had in 1960 high import-availability ratios around 22% each. These also sharply declined in the subsequent period. Because of very low import-availability ratios of traditional industries their contribution to import substitution is really negligible. Together it comes to Rs. 43 crores in 1965 over 1960, Rs. 63 crores in 1970 over 1965 and Rs. 95 crores in 1975 over 1970. The growth stimulus to these

industries has largely been supplied by domestic and external demand. On the other hand, the performance of non-traditional industries listed above presents a contrasting picture. Import-availability ratios for these industries were very high in 1960 in the range of 25%-75% though in 1975 the range narrowed down to 7%-24%. This sector's total contribution to import substitution comes to Rs. 545 crores in 1965 over 1960 and Rs. 400 crores in 1970 over 1965. However, in 1975 compared to 1970 this group of non-traditional industries made a negative contribution of Rs. 98.85 crores. This is a surprising result which is supported at 3-digit level.

As pointed out above, our 3-digit level results are affected by disaggregation (see table 5.13). (A structural analysis of production and imports has been presented in details in Chapter IV). Here, we note that trends in imports, production and import substitution differ distinctly as between the traditional industries and the non-traditional industries. Imports of traditional industrial products are concentrated in Dairy Products (202), Fruits and Vegetables (203), Grain Mill Products (205), Miscellaneous Food Preparations (209), Spinning, Weaving (231), Textiles (239), Saw Mills (251), Paper and Paper Products, Printing, etc. (280), Rubber Products (300). Among the traditional industries, Dairy Products (202), Grain Mill Products (205), Bakery Products, Sugar Products (207), Miscellaneous Food (209), Distilling (291), Tobacco (220), Spinning, Weaving, etc. (231) Rope Industries (233), Textiles n.e.c. (239), Foot-wear (241), Saw Mills (251), Paper and Paper Products (271), Printing etc. (280), Tannaries (291) and Rubber Products (300) are important in production. Among the traditional industries import-availability ratios are high in 1960 only in the case of Fruits and Vegetables 79%, Dairy Products (202) 38%, Grain Mill Products (205) 16%, Wine Industries (212) 17%, Saw Mills (251) 21%, Cork and Wood Products n.e.c. (259) 26%, Paper and Paper Products (271) 22%, and Leather Products (293) 53%. Only (202), (205) and (251) are prominent in production. Among the non-traditional products, Basic Chemicals including Fertilizers (311), Paints and Varnishes (313), Miscellaneous chemicals (319), Petroleum Refineries (321), Glass and Glass Products (332), Clay Products (333), Iron and Steel (341), Non-Ferrous Metals (342), Metal Products (350), Non-Electrical Machinery (360), Electrical Machinery (370), Rail Road Equipment (382), Motor Vehicles (384), Jewellery and related Products (394), Photographic and Optimal Goods (392), Professional and Scientific Instruments (391), Aircraft (386) are major imports. Among the non-traditional industries Basic Chemicals including Fertilizers (311), Vegetable and Animal Oils and Fats (312), Paints, Varnishes and Lacquers (313), Petroleum Refineries (321), Miscellaneous Products of Petroleum and Coal (329), Glass and Glass Products (332), Non-Metallic Mineral Products n.e.c. (339), Hydraulic Cement (334), Iron and Steel Basic Industries (341), Non-Ferrous Basic Metals (342), Metal Products except Machinery and Transport Equipment (350), Non-electrical Machinery (360), Electrical Machinery (370), Shipbuilding and Repairing (381), Railroad Equipment (382), Manufacture of Motor Vehicles (383), Repair of Motor Vehicles (384), Motorcycles and Bicycles (385) are all prominent in production. Aircraft, Scientific Instruments, Photographic and Optical goods, watches and

clocks jewellery and related products are important in imports but not important in production. Import-availability ratios are very high in 1960 and remain so throughout for these products but their weight in the total is small. Among large non-traditional industries, import-availability ratios are quite high in 1960 for Basic Metals (342) 78%, Metal Products (350) 25%, Non-Electrical Machinery (370) 70%, Motor Vehicles (383) 22%, Railroad Equipment (382) 20%, Petroleum Refineries (321) 59%, Paints and Varnishes (343) 47%, Vegetable Oils and Fats (312) 42%, and Basic Chemicals (311) 36%. Moreover, these ratios sharply decline during the subsequent period except for fruits and vegetables. In the case of non-traditional industries, these ratios decline substantially in all cases and all these groups are prominent in production. So we find that at 3-digit level, import substitution was substantial in these industries. Our results are as follows:

(Rs. in crores)

	Total import substitution	Import substitution in traditional industries	Total residual effect	Residual effect in traditional industries
1965 over 1960	+ 405.65	+ 55.34	+ 3008.00	+ 1256.89
1970 over 1965	+ 491.86	+ 53.42	+ 4511.12	+ 1857.60
1975 over 1970	- 204.70	+ 48.28	+ 9905.56	+ 3148.08
1970 over 1960	+ 1223.36	+ 155.09	+ 7193.27	+ 3068.17
1975 over 1960	+ 2542.87	+ 362.12	+15574.62	+ 6040.14

Impact of Devaluation

The results obtained above took no account of the 1966 devaluation. This can be justified on the ground that because of the continuance of internal inflationary policies during the post-development period, the effects of devaluation were completely neutralised. Moreover, because of the withdrawal of export subsidies and imposition of export taxes after the devaluation, the actual quantum of devaluation was much lesser than the declared quantum. Even then, we thought of taking account of this change. We decided to inflate 1965 import values rather than deflate 1970 values by the amount of the devaluation to bring comparability between them and we found that the value of import substitution increased to Rs. 1064 crores from Rs. 491.86 crores in 1970 over 1965.

Import Substitution and Ranking of Industries

With the help of relative measures mentioned before different industries at 2-digit level were ranked according to the value of import substitution. We found the ranking to be almost identical. This shows our methods and results are quite reliable.

Comments on Results

1. We see that import substitution is relatively and absolutely more prominent in the new non-traditional industries. Even here the share of import substitution in the growth of output is smaller than the share due to domestic and external demand. However, this latter influence is less prominent in the non-traditional industries than the traditional ones.
2. In many traditional as well as non-traditional industries, the import substitution as a stimulus to growth is nearing saturation because import availability ratios are nearing zero.
3. Some industries in 1975 over 1970 experience negative import substitution e.g. Iron and Steel (341) (Rs.-122 crores), Petroleum Refineries (321) (Rs.-82 crores), Basic Chemicals (311) (Rs. -171 crores). It is only Non-Electrical Machinery (360) which made a substantial contribution to import substitution during 1975 over 1970. Import substitution was on the whole negative. It shows that an impulse of import-substitution cannot be sustained for a long time. It is worth noting that in addition to industries mentioned above there are many industries which show a negative, though small, contribution to import substitution in 1975 over 1970. In this category we have industries like canning and preservation of fruits and vegetables (203), sugar factories and refineries (207), tobacco manufacturing (220), spinning, weaving and finishing of textiles (231), textiles, n.e.c. (239), furniture and fixtures (260) rubber products (300), non-ferrous basic metal industries (342), metal products except machinery and transport equipment (350), electrical machinery (370), railroad equipment (382), motor vehicles (383), aircraft (386), professional and scientific instruments (391), manufacture of industries, n.e.c. (399).

This evidence strengthens the view that the import substitution bias in our trade and industrial policies must be changed. Internally generated demand push can lead to further industrial expansion but will call for complementary imports. This can now be allowed, in view of sizeable exchange reserves, growing international capital mobility, and optimistic prospects of vigorous exports.

Import Substitution at Constant (1960) Prices

The above results (except for the section on graphs) are all at current prices. Our results on import substitution at constant prices appear along with the other data on import substitution at the end of the chapter(see table 5.6). Constant price values were obtained by scaling 1960 values with the help of quantity indices of imports of production.

$$\text{Constant price value of group x in year y} = \text{1960 value of group x} \times \frac{\text{Quantity index of group x in year y}}{100}$$

Expectedly, the measures at constant prices are lower than those at current prices. However, the measures at constant prices reveal the same trends as those at current prices. So we stand by the conclusions of our analysis at current prices.

The measures for the period 1975 over 1970 highlight the problem of the choice of the level of aggregation. Summing over the two-digit level of the ASI

classification, industry by industry, gives a positive import substitution of Rs. 31.2883 crores. If we were to use the industry wide (i.e. for industry as a whole) measure of import substitution we have negative import substitution to the tune of Rs. 11.7319 crores.

Import Substitution vs Demand Expansion (see table 5.5, 5.6, 5.9, 5.10)

The Chenery Measure not only gives the size of import-substitution but also the quantum of growth due to demand expansion. Tables 5.9 and 5.10 give estimates of the contribution made by the demand-factor at 2-digit level both at current and constant prices. These figures show that a major stimulus to growth in India is not import-substitution but domestic demand. This finding definitely supports our basic argument that India's industrial growth of the last 25 years was largely endogenous growth. But since this kind of growth is biased in favour of foreign technology and imported spares, we call it a dependent endogenous growth.

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Table 5.1 : VALUE OF PRODUCTION IN INDIAN MANUFACTURING SECTOR

(Rs. in crores at current prices)

ASI Code	*Name of the industry group*	1960	1965	1970	1975
20	Food	673.0362	1088.3482	1801.3570	2842.6700
21	Beverages	6.9578	22.4322	56.8364	192.3500
22	Tobacco	82.9009	150.9401	249.4395	311.7700
23	Textiles	933.3810	1541.5369	2286.7279	3611.3900
24	Foot-wear, other wearing apparel & made-up textile goods	4.4802	15.7502	26.9538	47.4900
25	Wood, cork except manufacture of furniture	11.8436	26.8598	32.8263	74.1600
26	Furniture & fixtures	9.4134	22.0063	35.2865	61.4000
27	Paper & paper products	64.4428	114.5267	231.9560	490.1400
28	Printing, publishing & allied industries	54.4201	95.1072	145.0768	220.0000
29	Leather & fur products except foot-wear & other wearing apparel	16.8513	25.5024	48.2366	97.2400
30	Rubber Products	66.5598	133.5150	232.8596	377.9400
31	Chemicals & chemical products	241.3498	590.5086	1354.1315	3417.9200
32	Products of petroleum & coal	50.9485	120.2987	341.6764	1210.0500
33	Non-metallic mineral products except product of petroleum & coal	116.6948	231.3924	363.2017	603.6100
34	Basic metal industries	312.5820	746.9694	1264.5292	2231.0200
35	Metal products except machinery & transport equipment	68.2950	163.6401	251.3737	386.2600
36	Machinery except electrical machinery	82.3650	287.2221	551.0239	1209.8800
37	Electrical machinery, apparatus, appliances & supplies	100.0436	289.1442	618.9019	1204.8400
38	Transport equipment	275.2816	579.9415	845.7570	1433.2000
39	Miscellaneous manufacturing industries	26.4744	74.0005	129.7120	112.2100
51	Electricity	75.8830	368.2180	822.9837	1256.1700
	Total	3274.2048	6687.8605	11690.8474	21391.7100

Table 5.2 : VALUE OF INDIA'S INDUSTRIAL IMPORTS (1960-75)

(Rs. in crores at current prices)

ASI Code No.	*Name of the industry group*	1960	1965	1970	1975
20	Food	45.2807	69.2736	92.7203	99.1493
21	Beverages	0.5696	0.3673	0.2897	0.6749
22	Tobacco	0.0146	0.1685	0.0189	0.1546
23	Textiles	35.2246	34.6433	13.5396	23.3786
24	Foot-wear, other wearing apparel & made-up textile goods	0.0061	0.0309	0.2057	0.0987
25	Wood & cork except manufacture of furniture	3.1839	1.3849	0.8417	1.5247
26	Furniture & fixtures	0.1125	0.1132	0.1518	0.9125
27	Paper & paper-products	18.4597	19.2589	37.2866	68.6616
28	Printing, publishing & allied industries	2.8167	3.2142	5.9719	8.2306
29	Leather & fur products except foot-wear & other wearing apparel	0.3430	0.0835	0.0715	0.1376
30	Rubber products	3.6420	1.1598	2.5641	6.2643
31	Chemicals & chemical products	92.0558	123.1911	240.1146	754.0820
32	Products of petroleum & coal	69.4741	33.6921	30.8625	198.7538
33	Non-metallic mineral products except product of petroleum & coal	6.2481	4.8325	8.7049	9.1842
34	Basic metal industries	169.2527	166.9048	267.4810	597.5505
35	Metal products except machinery & transport equipment	23.7065	19.4037	11.0610	28.4989
36	Machinery except electrical machinery	201.3122	332.4429	256.9323	396.7540
37	Electrical machinery, apparatus, appliances & supplies	56.1451	87.1284	69.3045	150.1269
38	Transport equipment	69.2412	69.8966	58.2630	122.8970
39	Miscellaneous manufacturing industries	12.4249	16.8796	51.0254	89.5988
51	Electricity	—	0.0002	—	—
	Total	809.5140	984.0700	1147.4110	2556.6335

Table 5.3 : INDUSTRIAL PRODUCTION AT CONSTANT (1960) PRICES.

(Rs. in crores)

ASI Code No	1960	1965	1970	1975
20-21	679.9940	835.7126	1070.9906	1158.7098
22	82.9009	122.3617	141.0144	161.9884
23	933.3810	1071.5214	1023.9190	1109.7900
24	4.4802	7.5895	7.2266	5.9407
25	11.8436	27.8443	23.5332	27.3469
27	64.4428	94.7954	139.3253	153.3094
29	16.8513	20.6765	11.0039	11.5768
30	66.5598	106.0963	143.5695	171.8574
31	241.3498	371.4373	570.7923	817.6931
32	50.9485	79.6825	151.4699	181.8352
33	116.6948	174.1086	220.6699	271.8989
34	312.5820	562.6476	642.3560	811.4629
35	68.2950	140.4145	149.5661	213.5585
36	82.3650	196.6876	304.3387	510.9925
37	100.0436	204.4891	362.8581	436.9904
38	275.2816	562.4003	363.3717	389.5235
39	26.4744	35.1845	31.7693	22.5827
51	75.8830	144.8606	253.4492	372.2820
TOTAL	3210.3713	4758.4603	5611.2237	6829.3391

* Groups 20 & 21 (vix. Manufacture of food & Manufacture of beverages) have been combined. Groups 26 (Manufacture of furniture & fixtures) and 28 (Printing, publishing & allied industries) have been omitted as no price index was available for deflating the two groups. Their values in the four years were as follows (in Rs. Crores):

	1960	1965	1970	1975
Group 26	9.4134	22.0063	35.2865	61.4000
Group 28	54.4201	95.1072	145.0768	220.0000

Their percentage shares in total industrial production in the respective years were as follows:

	1960	1965	1970	1975
Group 26	0.29	0.33	0.30	0.29
Group 28	1.66	1.42	1.241.03	

Table 5.4 : VALUE OF IMPORTS AT CONSTANT (1960) PRICES (AT THE TWO-DIGIT LEVEL OF THE ASI CLASSIFICATION).

(Rs. in crores)

ASI Code No.*	1960	1965	1970	1975
20-21	45.8503	58.4776	50.4012	63.0400
22	0.0146	0.0201	0.0228	0.0061
23	35.2246	42.9740	20.4303	18.3168
24	0.0061	0.0027	0.0085	0.0045
25	3.1839	1.6875	0.8597	0.8278
27	18.4597	21.0441	23.2592	24.5514
29	0.3430	0.0789	0.0652	0.0720
30	3.6420	1.3111	2.8043	3.3871
31	92.0558	127.0370	201.6022	381.1110
32	69.4741	81.2847	108.3796	101.4322
33	6.2481	17.1823	22.4307	4.8735
34	169.2527	175.8379	89.3896	130.0003
35	23.7065	18.7281	4.2672	9.9567
36	201.3122	295.9289	140.9185	64.4199
37	56.1451	80.8489	89.2707	157.2063
38	69.2412	60.2398	21.4648	20.7724
39	12.4249	15.6554	27.9560	11.9279
51	—	—	—	—
TOTAL	806.5848	998.3390	803.5305	991.9059

* The names of these industry groups appear in previous tables.

Table 5.5 : THE CHENERY MEASURE OF IMPORT SUBSTITUTION* (AT THE TWO-DIGIT LEVEL OF THE ASI CLASSIFICATION).

(Rs. in crores at current prices)

ASI Code No.	1960-1965	1965-1970	1970-1975	1960-1970	1960-1975
20	3.7044	20.4560	45.0098	26.5171	86.1953
21	1.3589	0.6284	0.3088	4.0331	13.9364
22	- 0.1360	0.2495	- 0.1248	0.0249	- 0.0936
23	22.6970	37.0343	- 1.8174	70.1582	109.0431
24	- 0.0095	- 0.1521	0.2617	- 0.1684	- 0.0333
25	4.6011	0.8080	0.3709	6.2925	14.5163
26	0.1482	0.0284	- 0.6418	0.2658	- 0.1745
27	10.5289	1.4808	8.7173	22.6702	55.7684
28	1.6223	- 1.0271	0.7760	1.4652	2.9898
29	0.4247	0.0870	0.0097	0.8889	0.8277
30	5.8314	- 0.5415	- 2.0747	9.6524	13.6777
31	73.8679	35.0734	- 0.4172	200.0779	398.0090
32	55.2211	50.4045	- 81.8515	183.9970	613.9567
33	7.1576	- 1.0785	5.1475	10.1902	21.9380
34	154.1706	12.2561	- 103.8085	270.7062	395.9999
35	27.7677	16.7696	- 11.0326	56.5809	78.3554
36	107.3260	176.5384	114.2317	316.4764	743.5502
37	48.1253	90.0862	- 13.6852	178.1078	336.9803
38	54.1965	38.9633	22.4078	123.3987	189.8438
39	12.1507	- 20.1341	- 29.6457	4.0304	- 25.1454
51	—	—	—	—	—
TOTAL**	590.7548	457.9306	- 47.8582	1485.3654	3050.1412

* The Chenery measure of import-substitution is given by $(U_2 - U_1)S_2$, where U_1 and U_2 are the production/availability ratios in the base and current years respectively and S_2 is the supply in the current year.

** The total import-substitution measure given above is an aggregative measure obtained by adding up the import substitution in each industry. This measure is different from the measure obtained by multiplying total supply in the current year by the difference in the production/availability ratios (of current over base year) for the industrial sector as a whole. The latter is given below :

(Rs. in crores)

Year	1960-1965	1965-1970	1970-1975	1960-1970	1960-1975
Import substitution					
TOTAL	536.2679	499.4083	- 416.7012	1396.8025	2188.8786

Table 5.6 : THE CHENERY MEASURE OF IMPORT-SUBSTITUTION (AT THE TWO-DIGIT LEVEL OF THE ASI CLASSIFICATION) THE FIGURES ARE AT CONSTANT (1960) PRICES.

(Rs. in crores)

ASI Code No.	1965 over 1960	1970 over 1965	1975 over 1970	1970 over 1960	1975 over 1960
20-21	- 1.9672	22.9885	- 8.1857	20.5215	14.1723
22	0.0000	0.0000	0.0324	0.0000	0.0324
23	- 2.4519	19.8426	3.8356	17.5451	22.7878
24	0.0076	0.0065	0.0024	0.0014	0.0036
25	4.5715	0.5342	0.1634	4.3102	5.1419
27	4.7494	6.2758	0.9071	12.9417	15.0648
29	0.3342	- 0.0232	- 0.0035	0.1550	0.1596
30	4.2641	- 1.0246	- 0.0175	4.7864	5.7130
31	10.5677	- 4.7116	- 68.2120	11.6632	- 50.1100
32	11.5539	22.8668	16.7128	41.5240	61.9789
33	- 7.4603	- 0.6078	20.6749	- 10.0887	9.1888
34	83.5966	84.8093	- 14.9693	167.6429	200.7200
35	27.2800	13.8450	- 3.7551	35.3817	47.6534
36	53.6952	126.5421	117.6718	175.0751	343.9240
37	21.7428	38.8379	- 39.9300	73.2901	56.3893
38	64.9414	15.7398	2.1335	55.8783	61.7085
39	0.5847	- 9.5680	4.2275	- 8.8812	- 0.9042
51	—	—	—	—	—
TOTAL*	276.0196	336.3403	31.2883	601.7467	793.6241

* This total is the sum of the above column. The other total measure of import-substitution obtained by multiplying the end year supply with the difference in production/availability ratios of the manufacturing sector as a whole is given below :

(Rs. in crores)

1965 over 1960	1970 over 1965	1975 over 1970	1970 over 1960	1975 over 1960
157.7363	308.5497	- 11.7319	484.3139	578.7721

Table 5.7 : SHARE OF IMPORT SUBSTITUTION* IN CHANGE IN PRODUCTION.

(Rs. in crores at current prices)

ASI Code No.	1960-1965	1965-1970	1970-1975	1960-1970	1960-1975
20	0.0089	0.0287	0.0432	0.0235	0.0397
21	0.0878	0.0182	0.0023	0.0809	0.0752
22	- 0.0020	0.0025	- 0.0020	0.0001	- 0.0004
23	0.0373	0.0497	- 0.0014	0.0518	0.0041
24	- 0.0008	- 0.0136	0.0127	- 0.0075	- 0.0008
25	0.3064	0.1354	0.0090	0.2999	0.2329
26	0.0118	0.0021	- 0.0246	0.0103	- 0.0034
27	0.2102	0.0126	0.0338	0.1353	0.1310
28	0.0399	- 0.0206	0.0104	0.0162	0.0181
29	0.0491	0.0038	0.0002	0.0283	0.0103
30	0.0871	- 0.0055	- 0.0143	0.0580	0.0439
31	0.2116	0.0459	- 0.0002	0.1798	0.1253
32	0.7963	0.2277	- 0.0943	0.6329	0.5297
33	0.0624	- 0.0082	0.0214	0.0413	0.0451
34	0.3549	0.0237	- 0.1074	0.2844	0.2064
35	0.2912	0.1911	- 0.0818	0.3091	0.2464
36	0.5239	0.6692	0.1734	0.6753	0.6595
37	0.2545	0.2732	- 0.0234	0.3433	0.3050
38	0.1779	0.1466	0.0381	0.2163	0.1640
39	0.2557	- 0.3614	**	0.0390	- 0.2933
51	—	—	—	—	—
TOTAL	0.1731	0.0915	- 0.0049	0.1765	0.1684

* The measure of import substitution used here is the "Chenery measure"

** For this group, in the period 1970-1975, both the change in production and the measure of import-substitution were negative (Rs.- 17.5020 crores and Rs. - 29.6457 crores respectively.)

Table 5.8 : SHARE OF IMPORT-SUBSTITUTION IN CHANGE IN PRODUCTION AT CONSTANT (1960) PRICES.

ASI Code No.	1965 over 1960	1970 over 1965	1975 over 1970	1970 over 1960	1975 over 1960
20-21	- 0.0126	0.0977	0.0933	0.0525	0.0296
22	0.0000	0.0000	0.0015	0.0000	0.0004
23	- 0.0177	- 0.4168	0.0447	0.1938	0.1292
24	0.0024	0.0179	- 0.0019	0.0005	0.0025
25	0.2857	- 0.1239	0.0428	0.3687	0.3317
27	0.1565	0.1409	0.0649	0.1728	0.1695
29	0.0874	0.0024	- 0.0061	- 0.0265	- 0.0303
30	0.1079	- 0.0273	- 0.0006	0.0622	0.0543
31	0.0812	- 0.0236	- 0.2763	0.0354	- 0.0869
32	0.4028	0.3183	0.5504	0.4131	0.4735
33	- 0.1299	- 0.0131	0.4036	- 0.0970	0.0592
34	0.3343	1.0640	- 0.0885	0.5084	0.4023
35	0.3783	1.5129	- 0.0587	0.4354	0.3280
36	0.4697	1.1755	0.5694	0.7887	0.8024
37	0.2082	0.2452	- 0.5386	0.2789	0.1674
38	0.2262	- 0.0791	0.0816	0.6343	0.5402
39	0.0671	2.8016	- 0.4602	- 1.6773	0.2323
51	—	—	—	—	—
TOTAL	0.1783	0.3944	0.0257	0.2506	0.2193

If one uses the other total measure of import substitution — the product of end year total supply and the change in the production/availability ratio of the manufacturing sector as a whole—the share of import substitution in change in production is as below :

1965 over 1960	1970 over 1965	1975 over 1970	1970 over 1960	1975 over 1960
0.1019	0.3618	- 0.0096	0.2017	0.1599

The figures that are within ovals are those groups which have experienced a negative change in production during that period.

Table 5.9 : CONTRIBUTION OF EXPANSION IN DEMAND TO THE CHANGE IN PRODUCTION (ASSUMING THAT THE RATIO OF DOMESTIC OUT PUT TO TOTAL SUPPLY REMAINS UNALTERED)*

(Rs. in crores at current prices)

ASI Code No.	1960-1965	1965-1970	1970-1975	1960-1970	1960-1975
20	411.6076	692.5528	996.3032	1101.8037	2083.4385
21	14.1155	33.7758	135.2048	45.8455	171.4558
22	68.1752	98.2499	62.4553	166.5137	228.9627
23	585.4589	708.1567	1326.4795	1283.1887	2568.9659
24	11.2795	11.3557	20.2745	22.6420	43.0431
25	10.4151	5.1585	40.9628	14.6902	47.8001
26	12.4447	13.2518	26.7553	25.6073	52.1611
27	39.5550	115.9485	249.4667	144.8430	369.9288
28	39.0648	50.9967	74.1472	89.1915	162.5901
29	8.2264	22.6472	48.9937	30.4964	79.5610
30	61.1238	99.8861	147.1551	156.6474	297.7025
31	275.2909	728.5495	2064.2057	912.7038	2778.5612
32	14.1291	170.9732	950.2251	106.7309	545.1448
33	107.5400	132.8878	235.2608	236.3167	464.9772
34	280.2168	505.3037	1070.2993	681.2410	1522.4381
35	67.5774	70.9640	145.9189	126.4978	239.6096
36	97.5311	87.2634	544.6244	152.1825	383.9648
37	140.9753	239.6715	599.6233	340.7505	767.8161
38	250.4634	226.8522	565.0352	447.0767	968.0746
39	35.3754	75.8456	12.1437	99.2072	110.8810
51	292.3350	454.7657	433.1863	747.1007	1180.2870
Total**	2822.9009	4545.0563	9748.7208	6931.2772	15067.3640

* This table is obtained as a residual from the tables "Changes in Production" and "The Chenery measure of import substitution". It is also equal to $U_1(S_2-S_1)$ where U_1 is the production/availability ratio in the base year and S_2 and S_1 are the supplies in the current and the base years respectively.

** This total is the aggregate of the above quantities.

Table 5.10 : CONTRIBUTION OF EXPANSION IN DEMAND TO CHANGE IN PRODUCTION (1960) AT CONSTANT PRICES, (ASSUMING THE RATIO OF DOMESTIC OUTPUT TO TOTAL SUPPLY REMAINS UNALTERED)

(Rs. in crores)

ASI Code No.	1965 over 1960	1970 over 1965	1975 over 1970	1970 over 1960	1975 over 1960
20-21	157.6858	212.2895	95.9049	370.4751	464.5435
22	39.4608	18.6527	20.9416	58.1135	79.0551
23	140.5923	- 67.4450	82.0354	72.9929	153.6212
24	3.1017	- 0.3564	- 1.2883	2.7450	1.4569
25	11.4292	- 4.8453	3.6503	7.3794	10.3614
27	25.6032	38.2541	13.0770	61.9408	73.8018
29	3.4910	- 9.6494	0.5764	- 6.0024	- 5.4341
30	35.2724	38.4978	28.3054	72.2233	99.5846
31	119.5198	204.0666	315.1128	317.7793	626.4533
32	17.1301	48.9706	13.6525	58.9974	68.9078
33	64.8741	47.1691	30.5541	114.0638	146.0153
34	166.4690	*- 5.1009	184.0762	162.1311	298.1609
35	44.8395	*- 4.6934	67.7475	45.8894	97.6101
36	60.6274	*- 18.8910	88.9820	46.8986	84.7035
37	82.7027	119.5311	114.0623	189.5244	280.5575
38	222.1773	- 214.7684	24.0183	32.2118	52.5334
39	8.1254	6.1528	- 13.4141	14.1761	- 2.9875
51	68.9776	108.5886	118.8328	177.5662	296.3990
TOTAL	1272.0694	516.4231	1186.8271	1799.1057	2825.3437

* If one uses the other total measure of import-substitution—the product of end year total supply and the change in the producion/availability ratio of the manufacturing sector as whole—the contribution of expansion in demand to change in produciton is as follows :

(Rs. in crores)

1965 over 1960	1970 over 1965	1975 over 1970	1970 over 1960	1975 over 1960
1390.3527	544.2137	1229.8473	733.8015	3040.1957

Table 5.11 : VALUE OF PRODUCTION IN INDIAN MANUFACTURING SECTOR 1960-75.

(Rs. in crores at current prices)

ASI Code No.	*Name of the industry*	1960	1965	1970	1975
202	Dairy products	9.0431	34.0556	119.5900	309.1100
203	Canning & preservation of fruits & vegetables	1.3231	6.3261	6.7500	12.2100
204	Canning & preservation of fish & other seafoods	0.5191	3.1308	11.2700	24.6100
205	Grain mill products	94.1089	124. 0566	192.7634	209.1400
206	Bakery products	8.0626	20.9525	42.8089	75.1000
207	Sugar factories & refineries	195.4424	307.9676	564.6935	865.2400
208	Cocoa, chocolate & sugar confectionery	1.2310	4.0192	3.4210	11.9700
209	Miscellaneous food preparations	363.3060	587.8398	860.0602	1335.2900
211	Distilling, rectifying & blending of spirits	3.6497	5.0139	8.1864	99.8000
212	Wine industries	0.3208	8.4200	19.2100	35.5100
213	Breweries & manufacturing of malt	2.0278	3.0133	9.9900	24.2700
214	Soft drinks & carbonated water industries	0 9595	5.9850	19.4500	32.7700
220	Tobacco manufacturing	82.9009	150.9401	249.4395	311.7700
231	Spinning, weaving & finishing of textiles	875.9611	1438.6934	2144.0699	3301.0398
232	Knitting mills	1.9938	6.3750	11.9400	22.4900
233	Cordage, rope & twine industries	2.7080	4.3800	5.8500	57.9400
239	Textiles n.e.c.	52.7181	92.0885	124.8680	229.9202
241	Foot-wear	1.2820	6.4463	8.9300	42.7800
243	Wearing apparel (except foot-wear)	3.1982	9.3039	18.0238	4.7100
251	Saw mills, planning & other wood mills	9.5229	22.0098	26.4375	62.7700
252	Wooden & cane containers & cane small ware	0.8700	1.3500	2.3700	4.1400
259	Cork & wood products n.e.c.	1.4507	3.5000	4.0188	7.2500
260	Furnitures & fixtures	9.4134	22.0063	35.2865	61.4000
271	Paper & paper-products (board) & pulp	64.4428	114.5267	231.9560	490.1400
280	Printing, publishing & allied industries	54.4201	95.1072	145.0768	220.0000
291	Tanneries & leather finishing plants	16.5853	24.7324	47.1266	96.0100
293	Leather products except foot-wear & other wearing apparel	0.2660	0.7700	1.1100	1.2300
300	Rubber products	66.5598	133.5150	232.8596	377.9400
311	Basic industrial chemicals including fertilizers	93.3216	258.5156	689.3733	1976.7600
312	Vegetable & animal oils & fats (except edible oils)	5.0657	35.6700	84.2482	160.8700

Contd.

Table 5.11 : *(Continued)*

(Rs. in crores at current prices)

ASI Code No.	*Name of the industry*	1960	1965	1970	1975
313	Paints, varnishes & lacquers	14.0600	25.8606	43.6629	270.3100
319	Miscellaneous chemical products	128.9025	270.4624	536.8471	1009.9800
321	Petroleum refineries	47.1395	81.7667	279.1364	970.2700
329	Miscellaneous products of petroleum & coal	3.8090	38.5320	62.5400	239.7800
331	Structural clay products	16.0009	27.3315	44.5747	85.1800
332	Glass & glass products	15.8877	31.0337	53.7113	107.0900
333	Pottery, china & earthenware	5.7392	13.1957	18.7680	26.2800
334	Cement (hydraulic)	53.4317	106.8930	174.0900	250.0500
339	Non-metallic mineral products n.e.c.	25.6353	52.9385	72.0577	135.0100
341	Iron & steel basic industries	265.5698	631.3382	1028.9106	1944.3800
342	Non-ferrous basic metal industries	57.0122	115.6312	235.6186	286.6400
350	Metal products except machinery & transport equipment	68.2950	163.6401	251.3737	386.2600
360	Machinery except electrical machinery	82.3650	287.2221	551.0239	1209.8800
370	Electrical machinery, apparatus, appliances & supplies	100.0436	289.1442	618.9019	1204.8400
381	Shipbuilding & rapairing	18.5747	20.3582	37.9344	117.5000
382	Rail-road equipment	90.4014	179.6389	219.6047	280.1400
383	Motor vehicles	118.3332	267.8031	385.9478	715.0200
384	Repair of motor vehicles	16.8564	48.7346	79.7734	148.9300
385	Motor cycles & bicycles	23.9777	50.0967	107.0667	149.3200
386	Aircraft	7.1382	13.3100	15.4300	22.2900
391	Professional & scientific measuring & controlling instruments	3.6275	14.4739	32.6845	36.7300
392	Photographic & optical goods	0.5235	2.1300	9.6700	2.8800
393	Watches & clocks	0.2339	4.7270	8.2800	18.5700
394	Jewellery & related articles	4.4200	6.8893	8.6700	19.9200
395	Musical instruments				
399	Industries n.e.c.	17.6695	45.7803	70.4073	34.1100
511	Electric light & power	75.8830	368.2180	822.9837	1256.1700
	TOTAL	3274.2048	6687.8605	11690.8472	21391.7100

Table 5.12 : VALUE OF INDIA'S INDUSTRIAL IMPORTS 1960-75

(Rs. in crores at current prices)

ASI Code No.	*Name of the industry*	1960	1965	1970	1975
202	Dairy products	5.7085	7.1953	10.6137	24.8838
203	Canning & preservation of fruits & vegetables	5.1812	5.0440	7.1349	13.1704
204	Canning & preserving of fish & other seafoods	0.0067	0.0039	0.0052	0.0485
205	Grain mill products	18.4768	38.5661	36.8981	14.6742
206	Bakery products	0.0004	0.0043	0.0121	0.0679
207	Sugar factories & refineries	0.0710	0.2888	0.5151	0.9681
208	Cocoa, chocolate & sugar confectionery	0.1509	0.1374	0.4625	0.6104
209	Miscellaneous food preparations	15.6852	18.0338	37.0787	43.7260
211	Distilling, rectifying & blending of spirits	0.4535	0.2896	0.2497	0.5256
212	Wine industries	0.0699	0.0549	0.0302	0.0927
213	Breweries & manufacturing of malt	0.0458	0.0133	0.0098	0.0566
214	Soft drinks & carbonated water industries	0.0004	0.0095	—	—
220	Tobacco manufacturing	0.0146	0.1685	0.0189	0.1546
231	Spinning, weaving & finishing of textiles	26.0034	27.2169	11.3465	18.3832
232	Knitting mills	0.0078	0.0169	0.0305	0.1167
233	Cordage, rope & twine industries	0.2276	0.5062	0.1706	0.1545
239	Textiles-n.e.c.	8.9858	6.9033	1.9920	4.7242
241	Foot-wear	0.0004	0.0010	0.0432	0.0015
243	Wearing apparel (except foot-wear)	0.0057	0.0299	0.1625	0.0972
251	Saw mills, planning & other wood mills	2.6496	0.5791	0.1552	0.2239
252	Wooden & cane containers & cane small ware	0.0046	0.0007	0.0038	0.0301
259	Cork & wood products n.e.c.	0.5297	0.8051	0.6827	1.2707
260	Furnitures & fixtures	0.1125	0.1132	0.1518	0.9125
271	Paper & paper-products (board) & pulp	18.4597	19.2589	37.2866	68.6616
280	Printing, publishing & allied industries	2.8167	3.2142	5.9719	8.2306
291	Tanneries & leather finishing plants	0.0324	0.0432	0.0519	0.1183
293	Leather products except foot-wear & other wearing apparel	0.3106	0.0403	0.0196	0.0193
300	Rubber products	3.64.20	1.1598	2.5641	6.2643
311	Basic industrial chemicals including fertilizers	54.2655	84.5563	147.6320	632.1453
312	Vegetable & animal oils & fats (except edible oils)	3.7872	15.2086	38.3981	34.1032
313	Paints, varnishes & lacquers	12.8759	6.5297	9.2466	11.2875
319	Miscellaneous chemical products	21.1272	16.8965	44.8379	76.5460

contd.

Table 5.12 *(Continued)*

(Rs. in crores at current prices)

ASI Code No.	*Name of the industry*	1960	1965	1970	1975
321	Petroleum refineries	69.4168	33.5067	30.7173	198.5869
329	Miscellaneous products of petroleum & coal	0.0573	0.1854	0.1452	0.1669
331	Structural clay products	2.3353	0.8810	4.2076	1.5646
332	Glass & glass products	1.3648	1.2517	1.8132	3.4093
333	Pottery, china & earthen-ware	0.0359	0.0885	0.0642	0.1258
334	Cement (hydraulic)	0.0575	0.1407	0.0192	—
339	Non-metallic mineral products n.e.c.	2.4546	2.4706	2.6007	4.0845
341	Iron & steel basic industries	1.8490	98.2550	147.8446	419.4208
342	Non-ferrous basic metal industries	167.4037	68.6498	119.6364	178.1297
350	Metal products except machinery & transport equipment	23.7065	19.4037	11.0610	28.4989
360	Machinery except electrical machinery	201.3122	332.4429	256.9323	396.7540
370	Electrical machinery, apparatus, appliances & supplies	56.1451	87.1284	69.3045	150.1269
381	Shipbuilding & repairing	0.7062	4.9334	1.9675	1.5876
382	Rail-road equipment	24.0043	24.8745	14.0052	25.2518
383	Motor vehicles	34.0277	32.6190	22.9705	48.8797
384	Repair of motor vehicles				
385	Motor cycles & bicycles	1.4566	0.8378	0.0775	0.2066
386	Aircraft	9.0464	6.6319	19.2423	46.9713
391	Professional & scientific measuring & controlling instruments	5.6481	8.7701	13.6788	20.2525
392	Photographic & optical goods	4.2782	4.7682	9.9988	11.2529
393	Watches & clocks	0.7856	0.3773	0.5480	1.3103
394	Jewellery & related articles	—	1.9734	24.9363	53.5431
395	Musical instruments				
399	Industries n.e.c.	1.7130	0.9906	1.8635	3.2400
511	Electric light & power	—	0.0002	—	—
	TOTAL	809.5140	984.0700	1147.4110	2556.6330

Table 5.13 : CHENERY MEASURE OF IMPORT SUBSTITUTION (AT THE THREE DIGIT LEVEL OF THE ASI CLASSIFICATION)

(Rs. in crores at current prices)

ASI Code No.	1965-1960	1970-1965	1975-1970	1970-1960	1975-1960
202	8.7699	12.0959	2.3380	39.7772	104.3731
203	4.0125	- 0.9761	- 0.1269	3.9239	7.0456
204	0.0360	0.0101	- 0.0370	0.1376	0.2638
205	- 11.8877	17.5691	20.4580	0.7808	21.2225
206	- 0.0042	- 0.0043	- 0.0451	- 0.0128	- 0.0677
207	- 0.1541	0.0000	- 0.1732	- 0.2826	- 0.6063
208	0.3163	- 0.3340	0.8881	- 0.0384	0.7636
209	7.0281	- 12.1114	15.9966	- 1.7046	13.3765
211	0.2965	0.2109	2.4479	0.6825	10.5643
212	1.4611	0.0943	- 0.0356	3.4113	6.2768
213	0.0536	0.0340	- 0.0316	0.2110	0.4817
214	- 0.0072	0.0311	0.0000	0.0078	0.0197
220	- 0.1360	0.2495	- 0.1248	0.0249	- 0.0936
231	14.9523	28.6670	- 0.6639	50.6522	77.3426
232	0.0083	0.0012	- 0.0610	0.0168	- 0.0294
233	- 0.1275	0.4534	1.4872	0.2962	4.3455
239	7.5135	6.8504	- 1.0324	16.4791	29.4479
241	0.0006	- 0.0413	0.2054	- 0.0403	0.0128
243	- 0.0131	- 0.1037	- 0.0543	- 0.1291	- 0.0884
251	4.3393	0.5265	0.1386	5.6350	13.4870
252	0.0065	- 0.0026	- 0.0234	0.0088	- 0.0079
259	0.3466	0.1965	- 0.0322	0.5750	1.0089
260	0.1482	0.0284	- 0.6418	0.2658	- 0.1745
271	10.5289	1.4808	8.7173	22.6702	55.7684
280	1.6223	- 1.0271	0.7760	1.4652	2.9898
291	0.0050	0.0283	- 0.0096	0.0377	0.0673
293	0.3962	0.0365	0.0025	0.5889	0.6538
300	5.8314	- 0.5415	- 2.0447	9.6524	13.6777
311	41.5803	58.6741	- 171.9269	160.1191	327.1567
312	6.5583	- 1.7416	26.9453	14.0675	49.3087
313	8.9527	1.4180	37.9312	16.0421	123.3115
319	23.5634	- 10.6448	7.1711	37.0533	76.3828
321	35.1469	59.3060	- 82.5213	153.7804	497.5824
329	0.3871	0.1567	0.3839	0.7836	3.5272
331	2.7140	- 2.6879	5.9246	2.0050	9.4898
332	1.3011	0.3387	0.1989	2.5763	5.3261
333	- 0.0066	0.0621	- 0.0367	0.0527	0.0367
334	- 0.0214	0.2089	0.0250	0.1741	0.2751
339	2.3715	0.7317	0.7511	3.9270	8.0675
341	- 93.2420	10.7085	- 122.4449	- 139.6808	- 403.0280
342	75.2235	12.6826	- 21.6118	157.6977	184.6995
350	27.7677	16.7696	- 11.0326	56.5809	78.3894

Contd.

Table 5.13 : *(Continued)*

(Rs. in crores at current prices)

ASI Code No.	1965-1960	1970-1965	1975-1970	1970-1960	1975-1960
360	107.3260	176.5382	111.2317	316.4764	743.5502
370	48.1253	90.0862	- 13.6852	178.1078	336.9803
381	- 4.0087	5.8177	4.2872	- 0.5068	2.7747
382	14.0296	18.9691	- 6.9324	34.9948	38.8153
383	34.4584	21.4273	- 5.9584	68.3302	121.6892
384	—	—	—	—	—
385	2.0832	1.6822	- 0.1047	6.0642	8.3585
386	4.5148	- 7.7111	- 8.5330	0.1387	- 8.2559
391	5.3833	3.8157	- 3.4417	14.5534	14.4451
392	1.3783	- 0.4839	1.9927	- 0.9087	1.3398
393	3.5562	0.1042	- 0.0755	6.2546	14.0096
394	- 1.9737	- 17.4518	0.9697	- 24.9359	- 53.5399
399	3.1430	- 0.3324	- 2.4968	4.5242	0.0635
511	—	—	—	—	—
TOTAL	405.6555	491.8659	- 204.7014	1223.3643	2542.8773

Table 5.14 : SHARE OF IMPORT-SUBSTITUTION IN THE CHANGE IN PRODUCTION (AT THREE-DIGIT LEVEL OF ASI CLASSIFICATION)

(current price data)

ASI Code No.	1965-1960	1970-1965	1975-1970	1970-1960	1975-1960
202	0.3506	0.1414	0.0123	0.3592	0.3478
203	0.8020	- 2.3027	- 0.2324	0.7230	0.6472
204	0.0138	+ 0.0012	- 0.0028	0.0128	0.0110
205	0.3969	0.2557	0.2492	0.0079	0.1845
206	0.0003	- 0.0002	- 0.0014	- 0.0004	0.0101
207	- 0.0014	0.0000	- 0.0006	- 0.0008	0.0009
208	0.1134	+ 0.5583	0.1039	- 0.0175	0.0711
209	0.0313	- 0.4449	0.0337	- 0.0034	0.0138
211	0.2173	0.0665	0.0267	0.1504	0.1099
212	0.1804	0.0087	- 0.0022	0.1806	0.1784
213	0.0544	0.0049	- 0.0022	0.0265	0.0217
214	- 0.0014	0.0023	0.0000	0.0004	0.0006
220	- 0.0020	0.0025	- 0.0020	0.0001	0.0004
231	0.0266	0.0406	- 0.0006	0.0399	0.0319
232	0.0019	0.0002	- 0.0058	0.0017	0.0014
233	- 0.0763	0.3084	0.0286	0.0943	- 0.0787
239	0.1908	0.2090	- 0.0098	0.2284	0.1662
241	0.0001	- 0.0166	0.0607	- 0.0053	0.0003
243	- 0.0021	- 0.0119	+ 0.0040	- 0.0871	0.0585
251	0.3475	0.1189	0.0038	0.3331	0.2532
252	0.0135	- 0.0025	- 0.0132	0.0587	0.0024
259	0.1691	0.3788	- 0.0100	0.2239	0.1740
260	0.0118	0.0021	- 0.0246	0.0103	0.0034
271	0.2102	0.0126	0.0338	0.1353	0.1310
280	0.0399	- 0.0206	0.0104	0.0162	0.0181
291	0.0006	0.0013	- 0.0002	0.0012	0.0008
293	0.7861	0.1074	0.0208	0.6977	0.6782
300	0.0871	- 0.0055	- 0.0143	0.0580	0.0439
311	0.2517	0.1362	- 0.1335	0.0027	0.1737
312	0.2143	- 0.0359	0.3517	0.1777	0.3165
313	0.7587	0.0797	0.1674	0.5419	0.4812
319	0.1665	- 0.0400	0.0152	0.0908	0.0867
321	1.0150	0.3005	- 0.1194	0.6629	0.5390
329	0.0111	0.0065	0.0022	0.0133	0.0149
331	0.2395	- 0.1559	0.1459	0.0702	0.1372
332	0.0859	0.0149	0.0037	0.0681	0.0584
333	0.0009	0.0111	0.0049	0.0040	0.0018
334	0.0004	0.0031	0.0003	0.0014	0.0014
339	0.0869	0.0383	0.0119	0.0846	0.0738
341	0.2549	0.0269	0.1338	0.1830	0.2401
342	1.0962	0.1057	0.4236	0.8361	0.7708
350	0.2912	0.1911	0.0818	0.3090	0.2465
360	0.5239	0.6692	0.1688	0.6755	0.6595
370	0.2545	0.2732	0.0234	0.3433	0.3050

contd.

Table 5.14 : *(Continued)*

(current price data)

ASI Code No.	1965-1960	1970-1965	1975-1970	1970-1960	1975-1960
381	- 2.2477	0.3310	0.0539	- 0.0262	0.0280
382	0.1572	0.4746	- 0.1145	0.2709	0.2046
383	0.2305	0.1814	- 0.0181	0.2553	0.2039
384	—	—	—	—	—
385	0.0798	0.0295	- 0.0025	0.0730	0.0667
386	0.7315	- 3.6373	- 1.2439	0.0167	- 0.5449
391	0.4963	0.2095	- 0.8507	0.5009	0.4364
392	0.8580	- 0.0642	- 0.2935	- 0.0993	0.5686
393	0.7915	0.0293	- 0.0073	0.7773	0.7640
394	- 0.7993	- 9.8005	0.0862	- 5.8673	- 3.4542
399	0.1118	- 0.0135	0.0688	0.8579	0.0037
511	—	—	—	—	—

Table 5.15 : CONTRIBUTION OF EXPANSION IN DEMAND TO GROWTH IN INDUSTRIAL PRODUCTION (WITH PRODUCTION/AVAILABILITY RATIO ASSUMED CONSTANT) AT THREE-DIGIT LEVEL OF ASI CLASSIFICATION.

(Rs. in crores at current prices)

ASI Code No.	1965-1960	1970-1965	1975-1970	1970-1960	1975-1960
202	16.2426	73.4385	187.1820	70.7697	195.6938
203	0.9905	1.4000	5.5869	1.5030	3.8413
204	2.5757	8.1291	13.3770	10.6133	23.8271
205	41.8354	51.1377	- 4.0814	97.8737	93.8086
206	12.8941	21.8607	32.3362	34.7591	67.1051
207	112.6793	256.7259	300.7197	369.5337	670.4039
208	2.4719	- 0.2642	7.6609	2.2284	9.9754
209	217.5057	284.3318	459.2332	498.4588	958.6075
211	1.0677	2.9616	89.1657	3.8542	85.5860
212	6.6381	10.6957	16.3356	15.4779	28.9124
213	0.9319	6.9427	14.3116	7.7512	21.7605
214	5.0327	13.4339	13.3200	18.4827	31.7908
220	68.1752	98.2499	62.4553	166.5137	228.9627
231	547.7800	676.7095	1157.6338	1217.4566	2347.7361
232	4.3729	5.5638	10.6110	9.9294	20.5256
233	1.7995	1.0166	50.6028	2.8458	50.8865
239	31.8569	25.9291	106.0846	55.6708	147.7542
241	5.1637	2.5250	33.6446	7.6883	41.4852
243	6.1188	8.8236	- 13.2595	14.9547	1.6002
251	8.1476	3.9012	36.1939	11.2796	39.7601
252	0.4735	1.0226	1.7934	1.4912	3.2779
259	1.7027	0.3223	3.2634	1.9931	4.7904
260	12.4447	13.2518	26.7553	25.6073	52.1611
271	39.5550	115.9485	249.4667	144.8430	369.9288
280	39.0648	50.9967	74.1472	89.1915	162.5901
291	8.1421	22.3659	48.8930	30.5036	79.3574
293	0.1078	0.3035	0.1175	0.2551	0.3102
300	61.1238	99.8861	147.1551	156.6474	297.7025
311	123.6137	372.1836	1459.3136	435.9326	1556.2817
312	24.0460	50.3198	49.6765	65.1150	106.4956
313	2.8479	16.3843	188.7159	13.5608	132.9385
319	117.9965	277.0295	465.9618	370.8913	804.6947
321	- 0.5197	138.0637	773.6549	78.2165	425.5481
329	34.3359	23.8513	176.8561	57.9474	232.4438
331	8.6166	19.9311	34.6807	26.5688	59.6893
332	13.8449	22.3389	53.1798	35.2473	85.8762
333	7.4631	5.5102	7.5487	12.9761	20.5041
334	53.4827	66.9881	75.9350	120.4842	196.3432
339	24.9317	18.3875	62.2012	42.4954	101.3072
341	459.0104	386.8639	1037.9143	903.0216	2081.8382
342	- 6.6045	107.3048	72.6332	30.9087	54.9283
350	67.5774	70.9640	145.9189	126.4978	239.5756

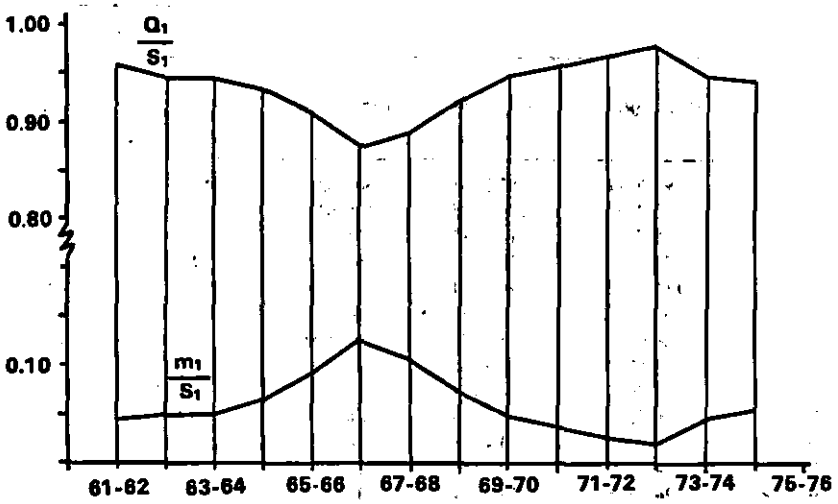
contd.

Table 5.15 : *(Continued)*

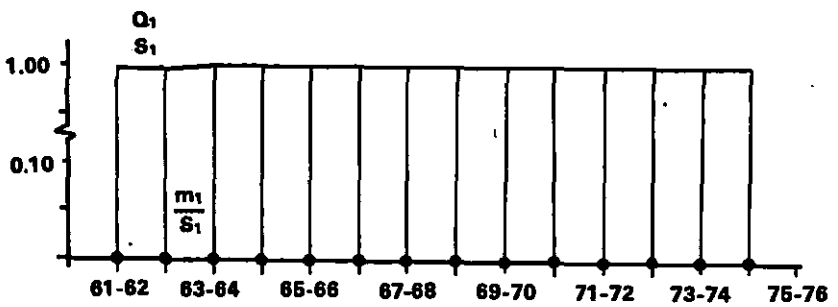
(Rs. in crores at current prices)

ASI Code No.	1965-1960	1970-1965	1975-1970	1970-1960	1975-1960
360	97.5311	87.2636	547.6244	152.1825	383.9648
370	140.9753	239.6715	599.6233	340.7505	767.8161
381	5.7922	11.7585	75.2784	19.8665	96.1506
382	75.2079	20.9967	67.4677	94.2085	150.9233
383	115.0115	96.7174	335.0306	199.2844	474.9976
384	31.8782	31.0388	69.1566	62.9170	132.0736
385	24.0358	55.2878	42.3580	77.0248	116.9838
386	1.6570	9.8311	15.3930	8.1531	23.4077
391	5.4631	14.3949	7.4872	14.5036	18.6574
392	0.2282	8.0239	– 8.7827	10.0552	1.0167
393	0.9369	3.4488	10.3655	1.7915	4.3265
394	4.4430	19.2325	10.2803	29.1859	69.0399
399	24.9678	24.9594	– 33.8005	48.2136	16.3770
511	292.3350	454.7657	433.1863	747.1007	1180.2870
TOTAL	3008.0002	4511.1208	9905.5642	7193.2781	15574.6279

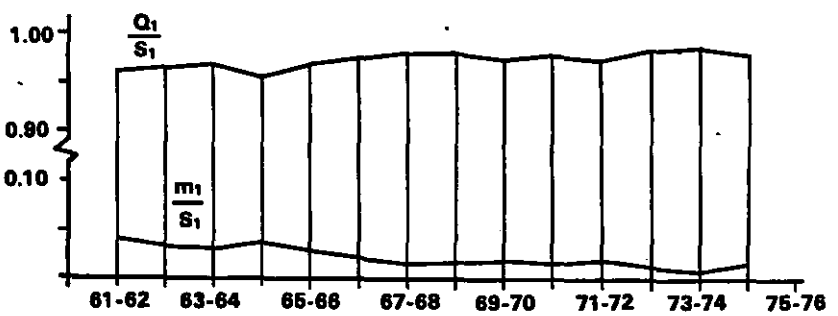
FOOD AND BEVERAGES (20-21)



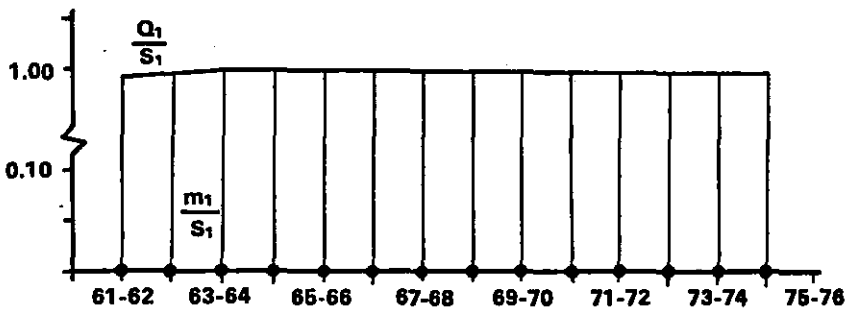
TOBACCO (22)



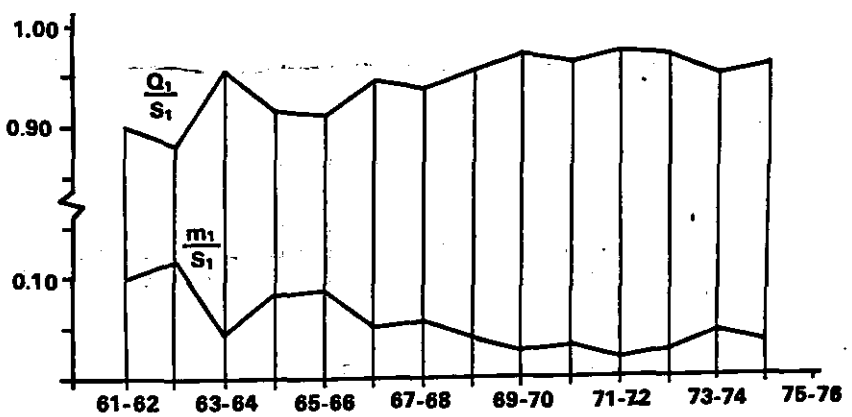
TEXTILES (23)



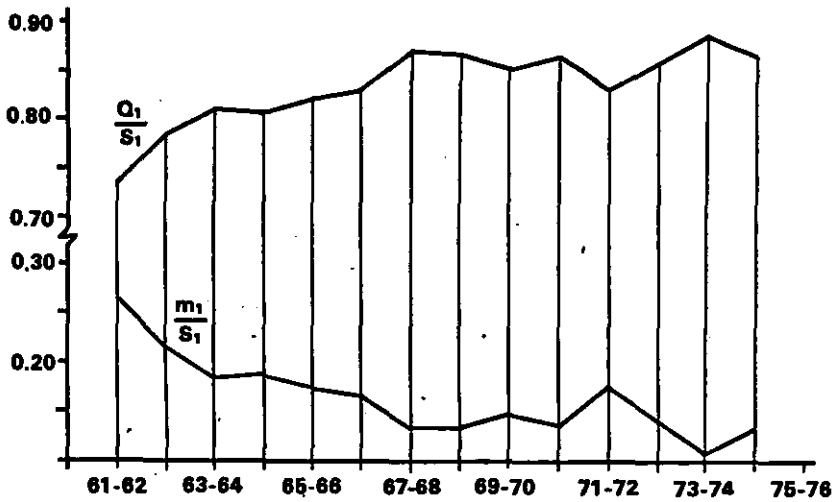
FOOTWEAR, OTHER WEARING APPAREL AND, MADE UP TEXTILE GOODS (24)



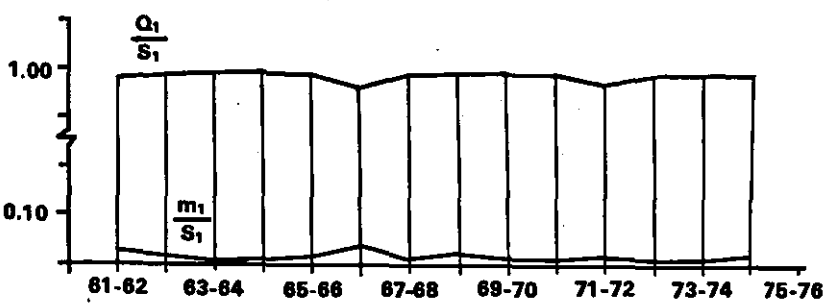
WOOD AND CORK (EXCEPT FURNITURE) (25)



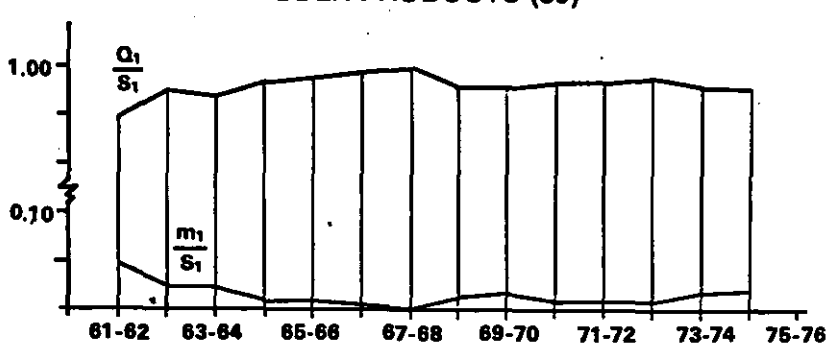
PAPER AND PAPER PRODUCTS (27)



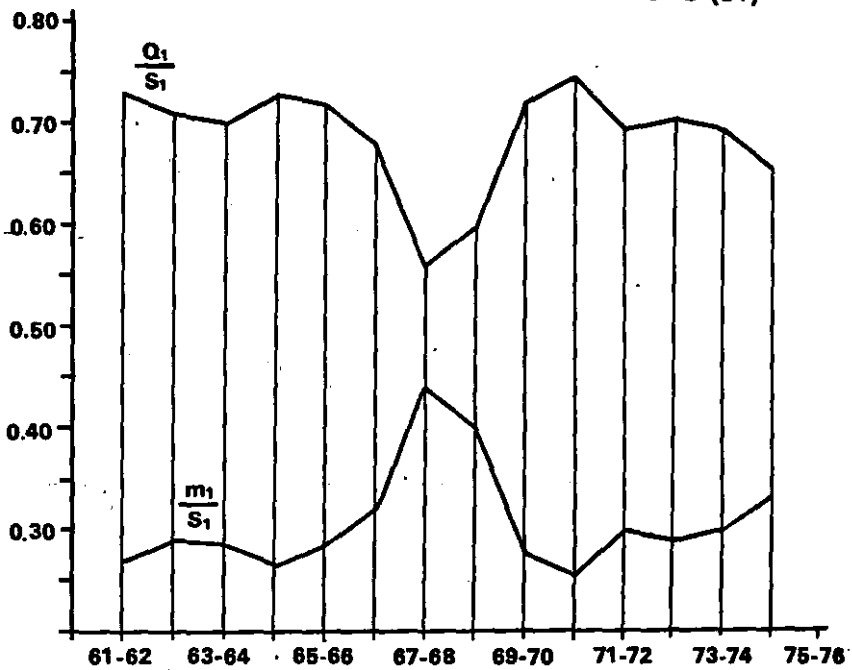
LEATHER AND FUR PRODUCTS EXCEPT FOOTWARE AND OTHER WEARING APPAREL (29)



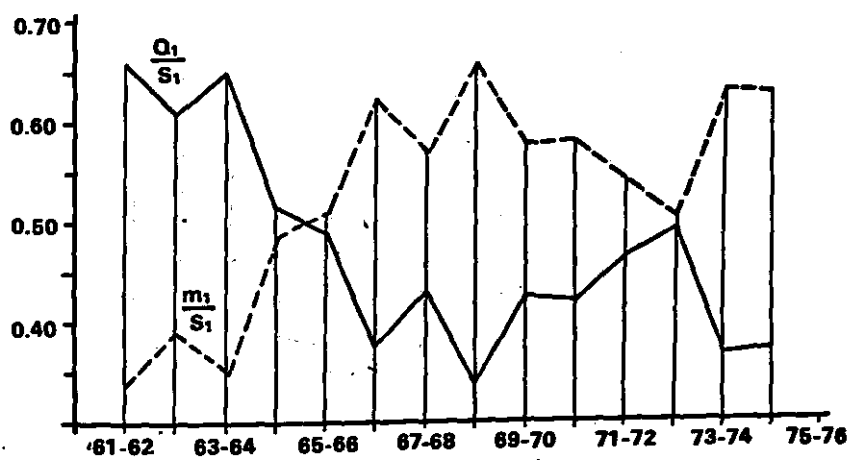
RUBBER PRODUCTS (30)



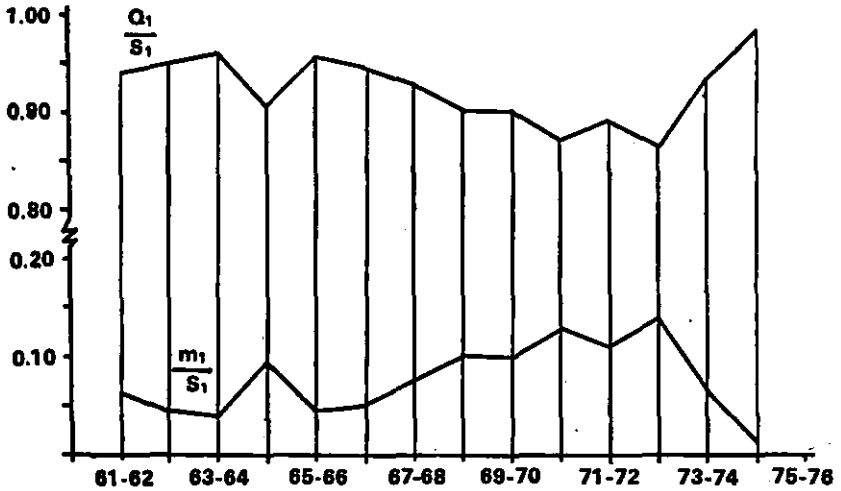
CHEMICALS AND CHEMICAL PRODUCTS (31)



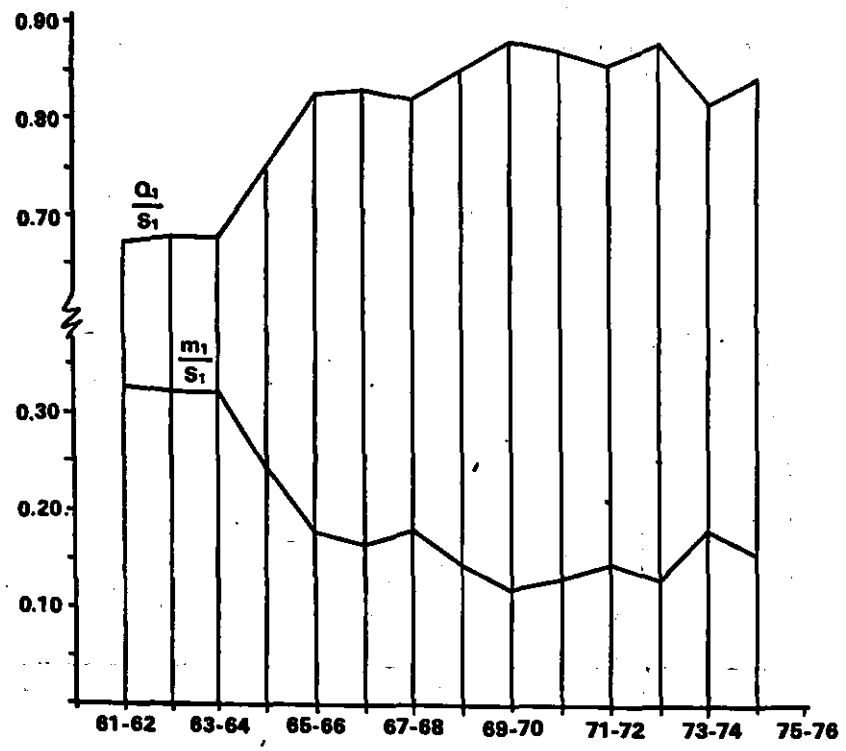
PETROLEUM AND COAL PRODUCTS (32)



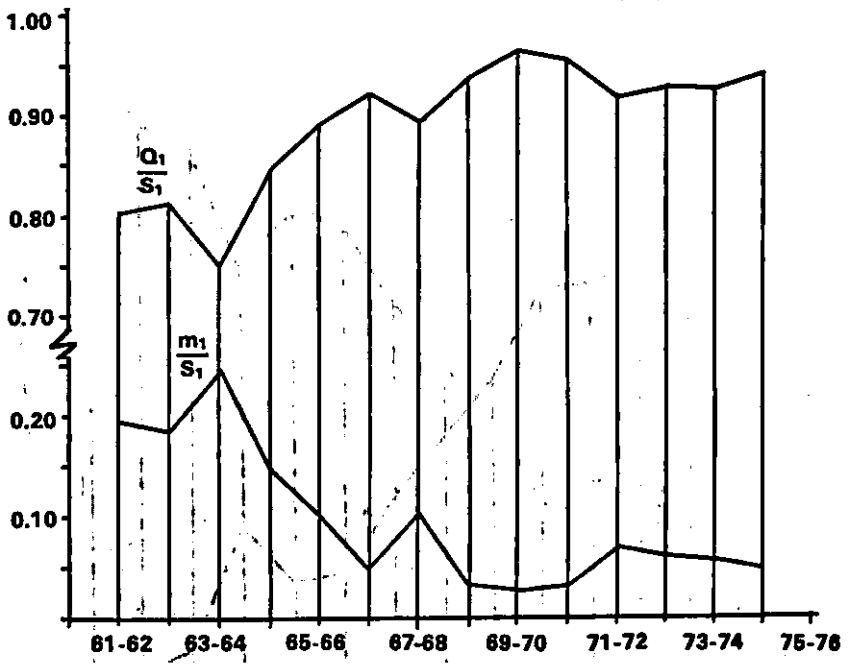
NON-METALLIC MINERAL PRODUCTS EXCEPT PRODUCTS OF PETROLEUM AND COAL (33)

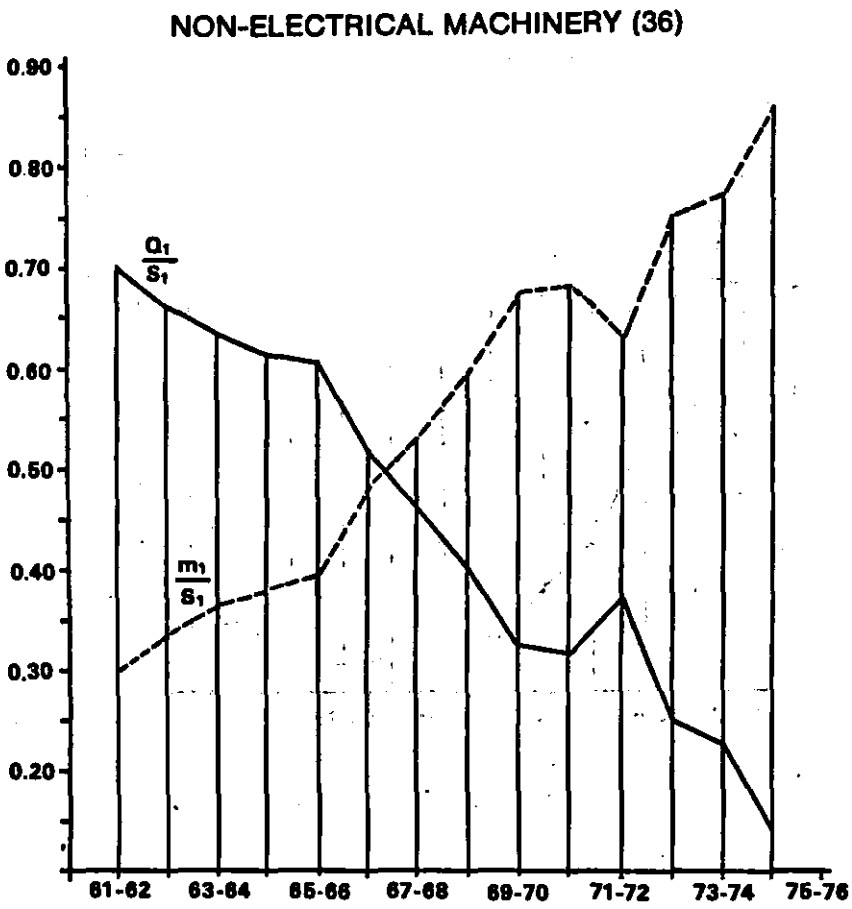


BASIC METALS (34)

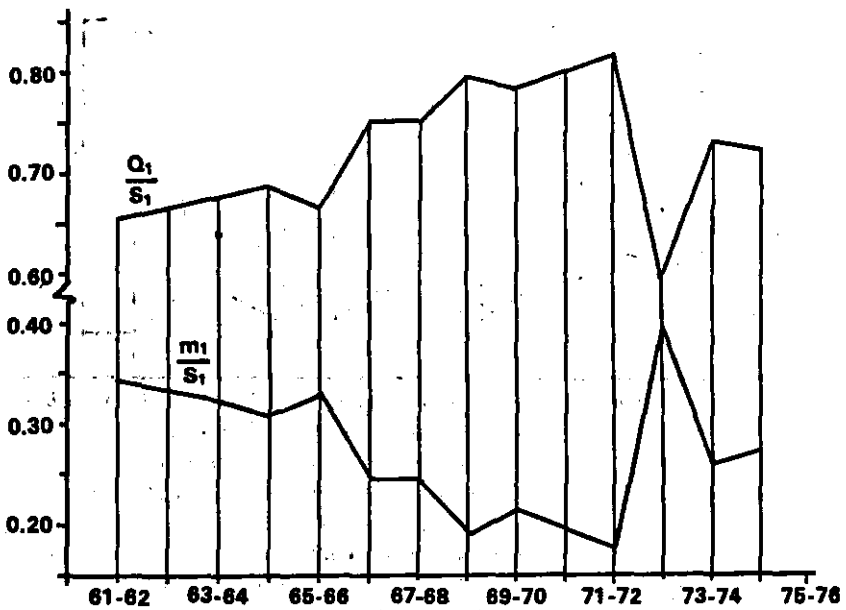


METAL PRODUCTS EXCEPT MACHINERY AND TRANSPORT EQUIPMENT (35)

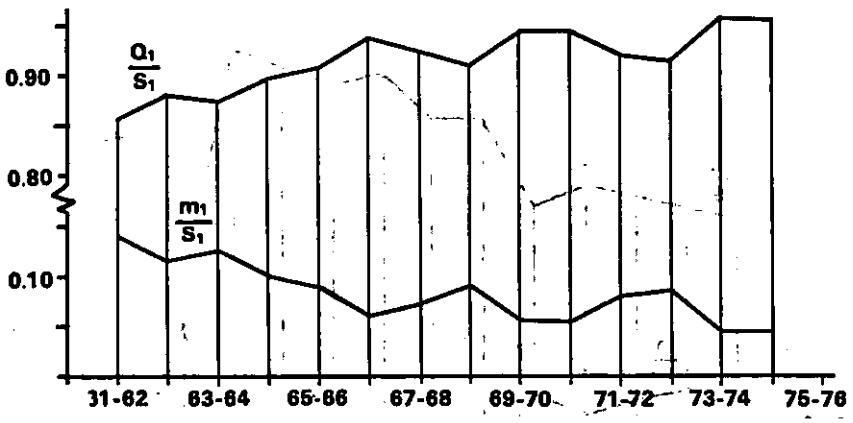



NON-ELECTRICAL MACHINERY (36)
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
$\frac{Q_1}{S_1}$
$\frac{m_1}{S_1}$
61-62
63-64
65-66
67-68
69-70
71-72
73-74
75-76

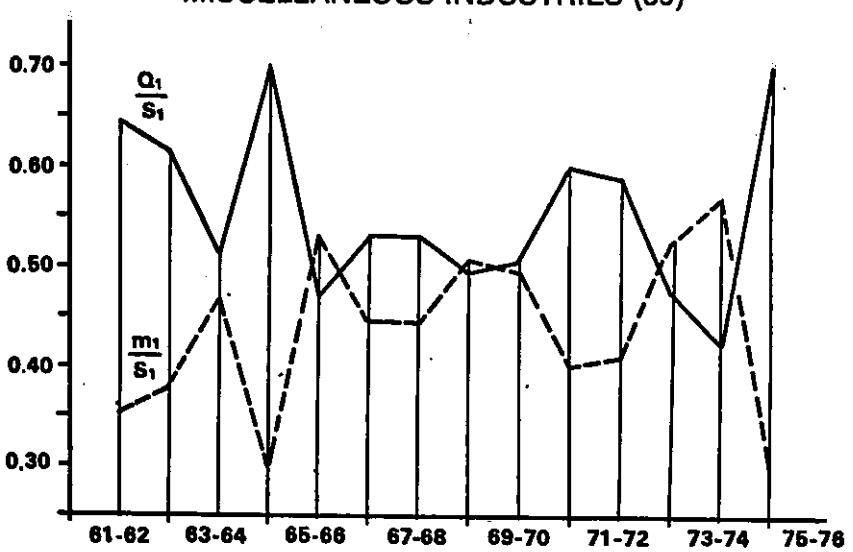
ELECTRICAL MACHINERY (37)



TRANSPORT EQUIPMENT (38)



MISCELLANEOUS INDUSTRIES (39)



CHAPTER VI

IMPORT AND PRODUCTION ELASTICITIES—I

In the course of the last two chapters we have obtained the details of structural changes and import substitution in Indian industry during 1960-75. In the case of structural change analysis we had to confine to the two-point data i.e. 1960 and 1975. For the analysis of import substitution, we made a four-point comparison of 1960, 1965, 1970 and 1975. So, the results obtained there need not necessarily reflect the influence of trend factors and may as well be the consequence of the specific values of the years chosen. We, therefore, thought of looking at industrial production and imports from the point of view of time-serial trend movements and examining whether the results obtained are consistent with our observations in the chapters IV and V. In this chapter we use trend growth rates in industrial imports and production in studying these behaviour patterns of different industrial groupings in the total industrial production and imports.

The trend growth rates of the various groups of industrial imports and industrial production divided by the trend growth rate of some overall indicator of economic activity over a certain chosen period provide us with elasticity parameters.[1] Since we are interested in the relationships from the manufacturing sector over to imports we have chosen total industrial production as the economic activity variable.

The elasticity parameters that we have obtained are useful for both descriptive and predictive purposes. They serve, firstly, to describe the structure of imports and production. Secondly, the import-elasticity parameters are indicators of categorywise import dependence. Over time, they can be said to be a sort of dynamised version of conventional static import-GNP ratio measure of trade-dependence.

These elasticity parameters can also be used for making projections about future import requirements. Of course, it is possible that the extrapolation of these historical results, however, may not give realistic results if the trends of the past do not continue, and if structural changes occur in future.

Results

We have calculated import- and production- elasticity parameters at both

the two- and three- digit levels of the ASI classification.

Import-Elasticity Parameters

(i) At Two-digit Level of the ASI Classification (see table 6.1)

During the period 1960-65 all the import-elasticities were less than one. This is also the period of intensive import substitution. Some of the groups actually had negative import-elasticities. These groups were Beverages (21), Textiles (23), Wood and Cork (25), Paper and Paper Products (30), Petroleum and Coal Products (32), Non-metallic Mineral Products (33) and Metal Products except Machinery and Transport Equipment (35). These are mainly traditional industries having small pull on imports.

During 1965-70 there were just two groups with import-elasticities greater than unity—Foot-wear, Other than Wearing Apparel and Made-up Textile Goods (24) and Rubber Products (30). But this period as many as twelve groups had negative import-elasticities. They were Food (20), Beverages (21), Tobacco (22), Textiles (23), Wood and Cork (25), Leather and Fur Products (29), Petroleum and Coal Products (32), Non-metallic Mineral Products (33), Metal Products except Machinery and Transport Equipment (35), Non-electrical Machinery (36), Electrical Machinery, Apparatus, Appliances and Supplies (37) and Transport Equipment (38). One can easily observe that, quite a few industries had recorded a similar trend in the earlier period. This was the period in which the forces of import substitution were at their strongest.

During the period 1970-75 the groups that had import-elasticities greater than unity were Beverages (21), Tobacco (22), Rubber Products (30), Petroleum and Coal Products, Metal Products except Machinery and Transport Equipment (35), Non-electrical Machinery (36) and Electrical Machinery, Apparatus, Appliances and Supplies (37). During this period not a single import-elasticity was negative. As our results on import-substitution show the period 1970-75 was a period in which import-substitution was largely negative.

Despite the increase in import-bias during the last period, all but one import-elasticity was less than unity for the entire period 1960-75. The lone exception was Foot-wear (24)—a minor import that not even once during the period 1960-75 reached Rs. 1 crore in value.

(ii) At Three-digit Level of the ASI Classification (see table 6.3)

The study of import-elasticities at this level supports our findings at the two-digit level. There have been some stray movements at the three-digit level. At times they are reflected in the movements at the two-digit level;—at other times the movements are not strong enough to affect the movements at the two-digit level.

During the period 1960-75 most groups had import-elasticities of less than unity. The exceptions to this were Grain Mill Products (205), Bakery Products (206), Soft Drinks (214), Cordage, Rope and Twine Industries (233), Wearing Apparel (243), Vegetable and Animal Oils and Fats (312), Iron and Steel Basic Industries (341), Ship-building and Repairing (381) and Jewellery and Related

Articles (394) which experienced elasticities greater than unity. These exceptions, however, have not been strong enough to affect import elasticities at the two-digit level where all groups had import-elasticities that were less than unity. During this period as many as twenty-five groups had negative import-elasticities.

During the period 1965-70 only seven groups had import-elasticities that were greater than unity—Canning and Preserving of Fish and Seafoods (204), Cocoa, Chocolate and Sugar Confectioneries (208), Foot-wear (241), Wearing Apparel (243), Rubber Products (300), Vegetable and Animal Oils and Fats (312) and Structural Clay Products (331). This tallies with our observations in Chapter IV where we show that high income groups exercise a pull on luxury imports. During this period as many as twenty-six groups had negative import-elasticities. These results are again consistent with our results on import-substitution, this period, 1965-70, was also the period when the forces of import-substitution were at their strongest.

During the period 1970-75 as many as nineteen groups had import-elasticities that were greater than unity. These groups were Canning and Preserving of Fish and Seafoods (204), Bakery Products (206), Distilling, Rectifying and Blending of Spirits (211), Wine Industries (212), Breweries and Manufacturing of Malt (213), Tobacco (220), Cordage, Rope and Twine Industries (233), Textiles, n.e.c. (239), Tanneries and Leather Finishing Plants (291), Rubber Products (332), Iron and Steel Basic Industries (341), Metal Products except Machinery and Transport Equipment (350), Non-electrical Machinery (360), Electrical Machinery, Apparatus, Appliances and Supplies (370), Motor-cycle and bicycles (385), Aircraft (386) and Watches and Clocks (393). This observation tallies with our demonstration in chapter IV that along with the priority imports, luxury imports played a definite role. This is an indirect evidence of skew income distribution in our economy. These results are also consistent with the fact that import-substitution was exhausting itself during 1970-75. During this period only seven groups had negative import-elasticities. All this change has been so drastic that it has also affected results at the two-digit level.

Despite the increase in import-bias in 1970-75 there were very few groups that had import-elasticities that were greater than unity for the entire period 1960-75. These groups were Bakery Products (206), Sugar Factories and Refineries (207), Knitting Mills (232), Wearing Apparel (243), Iron and Steel Basic Industries (341) and Jewellery and Related Articles. However, these exceptions have not been so strong as to be reflected at the two-digit level except for Wearing Apparel (243).

Production-Elasticity Parameters

(i) At Two-Digit Level of the ASI Classification (see table 6.2)

During the period 1960-65 most traditional groups had production-elasticities that were less than unity. The exceptions were Beverages (21), Foot-wear, Other Wearing Apparel and Made-up Textile Goods (24), Wood and Cork (25) and Furniture and Fixtures (26). Among the non-traditional indus-

tries the only group that had a production elasticity that was less than one was Non-metallic Mineral Products Other than Petroleum and Coal Production (33). This supports an analysis of structural change in Chapter IV.

During the period 1965-70 the traditional industries grew at a slower place. The only groups among traditional industries that had a production-elasticity greater than unity were Beverages (21), Paper and Paper Products (27) and Leather and Fur Products (29). Among the non-traditional industries growth seems to have slowed down somewhat. The groups that have production-elasticities less than unity among the non-traditional industries are Non-metallic Mineral Products (33), Basic Metal Industries (34), Metal Products except Machinery and Transport Equipment (35) and transport Equipment (38). This means these industries lost their momentum of earlier years during this period.

During the period 1970-75 all but two of the traditional industries had production-elasticities that were less than one. The two exceptions were Paper and Paper Products (27) and Rubber Products (30). Among the non-traditional industries the groups that had production-elasticities greater than unity were Chemicals and Chemical Products (31), Petroleum and Coal Products (32), Basic Metal Industries (34), Non-electrical Machinery (36), and Electrical Machinery, Apparatus, Appliances and Supplies (37). Thus the lead of these industries was maintained in this period as it was in the earlier period.

Over the entire period 1960-75 only three traditional industries had production-elasticities that were greater than unite. They were Beverages (21), Paper and Paper Products (27) and Rubber Products (30). Among the non-traditional industries, for the same period, the following were the groups that had production-elasticities greater than unity: Chemicals and Chemical Products (31), Petroleum and Coal Products (32), Basic Metal Industries (34), Non-electrical Machinery (36), Electrical Machinery, Apparatus, Appliances and Supplies (37) and Electricity (51). Thus this set of industries can be called the core sector.

These findings are in line with our earlier results on the changing structure of industrial production.

(ii) At Three-Digit Level of the ASI Classification (see table 6.4)

During the period 1960-65 as many as thirteen of the traditional industries had production-elasticities that were greater than unity. They were Dairy Products (202), Canning and Preserving of Fruits and Vegetables (203), Canning and Preserving of Fish and Other seafoods (204), Bakery Products (206), Cocoa, Chocolate and Sugar Confectionery (208), Wine Industries (212), Soft Drinks and Carbonated Water Industries (214), Knitting Mills (232), Foot-wear (241), Wearing Apparel (243), Wood and Cork Products (251,252 and 259), Furnitures and Fixtures (260) and Leather Products except Foot-wear and Other Wearing Apparel (260). This shows which industries improved their relative position as a result of rising real incomes during the last 20 years. During the same period the following were the non-traditional industries that had production-elasticities that were greater than unity. Vegetable and Animal Oils and Fats (312), Miscellaneous Chemical Products (319), Miscellaneous Products of Petroleum and

Coal (329), Pottery, China and Earthenware (333) Non-metallic Mineral Products (339), Iron and Steel Basic Industries (342), Metal Products except Machinery and Transport Equipment (350), Non-electrical Machinery (360), Electrical Machinery, Apparatus, Appliances and Supplies (370), Motor Vehicles (383), Repair of Motor Vehicles (384), Motor Cycles and Bicycles (385), Professional and Scientific Measuring and Controlling Instruments (391), Photographic and Optical Goods (392), Watches and Clocks (393), Industries n.e.c. (399) and Electric Light and Power (511). Many of these are capital and intermediate goods industries. Some portion of each of them was earmarked for final consumption.

During the period 1965-70 there was a slight reduction in the number of groups of traditional industries with less than unit production-elasticities. The following were the groups : Dairy Products (202), Canning and Preservation of Fish and Other Seafoods (204), Bakery Products (206), Sugar Factories and Refineries (207), Wine Industries (212), Breweries and Malt (213), Soft Drinks and Carbonated Water Industries (214), Knitting Mills (232), Wearing Apparel (243), Paper and Paper Products (271) and Tanneries and Leather Finishing Plants (291). We have seen earlier that output of some of these industries was supplemented by liberal imports. This shows how income-distribution geared to favour high income-groups cannot fail to exercise its influence on import policy. During the same period there were also fewer groups within non-traditional industries that had production-elasticities that were greater than unity. They were Basic Industrial Chemicals including Fertilizers (311), Vegetable and Animal Oils and Fats (312), Miscellaneous Chemical Products (319), Petroleum Refineries (321), Non-ferrous Basic Metal Industries (342), Non-electrical Machinery (360), Electrical Machinery, Apparatus, Appliances and Supplies (370), Ship-building and Repairing (381), Motor Cycles and Bicycles (385), Professional and Scientific Measuring and Controlling Instruments (391), Photographic and Optical Goods (392), Watches and Clocks (393) and Electric Light and Power (511).

During the period 1970-75 the following were the traditional industries that had greater than unit production elasticities ; Dairy Products (202), Canning and Preserving of Fruits and Vegetables (203), Canning and Preserving of Fish and Other Seafoods (204), Bakery Products (206), Distilling, Rectifying and Blending of Spirits (211), Knitting Mills (232), Cordage, Rope and Twine Industries (233), Textiles n.e.c. (239), Foot-wear (241), Paper and Paper Products (271), Leather Products except Foot-wear and Other Wearing Apparel (293) and Rubber Products (300). It is easy to see how some luxury industries have received a strong impetus from the economic growth during this and previous periods. Among the non-traditional industries the following industries had production-elasticities that were greater than unity : Basic Industrial Chemicals including Fertilisers (311), Vegetable and Animal Oils and Fats (312), Paints, Varnishes and Lacquers and Miscellaneous Chemical Products (313 and 319), Petroleum Refineries (321), Miscellaneous Petroleum and Coal Products (329), Structural Clay Products (331), Non-metallic Mineral Products, n.e.c. (339), Iron and Steel Basic Industries (341), Non-electrical Machinery (360),

Electrical Machinery, Apparatus, Appliances and Supplies (370), Ship-building and Repairing (381), Motor Vehicles (383), Repair of Motor Vehicles (384) and Watches and Clocks (393).

Over the entire period 1960-75, the following traditional industry groups had production-elasticities that were greater than unity : Dairy Products (202), Canning and Preserving of Fruits and Vegetables (203), Canning and Preserving of Fish and Other Seafoods (204), Bakery Products (206), Distilling, Rectifying and Blending of Spirits (211), Wine Industries (212), Breweries and Malt (213), Soft Drinks and Carborated Water Industries (204), Knitting Mills (232), Cordage, Rope and Twine Industries (233), Textiles n.e.c. (239), Foot-wear (241), Paper and Paper Products (271), Leather Products except Foot-wear and Other Wearing Apparel (293), and Rubber Products (300). The following were the groups among the non-traditional industries that had greater than unit production-elasticities : Basic Industrial Chemicals including Fertilisers (311), Vegetables and Animal Oils and Fats (312), Paints, Varnishes and Lacquers and Miscellaneous Chemical Products (313 and 319), Petroleum Refineries (321), Miscellaneous Petroleum and Coal Products (329), Iron and Steel Basic Industries (341), Non-ferrous Basic Metal Industries (342), Non-electrical Machinery (360), Electrical Machinery, Apparatus, Appliances and Supplies (370), Repair of Motor Vehicles (384), Motor Cycles and Bicycles (385), Professional and Scientific Measuring and Controlling Instruments (391), Photographic and Optical Goods (392), Watches and Clocks (393) and Electric Light and Power (511).

The above four paragraphs give us an idea of the pattern of industrial growth at a more disaggregated level. It can be seen to be quite in keeping with the general lines of industrial growth as experienced elsewhere.[2] It must be noted that most of the groups in the traditional sector that have production-elasticities of greater than unity are actually groups that employ fairly modern techniques of production. similarly, many non-traditional industries play a decisive role in the process of industrial transformation. Moreover, we do get some basic evidence regarding the growth and development of quite a few luxury industries. This is an indirect evidence on how income distribution has tilted the pattern of output. This is also what we found in our Chapter IV of structural analysis of industrial production and imports.

References :

1. The methodology used in this chapter is based on that used on a study by the Secretariat of the Economic Commission for Europe. The study 'Trade-dependence in European countries' appeared in *Economic Bulletin for Europe*, Vol. 21, No. 1, pp. 43-65.

2. See Chapter 1.

Table 6.1 : IMPORT-ELASTICITIES (AT THE TWO-DIGIT LEVEL OF THE ASI CLASSIFICATION)

(current price data)

Code Nos.	1960-65	1965-70	1970-75	1960-75
20	0.7522	- 0.1202	0.2871	0.1918
21	- 0.4298	- 0.1608	1.7098	- 0.2186
22	0.6806	- 2.3989	3.5829	- 0.1539
23	- 0.0990	- 2.1315	0.8774	- 0.5081
24	0.8909	4.5202	0.0494	1.6739
25	- 0.9775	- 1.3657	0.2871	- 0.5657
26	0.2787	0.2877	0.7017	0.2649
27	- 0.0046	0.4975	0.9287	0.2755
28	0.3634	0.5077	0.7448	0.2902
29	- 1.6548	- 1.0628	0.9318	- 0.3661
30	- 1.3859	1.5561	1.5403	0.1609
31	0.1537	0.5822	0.6729	0.4230
32	- 0.7763	- 0.0110	3.0369	- 0.0401
33	- 0.2957	- 0.0990	0.1107	0.0857
34	0.0528	0.0051	0.7498	0.3092
35	- 04656	- 1.5113	1.5779	0.9143
36	0.6916	- 0.8969	1.0619	0.0654
37	0.6890	- 0.9536	1.1976	0.1279
38	0.1257	- 0.7768	0.9925	0.0021
39	0.4122	0.1345	0.6448	0.1174

Notes : 1. Import elasticity = $\frac{\text{Individual Growth Rate of Import}}{\text{Overall Industrial Growth Rate}}$

2. For years 60-65 and 65-70, compound growth rates (by regression) of total industrial production have been used and for years 70-75 and 60-75 compound growth rates (two point) of total industrial production have been used.

Table 6.2 : PRODUCTION-ELASTICITIES (AT THE TWO-DIGIT LEVEL OF THE ASI CLASSIFICATION)

(current price data)

Code Nos.	1960-65	1965-70	1970-75	1960-75
20	0.6571	0.8972	0.7905	0.8074
21	1.7180	1.7291	0.6560	1.2902
22	0.8292	0.8943	0.8555	0.7519
23	0.6874	0.6944	0.6604	0.6950
24	1.8618	0.9599	0.1513	0.9037
25	1.1589	0.3464	0.7580	0.7505
26	1.2056	0.8380	0.7217	0.8911
27	0.7938	1.2827	1.0544	1.0485
28	0.7693	0.7456	0.5097	0.6564
29	0.5627	1.1504	0.9656	0.6648
30	0.9728	0.9957	1.0807	1.0141
31	1.2762	1.5278	1.5547	1.4462
32	1.2210	1.9645	2.1964	1.7948
33	0.9556	0.7984	0.9869	0.9410
34	1.2395	0.9395	1.1313	1.1307
35	1.2437	0.7586	0.6473	0.9016
36	1.8482	1.1777	1.1789	1.3486
37	1.5401	1.3911	1.1876	1.3753
38	1.0466	0.6632	0.8993	0.8981
39	1.4864	1.0052	−0.1901	0.6908
51	2.4193	1.4767	0.8624	1.4519

Notes : 1. $\text{Production-elasticity} = \dfrac{\text{Individual Growth Rate of Production}}{\text{Overall Industrial Growth Rate}}$

2. For years 60-65 and 65-70, compound growth rates (by regression) of total industrial production have been used and for years 70-75 and 60-75 compound growth rates (two point) of total industrial production have been used.

Table 6.3 : IMPORT ELASTICITIES (AT THE THREE-DIGIT LEVEL OF THE ASI CLASSIFICATION)

(current price data)

Code Nos.	1960-65	1965-70	1970-75	1960-75
202	0.2950	0.0228	0.9650	0.3591
203	0.1153	0.4299	0.8593	0.2804
204	- 0.8981	1.5519	2.1545	0.3598
205	1.1241	- 0.6803	0.2214	- 0.2291
206	1.1423	0.1955	1.2996	3.3324
207	- 0.0078	0.4256	- 0.2564	3.6121
208	0.0000	1.3894	0.8155	0.5720
209	0.5712	0.6380	- 0.0457	0.3935
211	- 0.3836	- 0.0652	1.5754	- 0.1989
212	- 0.3113	- 0.4849	1.9719	- 0.0513
213	- 1.6965	- 2.1586	3.8937	- 0.7639
214	4.1075	- 5.2014	- 0.3515	- 1.7920
220	0.6806	- 2.3989	3.5829	- 0.1539
231	- 0.1465	- 1.9445	0.7242	- 0.5130
232	- 0.7932	0.0262	0.5572	1.8616
233	1.5038	- 2.9176	1.3458	- 0.8911
239	- 0.1439	- 2.7737	1.3971	- 0.5334
241	- 0.6298	5.6084	- 3.3052	- 0.9726
243	1.1254	4.2224	0.2583	1.8742
250	- 0.9775	- 1.3657	0.2871	- 0.5657
260	0.2787	0.2877	0.7017	0.2649
271	- 0.0046	0.4975	0.9287	0.2755
280	0.3634	0.5077	0.7448	0.2902
291	- 0.0143	- 0.6871	1.0344	0.1405
293	- 2.3152	- 1.6636	0.5353	- 0.8939
300	- 1.3859	1.5561	1.5403	0.1609
311	0.3953	0.3825	0.8437	0.3970
312	1.1045	1.5223	- 0.5253	0.8103
319	- 0.5256	0.5627	0.7880	0.2270
321	- 0.7796	- 0.0102	3.0432	- 0.0401
329	0.6200	0.1811	0.2289	0.1799
331	- 0.9241	1.8396	- 1.0788	0.0984
332	- 0.1088	- 0.4121	1.0544	0.2312
333	0.3419	- 1.1017	0.7405	0.1026
334	- 0.2950	- 2.9777	- 4.6760	- 3.1061
339	0.0065	- 0.7505	0.5741	0.0098
341	12.1616	- 0.0762	1.0613	5.2734
342	- 0.7294	0.1151	0.1795	- 0.3739
350	- 0.4656	- 1.5113	1.5779	0.9143
360	0.6916	- 0.8969	1.0619	0.0654
370	0.6890	- 0.9536	1.1976	0.1279
381	2.7099	- 0.7776	0.8793	0.0590
382	0.4611	- 1.3107	0.8280	- 0.1391
383	0.0059	- 1.0332	0.8887	- 0.1595
385	- 1.0042	- 2.6426	1.7598	- 1.0056
386	- 0.3810	0.6930	1.1976	0.5228
391	0.5842	0.0787	0.7942	0.2600
392	0.0853	0.5415	0.2983	0.3268
393	- 0.9704	0.1828	1.5335	0.0450
394	23.2317	- 2.0266	0.5297	6.8454
399	-0.4409	0.3723	0.9162	-0.4287

Table 6.4 : PRODUCTION-ELASTICITIES (AT THE THREE-DIGIT LEVEL OF THE ASI CLASSIFICATION)

(current price data)

Code Nos.	1960-65	1965-70	1970-75	1960-75
202	1.9778	2.4165	1.5578	1.8384
203	2.3930	0.1105	1.0600	1.1096
204	2.8164	2.4706	1.6948	2.1729
205	0.3700	0.7797	0.5197	0.6507
206	1.3707	1.2998	1.0113	1.1876
207	0.6201	1.0908	0.9787	0.8911
208	1.7389	- 0.2684	0.4296	0.4996
209	0.6579	0.6691	0.6992	0.7442
211	0.4271	0.8717	2.1920	1.1968
212	6.0064	1.5176	- 1.4565	1.4371
213	0.5369	2.2975	0.6692	1.2207
214	2.8794	2.2493	0.5547	1.4455
220	0.8292	0.8943	0.8555	0.7519
231	0.6794	0.7029	- 0.9450	0.0365
232	1.7044	1.1315	1.1395	1.3823
233	0.6574	0.5042	4.1551	1.8131
239	0.7686	0.5313	4.9581	2.0372
241	2.4832	0.5699	2.0100	1.6142
243	1.5506	1.1964	- 1.6467	0.0759
251				
252	1.1589	0.3464	0.7580	0.7505
259				
260	1.2056	0.8380	0.7217	0.8911
271	0.7938	1.2827	1.0544	1.0485
280	0.7693	0.7456	0.5097	0.6564
291	0.5418	1.1646	0.9250	0.6465
293	1.5426	0.6421	2.8024	1.7175
300	0.9728	0.9957	1.0807	1.0141
311	0.1472	1.8339	1.8405	1.7112
312	3.1099	1.5870	1.2076	1.8566
313	0.8441	0.9345	1.2364*	1.1673*
319	1.0405	1.2435		
321	0.7584	2.3553	2.1507	1.7063
329	3.8330	0.8606	2.3784	2.3640
331	0.7361	0.8696	1.0413	0.9023
332	0.9331	0.9812	0.9106	0.9628
333	1.1799	0.6176	0.8437	0.9417
334	0.9688	0.8670	0.9437	0.9487
339	1.0165	0.5382	1.0994	0.9389
341	1.2315	0.8683	1.2020	1.1504
342	1.2844	1.2946	0.7955	1.0302
350	1.2437	0.7586	0.6473	0.9016
360	1.8482	1.7777	1.1789	1.3486
370	1.5401	1.3911	1.1876	1.3753
381	0.1205	1.1216	1.4253	0.8644
382	0.9587	0.3469	0.3696	0.5713
383	1.1556	0.6416	1.0394	0.9768

contd.

Table 6.4 : (Continued)

(current price data)

Code Nos.	1960-65	1965-70	1970-75	1960-75
384	1.5406	0.8765	1.3609	1.2410
385	1.0341	1.3881	0.6986	1.0098
386	0.8643	0.2539	0.0000	0.0000
391	2.0765	1.4971	0.8430	1.3472
392	2.1102	2.9899	- 0.4903	1.0358
393	5.3687	1.0039	1.4903	2.2178
394	0.6045	0.3981	- 0.8293	- 0.0148
399	1.3659	0.7607	0.6992	0.4357
511	2.4193	1.4767	0.8624	1.4519

* For the years 1960-65 and 1965-70, production growth rates are available separately for Groups 313 and 319. Hence elasticities are reported separately. For the years 1970-1975 (and so also for 1960-75) they are not available separately. Hence, only a single elasticity is reported for these periods.

CHAPTER VII

IMPORT AND PRODUCTION ELASTICITIES-II

In the previous chapters, we have tried to furnish different indicators of import dependence based on the comparable data of industrial production and imports. But as we have said earlier in Chapter IV, the degree of import dependence is under-estimated because many categories of imports like crude materials, petroleum and metal ores used in the manufacturing sector escape our attention since our scheme of correspondence leaves them out. In this chapter, we use the actual two-digit import classification followed in the Government of India's Monthly Statistics of Foreign Trade and catch this impact through multiple regression analysis and see whether our new results are consistent with those based on the comparable data. Similarly, we have not been able to incorporate in course of our previous exercises the influence of real GNP per capita on industrial outputs of different industrial groupings. This also we do by means of multiple regression analyisis. What we propose here is to calculate (i) marginal propensities to import with respect to the total industrial production, (ii) marginal propensities to consume with respect to real income per capita, (iii) import elasticities with respect to industrial production and (iv) income elasticities of industrial production. We also incorporate the capacity to import as a proxy varible for policy changes.

This analysis makes use of the time-serial data for 1960-74 on the indices of real GNP per capita, the quantum indices of imports up to the two-digit level based on the Monthly Statistics of Foreign Trade, the volume indices of production up to the two-digit level based on the data from the ASI, the volume indices of the total industrial production and the capacity to import. The capacity to import is defined as the sum of gross export earnings (in post-devaluation rupees), net aid inflows and changes in foreign exchange reserves. This sum was deflated by the unit value index of imports of the relevant year to get a real value series of the capacity to import. With the help of this data, we tackled two multiple regression models. In one case, we specified the import index of each category as a function of the index of that year's industrial production and the capacity to import with one-years's lag. In the other case, we specified the quantum index of industrial production of each category as a function of the index of the real GNP per capita of the same year and the capacity to import with

one year's lag. We chose the first specification because we believed that the total industrial production and the capacity to import ought to exercise the pull on imports rather than the conventional variables like relative prices[1] and real per capita income. Our interest was mainly to discover how the principal import categories behave in the face of the changing volume of the total industrial production and the capacity to import. The capacity to import could be looked upon as the policy variable subsuming the impact of the shifts in the import control policy. We thought that a change in the capacity to import was bound to affect import controls in an opposite direction. The justification behind our second specification is based on the belief that the industrywise industrial output ought to depend upon the real GNP per capita and the policy variable, the capacity to import. On the face of it, it may seem that the capacity to import acts simply as an overall constraint and may fail to influence the levels of category-wise imports. But we do not think so. A change in the capacity to import would affect not only total imports but also the individual categories of imports through the differential impact of liberalisation (or tightening) of import controls. It is well known that an increase in the capacity to import leads to a liberalisation of imports of particular categories to a greater extent than others. A decrease in the capacity to import would have the opposite effect. It is for this reason that we chose the capacity to import as one of the explanatory variables. In other words, this variable, through its impact on categorywise imports, does take account of the differential long-run impact of policy changes that occur from time to time. In this way one can verify the role that trade policy plays in the determination of the patterns of industrial output and imports. There is no other way of incorporating the autonomous influence of trade policy, if any, on the pattern of industrial output.

For both the specifications we attempted linear and log-linear fits. By and large both the fits are good and R^2 furnished by each method are not vastly different. As regards the signs of regression coefficients we expect the capacity to import should exercise a favourable (i.e. positive) influence both in imports and industrial production expect further that the real GNP per capita should exercise a differential pull on different industries; in most cases this influence is bound to be positive; however, the influence of total industrial production on imports will be either positive or negative depending on whether the underlying relationship is direct or inverse. The negative relationship can show the strength of import substitution but the positive relationship might indicate the strategic importance of the import items in question.

Comments on the Results Obtained

Our results on production and import coefficients in a linear case and production and import elasticities in a non-linear case are presented in Tables 7.1, 7.3, 7.5 and 7.7. The details of regression results are presented in Table 7.2, 7.4, 7.5 and 7.8. We have the following comments to make on the basis of the above tables.

(i) R^2 for sector-wise industrial production on one hand and the real GNP per capita and the capacity to import on the other are quite high in the range of

0.70 to 0.96 and F-test for R^2 is significant at 1% and 5% level of significance in all cases except foot-wear, wood and cork and miscellaneous manufacturing industry both in the linear and log-linear cases.

(ii) The production coefficients (the linear case) are positive with respect to real GNP per capita in 16 out of 18 cases; these coefficients are positive in all cases with respect to the capacity to imports. The signs of the coefficients are mostly correct.

(iii) The production elasticities (the log-linear case) with respect to real GNP per capita are greater than unity for 13 out of 18 cases but these elasticities with respect to the capacity to import are less than unity. This may be due to the forces of import substitution and import control where the former is successful; the latter must have led to a fall in imports despite an improvement in the capacity to import.

The t-test on b-coefficients turned out to be significant in all but one case at 5% level of significance and in 15 out of 18 cases at 1% level of significance.

(iv) In the sphere of industrial production, the real GNP per capita appears to be a far more important variable than the capacity to import. Thus, the internal variable has a dominating influence compared to the external variable.

(v) In our regression exercise, the D-W statistic test did not furnish good results and there was evidence that serial correlation was present in all the cases. But this, as is well known, does not affect unbiasedness of our regression coefficients.

(vi) The sectorwise imports on one hand and total industrial production coupled with the capacity to import on the other yield R^2 which are good in many cases, though not as high as in the earlier case. In the linear case, Crude Fertilisers and Crude Materials, Chemical Elements and Chemical Compounds, Dyeing, Tanning and Colouring Materials, Explosives and Pyrotechnic products, Wood and Cork Manufactures, Made-up Textiles Yarn Fabrics, Electrical Machinery and Non-Electrical Machinery furnished R^2s which fell in the range of 0.83,to 0.61. In the Log-linear case these same product groups along with Manufactured Fertilisers, Plastic Materials and Resins and Transport Equipment furnished R^2s in the range of 0.89 to 0.59. Besides, in the linear case we come across 14 products whose R^2s were in the range of 0.57 to 0.43 and in the log-linear case, there were seven such products having R^2s between 0.58 and 0.55. In all the cases mentioned here F-test on R^2 turned out to be significant both at 5% and 1% level of significance.

Observations in the previous paragraph indicate how the total industrial production exercises a strong pull on those imports of Crude Materials which have escaped treatment in our earlier chapters.

(vii) In the linear case, we found 15 out of 28 products having positive import coefficients with respect to the total industrial production. The remaining products had negative coefficients. In the non-linear case, this resulted in 11 out of 15 products having positive import elasticities and greater than unity ranging between 1.11 to 4.78. This speaks of the strong import dependence. Only in Iron and Steel, Paper and Paper Products, Plastic Materials and Resins Miscellaneous Manufactured Articles were the import elasticities less than one

where the import dependence is comparatively weaker. For those products where the import coefficients were negative, the import elasticities were absolutely greater than unity in 8 out of 13 products. This explains the strength of import substitution in the case of these products and the list contains traditional light manufacture. But in the case of Crude Materials and Minerals, Explosives and Pyrotechnic products, Rubber Manufactures, Non-Ferrous Metals and Non-Electrical Machinery these negative import elasticities are absolutely less than unity showing the weak negative inter-dependence between production and imports.

(viii) T-values calculated for b-coefficients in our regressions turned out to be greater than the relevant table values. In most of the cases thus showing that the standard errors of b's were within the permissile limits. In 19 out of 28 cases of linear and non-linear regressions t-test on b-coefficients was satisfactory at 5% level of significance, while it was satisfactory in 13 out of 28 cases at 1% level of significance.

(ix) The capacity to import turned out to be an irrelevant variable because it gave wrong signs in all but nine cases. Among the latter cases, the elasticities were greater than one only in three cases.

(x) It must be emphasised once again that the data base of this exercise is different from that of the earlier chapters. Here our category-wise imports belong to 2-digit level classification of imports* and these are brought into interact with the total industrial production. This enables us to examine the behaviour of those imports which were left out in our earlier exercises based on the correspondence of industrial imports and industrial production. For instance, Crude Materials Inedible (except fuels) and Mineral fuels and Related Materials figure in our present exercise. Aa a result of this broadening the scope of imports, we have been able to find out which imports decline in relative importance with the growth in industrial production and which imports increase in relative importance with the growth in industrial production as shown in the para (vi) and (vii) above. To this extent, our earlier results on import-dependence get improved in this chapter.

* Imports as classified according to the Revised Indian Trade Classification.

References

1. Most studies on the estimation of import-demand functions for the Indian economy use the unit-value index for imports as a proxy for the price of imports. Now, the unit-values are derived from the c.i.f. import values. As soon as an import lands on Indian soil it is subject to a variety of duties that brings the price of the imported goods into equality with the price of the domestic substitute. Thus the tariff-inclusive price, which is the price that the consumer has to pay, is no different from the price of the domestic substitute—the concept of relative prices is thus meaningless. Imports are, therefore, purchased either because domestic production is not able to satisfy demand or because of other non-price factors such as qualitative differences, real or fancied, between the imported commodities and their domestic substitutes.

Table 7.1 : MARGINAL PROPENSITIES TO IMPORT WITH RESPECT TO TOTAL INDUSTRIAL PRODUCTION

Positive coefficients	
Beverages	(1.5884)
Crude Fertilizers	(1.2434)
Metalliferrous Ores and Metal Scrap	(6.2599)
Animal and Vegetable Oils and Fats	(3.1095)
Chemical Elements and Compounds	(1.1215)
Mineral Tar and Crude Chemicals from Coal, Petroleum and Natural Gas	(13.0151)
Medicinal and Pharmaceutical Products	(2.2947)
Fertilizers Manufactured	(12.5657)
Non-metallic Mineral Manufactures	(2.3873)
Electrical Machinery, Apparatus and Appliances	(2.2387)
Petroleum and Petroleum Products	(0.3519)
Plastic Materials, Regenarated Cellulose of Artificial Resins	(0.5520)
Paper, Paper Board and Manufactures thereof	(0.2035)
Iron and Steel	(0.4246)
Miscellaneous Manufactured Articles	(0.9041)
Negative coefficients	
Tobbacco	(- 3.4874)
Explosives and Pyrotechnic Products	(- 1.6856)
Crude Materials	(- 0.2178)
Pulp and Waste Paper	(- 0.7482)
Textile Fibres and Their Waste	(- 0.4874)
Dyeing, Tanning and Colouring Materials	(- 0.8019)
Leather, Leather Manufactures n.e.c. and Dressed Fur Skins	(- 0.5165)
Rubber Manufactures n.e.s.	(-0.2879)
Wood and Cork Manufactures	(- 0.9675)
Textile Yarn, Fabrics, Made-up Articles and Related Products	(- 0.5914)
Non-Ferrous Metals	(- 0.5211)
Non-electrical Machinery	(- 0.5023)
Transport Equipment	(- 0.5591)
Goods classified according to economic classification	
Consumer Goods	(0.5839)
Intermediate Goods	(0.3136)
Machinery	(0.0012)

Table 7.2 : 1) MARGINAL PROPENSITIES TO IMPORT

i) Without Logs

Equation	*Dependent Variable (V)*	*a*	*b*	*c*	R^2	*F-Test*
T2LN	01 Beverages	97.4390 (0.4018)n.s.	1.5884 (1.7731)n.s.	- 0.1452 (- 1.4082)n.s.	0.4313	4.5510*
	02 Tobacco and Tobacco manufactures	807.8524 (2.7339)**	- 3.4874 (-3.1950)**	- 0.0802 (- 0.6386)n.s.	0.4770	5.4733*
	03 Crude materials, inedible except fuels	158.6057 (3.2912)**	- 0.2178 (-1.2235)n.s.	- 0.0258 (- 1.2591)n.s.	0.1513	1.0697n.s.
	04 Pulp and waste Paper	200.1807 (3.5504)**	-0.7482 (-3.5925)**	0.0023 (0.0943)n.s.	0.5776	8.2040**
	05 Textile Fibres and their waste	156.5511 (4.0238)**	-0.4874 (-3.3914)**	- 0.0073 (- 0.4411)n.s.	0.5178	6.4420*
	06 Crude Fertilizers and Crude Minerals	9.1639 (0.1680)n.s.	1.2434 (6.1711)**	- 0.0225 (-0.9685)n.s.	0.8209	27.5002**
	07 Metalliferrous Ores and Metal Scrap	414.9409 (0.4777)n.s.	6.2599 (1.9510)*	- 0.6206 (-1.6801)n.s.	0.4963	5.9113*
	08 Petroleum and Petroleum products	144.0832 (1.6318)n.s.	0.3519 (1.0788)n.s.	- 0.0394 (- 1.0498)n.s.	0.2525	2.0273n.s.
	09 Animal and Vegetable Oils and Fats	- 74.7708 (- 0.2291)n.s.	3.1095 (2.5794)*	- 0.0920 (- 0.6626)n.s.	0 4709	5.3397*
	10 Chemical Elements and Compounds	25.8478 (0.5205)n.s.	1.1215 (6.1138)**	- 0.0369 (- 1.7455)n.s.	0.8376	30.9446**
	11 Mineral Tar and Crude Chemicals from Coal Petroleum and Natural Gas	- 1342.8965 (- 1.2638)n.s.	13.0151 (3.2914)**	- 0.1599 (- 0.3512)n.s.	0.5534	7.4358**
	12 Dyeing, Tanning and Colouring Materials	190.7486 (6.2900)**	- 0.8019 (- 7.1589)**	- 0.0092 (- 0.7145)n.s.	0.8302	29.3336**

contd.

Table 7.2 : (Continued)

Equation	*Dependent Variable (V)*	*a*	*b*	*c*	R^2	*F-Test*
T2LN	13 Medicinal and Pharmaceutical Products	- 33.5831 (- 0.0946)n.s.	2.2947 (1.7499)n.s.	- 0.0821 (- 0.5438)n.s.	0.3028	2.6059n.s.
	14 Fertilizers manufactured	- 694.5247 (- 0.6192)n.s.	12.5657 (3.0327)**	- 0.2879 (-0.6037)n.s.	0.5363	6.9395**
	15 Explosives and Pyrotechnic Products	271.9329 (2.0346)*	- 1.6856 (- 3.4144)**	0.0519 (0.9127)n.s.	0.6120	9.4623**
	16 Plastic materials, regenerated Cellulose and artificial Resins	244.3244 (2.0192)*	0.5520 (1.2351)n.s.	- 0.1232 (- 2.3939)*	0.5051	6.1248*
	17 Leather, leather manufactures n.e.s. and dressed Fur Skins	126.4697 (1.7824)*	- 0.5165 (- 1.9706)*	- 0.0063 (- 0.2101)n.s.	0.2693	2.2114n.s.
	18 Rubber manufactures n.e.s.	178.2625 (2.7368)**	- 0.2879 (- 1.1965)n.s.	- 0.0497 (- 1.7950)*	0.2221	1.7127n.s.
	19 Wood and Cork manufactures	40.7135 (0.3519)n.s.	- 0.9675 (- 2.2636)*	0.1329 (2.6999)**	0.6482	11.0554**
	20 Paper, Paper Board and manufactures thereof	104.7592 (2.4718)*	0.2035 (1.3000)n.s.	- 0.0128 (- 0.7078)n.s.	0.2371	1.8642n.s.
	21 Textile yarn, Fabrics, made up Articles and related Products	124.7375 (3.0202)**	- 0.5914 (- 3.8763)**	0.0272 (1.5476)n.s.	0.7015	14.1026**
	22 Non-metallic Mineral manufactures n.e.s.	232.4548 (0.6729)n.s.	2.3873 (1.8708)*	- 0.2447 (- 1.6655)n.s.	0.4828	5.6019*
	23 Iron and Steel	1.9447 (0.0236)n.s.	0.4246 (1.3975)n.s.	0.0134 (0.3830)n.s.	0.1441	1.0104n.s.
	24 Non-ferrous Metals	148.3263 (2.6638)*	- 0.5211 (- 2.5337)n.s.	0.0135 (0.5695)n.s.	0.4534	4.9775*
	25 Machinery, other than electric	71.3589 (1.7828)*	- 0.5023 (-3.3973)**	0.0772 (4.5363)**	0.8255	28.3847**

Contd.

Table 7.2 (Continued)

Equation	Dependent Variable (V)	a	b	c	R^2	*F-Test*
T2LN	26 Electrical Machinery, apparatus and appliances	- 195.1895 (- 0.9456)n.s.	2.2387 (2.9360)**	0.0181 (0.2064)n.s.	0.4568	5.0463*
	27 Transport Equipment	118.3358 (3.6261)**	- 0.5591 (- 4.6383)**	0.0200 (1.4382)n.s.	0.7530	18.2957**
	28 Miscellaneous Manufactured Articles	- 133.7229 (- 0.9725)n.s.	0.9041 (1.8167)*	0.1304 (2.2764)*	0.3334	3.0007n.s.
	29 Consumer Goods	- 104.7409 (- 0.9226)n.s.	0.5839 (1.3923)n.s.	0.1042 (2.1587)*	0.2899	2.4501n.s.
	30 Intermediate Goods	97.2272 (3.0993)**	0.3136 (2.7059)**	- 0.0202 (- 1.5114)n.s.	0.5776	8.2046**
	31 Machinery	28.0090 (0.6319)n.s.	0.0012 (0.0071)n.s.	0.0541 (2.8684)**	0.4593	5.0971*

$V = a + bX_1 + cX_2$ where X_1 : Total Industrial Production (Indices)
X_2 : Capacity to Import
(Figures in the brackets indicate T-Test)

$t_{12;.05} = 1.782$ $F_{2,12;.05} = 3.88$ 5% level of significance
$t_{12;.01} = 2.681$ $F_{2,12;.01} = 6.93$ 1% level of significance

* Significant at 5%
** Significant at both 5% and 1% levels of significance
n.s. Not significant

Table 7.3 : IMPORT ELASTICITIES (LOG-LINEAR CASE) WITH RESPECT TO TOTAL INDUSTRIAL PRODUCTION

Positive coefficients	
(i) Greater than unity	
Beverages	(1.2162)
Crude Fertilizers and Crude Minerals	(1.1143)
Metalliferrous Ores and Metal Scrap	(2.4825)
Petroleum and Petroleum Products	(3.0295)
Animal and Vegetable Oils and Fats	(1.8322)
Chemical Elements and Compounds	(1.1106)
Mineral Tar and Crude Chemicals from Coal, Petroleum and Natural Gas	(4.7822)
Medicinal and Pharmaceutical Products	(1.0122)
Fertilizers Manufactured	(3.7783)
Non-metallic Mineral Manufactures, n.e.s.	(1.2914)
Electrical Machinery	(1.5703)
(ii) Less than unity	
Plastic Materials, Regenerated Cellulose and Artificial Resins	(0.5392)
Paper, Paper Board and Manufactures thereof	(0.2236)
Iron and Steel	(0.4131)
Miscellaneous Manufactured Articles	(0.8397)
Negative coefficients	
(i) With absolute values greater than unity	
Tobacco and Tobacco Manufactures	(- 3.4794)
Pulp and Waste Paper	(- 1.2971)
Textile Fibres and their Waste	(- 1.2110)
Dyeing Tanning and Colouring Materials	(- 2.1200)
Explosives and Pyrotechnic Products	(-3.3029)
Leather, Leather Manufactures, n.e.s. and Dressed Fur Skins	(- 1.8746)
Wood and Cork Manufactures	(- 2.7218)
Textile Yarn, Fabrics, Made-up Articles and Related Products	(- 1.2962)
Transport Equipment	(- 1.4205)
(ii) With absolute values less than unity	
Crude Materials, Inedible except Fuels	(- 0.4572)
Rubber Manufactures n.e.s.	(- 0.7982)
Non-Ferrous Metals	(- 0.8251)
Non-electrical Machinery	(- 0.9472)
Import elasticities (log-linear case) with respect to total industrial production	
(Goods classified according to economic classification)	
Consumer Goods	(0.7223)
Intermediate Goods	(0.3679)
Machinery	(- 0.1839)

Table 7.4 : 1) IMPORT ELASTICITIES (NON—LINEAR CASE)

ii) With Logs

Equation	*Dependent Variable (V)*	*a*	*b*	*c*	R^2	*F-Test*
T2LN	01 Beverages	4.4076 (1.5027)n.s.	1.2162 (2.0228)*	- 1.5964 (-2.3784)*	0.5920	8.7050**
	02 Tobacco and Tobacco manufactures	7.8435 (1.4772)n.s.	- 3.4794 (- 3.1965)**	0.5420 (0.4461)n.s.	0.5475	7.2591**
	03 Crude materials, inedible except fuels	4.2343 (2.4627)*	- 0.4572 (- 1.2970)n.s.	- 0.4148 (- 1.0542)n.s.	0.1410	0.9846n.s.
	04 Pulp and waste Paper	4.4171 (2.5818)*	- 1.2971 (- 3.6984)n.s.	0.1029 (0.2628)n.s.	0.6021	9.0798**
	05 Textile Fibres and their waste	4.8626 (2.2267)*	- 1.2110 (- 2.7051)**	- 0.1268 (- 0.2538)n.s.	0.4124	4.2113*
	06 Crude Fertilizers and Crude Minerals	0.3502 (0.4000)n.s.	1.1143 (6.2089)**	- 0.1802 (- 0.8996)n.s.	0.8211	27.5373**
	07 Metalliferrous Ores and Metal Scrap	3.1676 (0.6388)n.s.	2.4825 (2.4419)*	- 1.9367 (- 1.7066)n.s.	0.5655	7.8087**
	08 Petroleum and Petroleum products	2.8070 (1.7492)n.s.	3.0295 (0.9209)n.s.	- 0.4222 (- 1.1497)n.s.	0.2435	1.9309n.s.
	09 Animal and Vegetable Oils and Fats	0.1432 (0.0505)n.s.	1.8322 (3.1503)**	- 0.5643 (-0.8692)n.s.	0.5758	8.1441**
	10 Chemical Elements and Compounds	0.9960 (1.1412)n.s.	1.1106 (6.2077)**	- 0.4039 (- 2.0225)*	0.8477	33.4004**
	11 Mineral Tar and Crude Chemicals from Coal Petroleum and Natural Gas	- 1.6409 (- 1.9762)*	4.7822 (2.8094)**	- 2.1080 (- 1.1094)n.s.	0.5517	7.3851**
	12 Dyeing, Tanning and Colouring Materials	6.1982 (4.8003)**	- 2.1200 (- 8.0092)**	0.0310 (0.1050)n.s.	0.8705	40.3440**

contd.

Table 7.4 : (Continued)

Equation	*Dependent Variable (V)*	*a*	*b*	*c*	R^2	*F-Test*
T2LN	13 Medicinal and Pharmaceutical Products	2.1603 (0.7130)n.s.	1.0122 (1.6297)n.s.	- 0.6745 (- 0.9728)n.s.	0.3414	3.1109n.s.
	14 Fertilizers manufactured	- 5.8942 (- 1.7573)n.s.	3.7783 (5.4950)**	0.1366 (0.1779)n.s.	0.7526	18.2515**
	15 Explosives and Pyrotechnic Products	2.0928 (0.7201)n.s.	- 3.3029 (- 5.5439)**	2.1674 (3.2591)**	0.8559	35.6429**
	16 Plastic Materials, regenerated cellulose and artificial resins	4.5057 (2.7710)**	0.5392 (1.6174)n.s.	- 1.1201 (- 3.0104)**	0.6235	7.9371**
	17 Leather, Leather manufactures n.e.s. and dressed Fur Skins	6.2899 (1.7998)*	- 1.8746 (- 2.6166)*	- 0.2335 (- 2.9199)**	0.3933	3.8889*
	18 Rubber manufactures n.e.s.	7.8644 (2.6999)**	- 0.7982 (- 1.3368)n.s.	- 1.3903 (- 2.0859)*	0.2755	2.2820n.s.
	19 Wood and Cork manufactures	- 3.1695 (- 1.1863)n.s.	- 2.7218 (- 4.9693)**	3.4263 (5.6040)**	0.8932	50.1844**
	20 Paper, Paper Board and manufactures thereof	2.1062 (2.2585)*	0.2236 (1.1696)n.s.	- 0.1672 (- 0.7835)n.s.	0.2244	1.7357n.s.
	21 Textile yarn, Fabrics, made up Articles and related Products	2.8088 (1.6347)n.s.	- 1.2962 (- 3.6798)**	0.5841 (1.4855)n.s.	0.6808	12.7949**
	22 Non-metallic Mineral manufactures n.e.s.	3.3496 (0.9234)n.s.	1.2914 (1.7367)n.s.	- 1.2251 (- 1.4759)n.s.	0.4360	4.6382*
	23 Iron and Steel	0.1495 (0.0529)n.s.	0.4131 (0.7132)n.s.	0.2731 (0.4223)n.s.	0.0418	0.2614n.s.
	24 Non-ferrous Metals	2.5684 (1.6705)n.s.	- 0.8251 (- 2.6179)*	0.3653 (1.0382)n.s.	0.5171	6.4244*
	25 Machinery, other than electric	0.7267 (0.4080)n.s.	- 0.9472 (- 2.5940)*	1.0556 (2.5899)*	0.6675	12.0465**

contd.

Table 7.4 : (Continued)

Equation		*Dependent Variable (V)*	*a*	*b*	*c*	R^2	*F-Test*
T2LN	26	Electrical Machinery, apparatus and appliances	- 1.9070 (- 0.9925)n.s.	1.5703 (3.9866)**	0.2194 (0.4990)n.s.	0.5984	8.9401**
	27	Transport Equipment	2.8937 (1.8338)*	- 1.4205 (- 4.3912)**	0.6181 (1.7116)n.s.	0.7494	17.9402**
	28	Miscellaneous Manufactured Articles	- 2.3981 (- 1.1333)n.s.	0.8397 (1.9359)*	0.8980 (1.8546)*	0.2936	2.4934n.s.
	29	Consumer Goods	- 3.0726 (- 1.3981)n.s.	0.7223 (1.6033)n.s.	1.1433 (2.2733)*	0.3187	2.8061n.s.
	30	Intermediate Goods	2.0753 (3.0404)**	0.3679 (2.6293)*	- 2.5865 (- 1.6559)n.s.	0.5832	8.3960**
	31	Machinery	- 0.1721 (- 0.1494)n.s.	- 0.0434 (- 0.1839)n.s.	0.7246 (2.7493)**	0.4544	4.9974*

$V = a + b \log X_1 + c \log X_2$

where X_1 : Total Industrial Production (Indices)
X_2 : Capacity to Import
(Figures in the brackets indicate T-Test)

$t_{12;\ .05} = 1.782$
$t_{12;\ .01} = 2.681$

$F_{2,\ 12;\ .05} = 3.88$ 5% level of significance
$F_{2,\ 12;\ .01} = 6.93$ 1% level of significance

* Significant at 5% level of significance
** Significant at 1% level of significance
n.s. Not significant

Table 7.5 : PRODUCTION COEFFICIENTS (LINEAR CASE) WITH RESPECT TO REAL GNP PER CAPITA

Positive coefficients	
Food	(1.1955)
Beverages and Tobacco	(1.8671)
Wood and Cork except Furniture	(2.1901)
Paper and Paper Products	(2.9209)
Rubber Products	(3.1803)
Chemicals and Chemical Products	(3.8972)
Petroleum Refinery Products	(4.7389)
Non-metallic Mineral Products	(2.6151)
Basic Metal Industries	(2.2371)
Metal Products except Machinery and Transport Equipment	(3.3199)
Non-electrical Machinery	(6.8299)
Electrical Machinery, Apparatus, Appliances and Supplies	(6.8651)
Electricity	(5.9822)
Textiles	(0.2578)
Foot-wear	(0.9485)
Transport Equipment	(0.9772)
Negative coefficients	
Leather and Fur Products except Foot-wear	(- 0.6676)
Miscellaneous Manufacturing Industry	(- 0.0272)

Table 7.6 : 2) PRODUCTION COEFFICIENTS (LINEAR CASE)

i) Without Logs

Equation	*Dependent Variable (V)*	*a*		*c*	R^2	*F-Test*
T3LN	01 Manufacture of food	- 29.8983 (- 0.7707)n.s.		0.0062 0.4947)n.s.	0.8038	24.5886**
	02 Manufacture of beverages and tobacco	- 111.0822 (- 2.5067)*	86 (8.02..	1 0185 .1.2949)n.s.	0.8755	42.1897**
	03 Manufacture of textiles	58.6507 (6.2965)**	0.2578 (5.2703)**	9.0142 (4.4132)**	0.7152	15.0701**
	04 Manufacture of foot-wear and other wearing apparel and made up textile goods	- 10.2502 (0.1114)n.s.	0.9485 (1.9623)*	0.0331 (1.1175)n.s.	0.2433	19.2919**
	05 Manufacture of wood cork except furniture	- 158.8847 (- 0.9238)n.s.	2.1901 (2.4251)*	0.043? (0.79)	0.3550	3.3023n.s.
	06 Manufacture of paper and paper products	- 206.4802 (- 6.8943)**	2.9209 (18.5724)**	0.008 (0.8608)n.s.	0.9772	257.4093**
	07 Manufacture of leather and fur products ex. foot-wear and other wearing apparel	120.3420 (2.6641)*	- 0.6676 (- 2.8145)**	0.0432 (2.9728)**	0.7795	21.2066**
	08 Manufacture of rubber products	- 231.8507 (- 5.5367)**	3.1803 (14.4625)**	0.0104 (0.7695)n.s.	0.9627	154.8345**
	09 Manufacture of chemicals and chemical products	- 313.0679 (- 4.8526)**	3.8972 (11.5034)**	0.0110 (0.5305)n.s.	0.9427	98.7785**
	10 Petroleum refinery products	- 344.7539 (- 5.4224)**	4.7389 (14.1939)**	- 0.0223 (- 1.0893)n.s.	0.9668	174.6234**
	11 Manufacture of non-metallic mineral products ex. products of petroleum and coal	- 198.3774 (- 5.2154)**	2.6151 (13.0925)**	0.0233 (1.9073)*	0.9501	114.2442**
	12 Basic metal industries	- 159.3970 (- 3.1148)**	2.2371 (8.3247)**	0.0425 (2.5813)*	0.8679	39.4084**

contd.

Table 7.6 : (Continued)

Equation	*Dependent Variable (V)*	*a*	*b*	*c*	R^2	*F-Test*
T3LN	13 Manufacture of metal products ex. machinery and transport equipment	- 315.0898 (- 4.1742)**	3.3199 (8.3753)**	0.0604 (2.4852)*	0.8705	40.3342**
	14 Manufacture of machinery except electrical	- 647.0267 (- 6.5896)**	6.8299 (13.2464)**	0.0528 (1.6727)n.s.	0.9522	119.4653**
	15 Manufacture of electrical machinery apparatus etc.	- 610.4636 (- 6.5152)**	6.8651 (13.9527)**	0.0083 (0.2760)n.s.	0.9615	149.9477**
	16 Manufacture of transport equipment	- 124.9067 (- 2.9594)**	0.9772 (4.4090)**	0.1067 (7.8584)**	0.8377	30.9721**
	17 Miscellaneous manufacturing Industry	74.9630 (1.2087)n.s.	- 0.0272 (- 0.0836)n.s.	0.0292 (1.4611)n.s.	0.2314	1.8060n.s.
	18 Electricity generated	- 510.4595 (-7.4549)**	5.9822 (16.6372)**	0.0041 (0.1861)n.s.	0.9729	215.4104**

$V = a + bX_1 + cX_2$ where X_1 : Index of Real GNP per Capita
X_2 : Capacity to Import
(Figures in the brackets indicate T-Test)

$t_{12}.05 = 1.782$ $F_{2,12}.05 = 3.88$ 5% level of significance

$t_{12}.01 = 2.681$ $F_{2,12}.01 = 6.93$ 1% level of significance

* Significant at 5% level of significance

** Significant at both 5% and 1% levels of significance

n.s. Not significant

Table 7.7 : PRODUCTION ELASTICITIES (LOG-LINEAR CASE) WITH RESPECT TO REAL GNP PER CAPITA

Positive coefficients	
(i) Greater than unity	
Food	(1.1196)
Beverages and Tobacco	(1.6464)
Wood and Cork	(1.9128)
Paper and Paper Products	(2.2644)
Rubber Products	(2.3330)
Chemicals and Chemical Products	(2.6413)
Petroleum Refinery Products	(3.0558)
Non-metallic Mineral Products	(2.0807)
Basic Metal Industries	(1.8194)
Metal Products except Machinery and Transport Equipment	(2.4758)
Non-electrical Machinery	(3.6718)
Electrical Machinery, Apparatus, Appliances and Supplies	(3.7363)
Electricity generated	(3.4137)
(ii) Less than unity	
Textiles	(0.3109)
Foot-wear	(0.9985)
Transport Equipment	(0.9523)
Negative coefficients	
(i) With absolute values greater than unity	
No group falls within this category	
(ii) With absolute values less than unity	
Leather and Fur Products except Foot-wear	(- 0.8654)
Miscellaneous Manufacturing Industry	(- 0.0798)

Table 7.8 : 2) PRODUCTION ELASTICITIES (LOG LINEAR CASE)

ii) With Logs

Equation	*Dependent Variable (V)*	*a*	*b*	*c*	R^2	*F-Test*
T3LN	01 Manufacture of food	- 0.4196 (- 0.5201)n.s.	1.1196 (5.4092)**	0.0569 (0.3864)n.s.	0.7854	21.9529**
	02 Manufacture of beverages and Tobacco	- 1.9181 (- 2.3423)*	1.6464 (7.8361)**	0.2017 (1.3507)n.s.	0.8723	40.9698**
	03 Manufacture of textiles	0.8362 (3.7738)**	0.3109 (5.4690)**	0.1758 (5.3509)**	0.7232	15.6747**
	04 Manufacture of foot-wear and other wearing apparel and made up textile goods	- 1.1483 (- 07531)n.s.	0.9985 (2.5522)*	0.3954 (1.4217)n.s.	0.3535	3.2809n.s.
	05 Manufacture of wood cork except furniture	- 3.0520 (- 1.1968)n.s.	1.9128 (2.9235)**	0.4051 (0.8709)n.s.	0.4555	5.0188*
	06 Manufacture of paper and paper products	- 2.9457 (- 5.4830)**	2.2644 (16.4278)**	0.1334 (1.3617)n.s.	0.9708	199.7082**
	07 Manufacture of leather and fur products ex. foot-wear and other wearing apparel	1.4440 (1.0306)n.s.	- 0.8654 (- 2.4076)*	0.7461 (2.9195)**	0.7592	189.1769**
	08 Manufacture of rubber products	- 3.1393 (- 5.1754)**	2.3330 (14.9907)**	0.1569 (1.4181)n.s.	0.9647	163.9863**
	09 Manufacture of chemicals and chemical products	- 3.7237 (- 5.4367)**	2.6413 (15.0304)**	0.1424 (1.1400)n.s.	0.9656	168.5961**
	10 Petroleum refinery products	- 4.0251 (- 3.8317)**	3.0558 (11.3384)**	- 0.0236 (- 0.1332)n.s.	0.9468	106.7494**
	11 Manufacture of non-metallic mineral products ex. products of petroleum and coal	- 2.9627 (- 5.7465)**	2.0807 (15.7305)**	0.2551 (2.7130)**	0.9649	165.0843**
	12 Basic metal indsutries	- 3.0053 (- 3.3970)**	1.8194 (8.0158)**	0.4595 (2.8478)**	0.8569	35.9324**

contd.

Table 7.8 : (Continued)

Equation	*Dependent Variable (V)*	*a*	*b*	*c*	R^2	*F-Test*
T3LN	13 Manufacture of metal products ex. machinery and transport equipment	– 4.6445 (– 3.9527)**	2.4758 (8.2124)**	0.5447 (2.5415)*	0.8672	39.1939**
	14 Manufacture of machinery except electrical	– 7.0427 (– 5.6458)**	3.6718 (11.4730)**	0.5623 (2.4712)*	0.9332	83.8326**
	15 Manufacture of electrical machinery apparatus etc.	– 6.2492 (– 6.1603)**	3.7363 (14.3555)**	0.2529 (1.3666)n.s.	0.9616	150.2774**
	16 Manufacture of transport equipment	– 3.0548 (– 3.5542)**	0.9523 (4.3183)**	1.0265 (6.5477)**	0.7817	21.4803**
	17 Miscellaneous manufacturing Industry	1.2218 (0.7902)n.s.	– 0.0798 (– 0.2012)n.s.	0.3156 (1.1190)n.s.	0.1769	1.2892n.s.
	18 Electricity generated	– 5.4170 (– 6.8346)**	3.4137 (16.7875)**	0.1963 (1.3575)n.s.	0.9721	209.0557**

$V = a + \log X_1 + \log X_2$ where X_1 : Index of Real G.N.P. per Capita
X_2 : Capacity to Import
(Figures in the brackets indicate T-Test)

$t_{12}.05 = 1.782$ $F_{2,12}.05 = 3.88$ 5% level of significance
$t_{12}.01 = 2.681$ $F_{2,12}.01 = 6.93$ 1% level of significance

* Significant at 5%
** Significant at both 5% and 1% levels of significance
n.s. Not significant

CHAPTER VIII

SUMMARY AND CONCLUSION

By way of conclusion it is important to indicate what this study does and what it does not show. Since this study is concerned with the relationships which are hitherto unearthed, it is likely to arouse undue expectations. It is unfair to expect results and conclusions in this study which are not data-based. We have scrupulously avoided sweeping generalisations and conjectures which have no firm roots in our data. With this rider in mind let us look at what we have accomplished and what we have not.

As shown at many places the data-frame of this study is the comparable data of industrial imports and industrial production based on the scheme of correspondence bringing the trade and production data under the uniform ASI classification. This is an advantage because industrial imports and production become directly comparable. But it is also a disadvantage because the picture at 2-digit and 3-digit levels does suffer from high degree of aggregation. So, our findings relate to this level of aggregation and not lower than this.

Within this framework we tried to find a number of indicators of the degree of import dependence. At the out set we discovered that industrial imports constituted 74.62 per cent of the total imports in 1960, though the same percentage came down to 50 per cent in 1975. This discovery meant that the manufacturing sector covered by the ASI exercises a strong import pull. Though some portion of these imports might have got diverted to fulfil the final demand, a substantial proportion of them was meant as inputs, direct and indirect, into the manufacturing sector itself. By following the ASI classification we found out the import pulls of the 2-digit and 3-digit level industries. The resulting import-/supply ratios are presented and trends in them over time in detail are studied for some important industries in Chapter V.

We also used the above data framework to carry out a set of exercises which we thought we could hopefully undertake. Our first exercise was on structural change in industrial production and industrial imports of 2 and 3-digit levels of the ASI classification. Our analysis confirmed on the basis of 1960 and 1975 comparison that the patterns of industrial production and industrial imports had undergone a drastic structural change; that a set of traditional industries have suffered a relative decline compared to a set of modern industries; and that

modern industries had a greater pull on imports than traditional ones. At 3-digit level, we got some evidence of a set of new consumer goods industries expanding at more than average growth-rates and this evidence alone enabled us to infer indirectly that income distribution must have tilted in such a way as to offer growing market for such luxury goods. This point could not be pursued further because bigger groups constituting both traditional and non-traditional industries do not reveal their output composition, though a fair share of final goods consumption supported by these industries, like in the case of textiles, is bound to be influenced by the skew income distribution.

Our second exercise in Chapter V was on import substitution during 1960-75 and we found that a set of traditional industries had very low import dependence ratios right from the beginning and offered no scope for import substitution. Thus, import substitution was attempted effectively during the sixties in modern industries which had high import dependence ratios at the beginning of the period. This set of industries was mainly based on machines, metals, fuels and chemicals. Since import substitution in this field was feasible at lower levels of technology and not at higher levels, import dependence got reduced in some cases but at the cost of an increase in it in some others. As shown in Chapter V, we came across many industries whose import/supply ratios were far above average. In some cases they have reached a plateu of the irreducible minimum and in some cases, even the trends are not unidirectional. All this adds up to a good evidence pointing towards the fact that import substitution has reached saturation round 1970. This is buttressed by the experience during 1970-75 when, to sustain existing and growing output levels, more and more imports were needed resulting in what we have called 'the negative import substitution'. In years to come this is likely to continue. Unless needed, imports become available in future, stagnation will continue to persist with us. This is on the assumption that there occurs no complete reversal of pro-industrialisation policies followed up until now.

To catch the influence of trend factors in the timeserial movements in industrial imports and production over the entire period of 1960-75 we calculated in Chapter VI their compound growth rates and compared them with the overall growth rate in industrial production. This comparison yielded import and production elasticities which indicated differential pulls on the various categories of industrial imports and production. This picture neatly fits in with our results on structural change in Chapter IV based on two-point data and with our results on import substitution in Chapter V based on four-point data. The relationships between traditional industries and imports and those of non-traditional industries and imports get confirmed.

In the last Chapter, we use a slightly different data-base. We take two-digit level imports classified in accordance with Revised Indian Trade Classification. This enables us to incorporate a sizeable portion of imports, particularly import of crude materials, used in industry, which gets left out in our scheme of correspondence. These imports are also subjected to tariff and quota restrictions whose intensity we thought varies with the capacity to import properly defined. We examined by means of multiple regression analysis how these import catego-

ries respond to endogeneous changes in the overall industrial production and the capacity to import. We discovered that import elasticities of the categories of imports connected with modern industries are positive and greater than one and traditional import categories have less than unit elasticity parameters. The capacity of import turns out to be an insignificant variable. Likewise, we use the two-digit level ASI production data and regress values on real income per capita and the capacity to import. In this case also we get measures of differential pulls exerted by real income per capita on different industrial groups and it turns out that the capacity to import is not a significant variable.

So we feel that we do succeed in presenting a factual picture of the past 25 years relating to (1) the differential degree of import dependence of different industrial groups, (2) structural change between industrial production and industrial imports, (3) the relative roles played by traditional and non-traditional industrial groupings in production and imports, (4) interdependence of industrial production and imports measured by import substitution, (5) the influence exercised by the total industrial production and real income per capita on different categories of imports and industrial production respectively.

To put these findings in a proper perspective, we would like to reiterate what we have said in Chapters II and IV. We have shown there that the major stimulus behind the changes outlined above was the process of industrialisation accelerated through the autonomous and endogenous growth of the Indian Economy where the public sector played a pivotal role. Trade policies followed as a consequence had a strong anti-trade bias and the same was dictated by the exigencies of domestic circumstances. The main focus of these policies was to insulate the domestic market from foreign competition and to keep the expanding domestic market reserved for the producers in India. The category of the Indian producer included public sector undertakings, public and private limited companies of Indian and Foreign origin and a vast number of small enterprises. The domestic market derived its support through inter-industry demand and a large scale bureaucratisation of government and semi-government activity plus the growth of technocracy. Thus, in this period the structure of imports did undergo drastic changes but they were in response to changes in the structure of industry at home. Trade policies were not designed to play a triggering role. This view is at variance with the view held by many trade theorists; our view derives a strong support from Kuznets and from Chennery and his associates, whose empirical findings tend to highlight a decisive role played by size and resource-base and a negligible role played by trade policies in economies of moderate size. Since our empirical results are in line with these authors, we accept the endogenous nature of growth in India.

Now let us turn to the aspects which the study has not been able to throw light on. Firstly, this study could not go to lower levels of disaggregation that is permitted by the ASI scheme of industrial classification. So the analysis conducted pertains to a fairly high degree of aggregation. Secondly, this study cannot make an assessment of the relative roles of public and private sectors because the data of different industries is clubbed together, though as seen in Chapter III, public sector investment allocation to industry seems to have

determined the future directions of economic cource. Thirdly, this study does not throw any independent evidence on the distribution of incomes. All that it shows is that at the 3-digit level many luxury consumer goods industries seem to have got a strong impetus. From this evidence one can have a safe conjecture on the underlying income-distribution supporting this composition of output. But it must be realised that the whole of luxury consumer output is not revealed here. It may be a tip of the iceberg, and a separate study on the composition of output in the large industrial groupings is called for in order to make full assessment of luxury component of final consumption. The output of traditional and non-traditional industries will equally get affected by the structure of demand. Textile fabrics is a good example in this connection. In some cases like cement the end-uses of products may throw light on the pull exercised by the demand originating in high and middle income groups. It is thus clear that one should not look for such evidence in this study. Lastly, we must make it clear that this study is not cast in the input-output framework. Imports which we consider here are both direct and indirect and no separation is possible. Similarly, production that is turned out is meant both as an input into different industries as also an output to satisfy final demand and once again no separation is possible. We can only say that in modern industries, the nature of output broadly follows capital and intermediate goods.

We hope this study will receive appreciation with these limitations in view.

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