Imports, Exports, and Industrial Performance in India, 1970-88

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and
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Macroeconomic and trade policies must change significantly to shift India's economy to a more export-oriented path — both to overcome foreign exchange shortages and to rely more on external demand for industrial output. High elasticities in the manufacturing sector indicate that the economy would also respond favorably to changes in incentives.
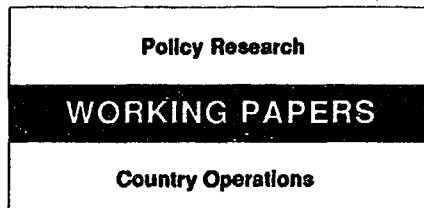
In the 1960s and 1970s, India's policy of encouraging self-sufficiency by restricting imports was complemented by regulation of all facets of the industrial environment. Still, India developed a large, diversified manufacturing sector. In 1977-78, the policy environment began to change — with a relaxing of import controls and restrictions that has continued until now. With reform of industrial policies and a more expansionary macroeconomic policy, the value added in manufacturing grew from 4.5 percent a year in the 1970s to 7.9 percent a year in the 1980s. Meanwhile, gradual depreciation of the currency since 1985 has encouraged exports and brought prices in India closer to world levels.

The faster growth of output and productivity in the 1980s is a welcome change from India's earlier stagnation. But deteriorating macroeconomic balances have brought India to a balance of payments crisis.

Changes in tariffs and other instruments have more than compensated for relaxation of the import regime. Foreign trade has contracted relative to domestic output, despite some relaxation of quantity restrictions and attempts to increase exports. The main reason for this decline has been the increase in import prices relative to domestic output because of increasing tariffs, large real devaluations (especially after 1986), and rapidly expanding domestic demand, which have made the domestic market more attractive than exports.

Policy reform has led to faster growth of manufacturing output and productivity, but the main force behind faster growth has been increased public spending fueled by growing fiscal deficits. Another important variable has been a more accommodating import policy sustained by large external borrowings. This pattern of growth is not sustainable because of significant internal and external debt stocks that have accumulated over the last decade. Macroeconomic and trade policy must change significantly to shift the economy to a more export-oriented path — both to overcome the foreign exchange shortages and to rely more on external demand for industrial output.

Aksoy and Tang argue that the manufacturing sector is highly responsive to relative price changes. Pessimism about elasticity has pervaded Indian policymaking but they show high elasticities, indicating that the economy would respond favorably to changes in incentives.

IMPORTS, EXPORTS AND INDUSTRIAL PERFORMANCE

IN INDIA: 1970-88

BY

M. ATAMAN AKSOY AND HELENA TANG*

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A. INTRODUCTION

1.   Throughout the 1960s and 1970s India's policy of encouraging self-sufficiency by restricting imports, was complemented by regulation of all facets of the industrial environment. Nevertheless, this policy environment did enable India to develop a large diversified manufacturing sector, with a share of GDP rising from 13.9% in 1960/61 to 21.62% in 1987/88. Real manufacturing value added has grown at 4.8% p.a. since 1960/61, while the registered manufacturing has grown faster at 5.2% p.a., compared to GDP growth of only 3.7% p.a.

2.   Beginning in 1977/78 the policy environment started to change. Import controls began to be relaxed and the process of easing restrictions on selected imports has continued until the present. Reforms also began in industrial policies. Accompanied by a more expansionary macroeconomic policy, these reforms have led to an acceleration of the growth of value added in manufacturing from 4.5% p.a. during the 1970s to 7.9% p.a. during the 1980s. The registered manufacturing sector has done even better, its annual growth rate increasing from 4.4% during the 1970s to 9.6% during the 1980s. The ICOR for the manufacturing sector has declined indicating increasing factor productivity in the 1980s. Moreover, gradual depreciation of the currency since 1985 has encouraged increasing exports and brought the prices in India closer to world levels.

3.   The faster growth of output and productivity in the 1980s is a welcome change from the stagnation of the earlier period. In 1988 the output level was double of that in 1981. On the other hand, deteriorating macroeconomic balances have brought the country to a major balance of payments crisis. Faster industrial growth during 1980s was, however, accompanied by large fiscal and current account deficits that have led to unsustainable internal and external debt burdens. Furthermore, it is not clear that significant reforms have been implemented in the trade regime. Tariff collection rates have doubled to more than 60% during the 1980s, which are among the highest in the world. For example, the share of both imports and exports in domestic

output were lower in 1988 than they were in 1979. These observations are contrary to the belief that import intensity of production has increased as a result of the liberalization attempts. Thus, the experience of the 1980s has to be analyzed carefully to place the developments in an appropriate context so that the discussions for future policies can be based on better information.

4.   The Indian trade regime has been comprehensively analyzed by Bhagwati and Srinivasan (1975), Ponchamukhi (1978), Rao (1985) and more recently by Pursell (1988). More specific work on imports and exports, with the exception of the study by Wolf (1982) have focused on the response of exports to relative price changes. These include Reidel, Hall and Grawe (1984), Lucas (1988, 1989), Ram and Rath (1989) and Virmani (1990). Of these, Lucas (1988) developed a general equilibrium model where disaggregated import, export and output behavior is estimated basically with data from the 1970s. More recently Virmani (1990) estimated more aggregative import and export equations. The results of all these studies, despite different time periods and estimation methods, clearly indicate that both exports and imports are highly responsive to relative prices.

5.   The work on industrial output has focused more on the relative stagnation of output and productivity in the 1970s and its acceleration in the 1980s (Ahluwalia (1985, 1991), Goldar and Renghanathan (1990), Kelkar and Kumar (1990) and Nagaraj (1989)). The turnaround has been attributed to policy changes, expansionary macroeconomic policies and improvements in infrastructure. Again, although each study emphasizes different aspects of the structural change in the 1980s, almost all of them agree that the pace of industrial growth has accelerated.

6.   These two strands of analysis indicate that the policy environment has changed in the 1980s, but have not systematically analyzed the components of these changes and their interaction with the key variables. The purpose of this study is to integrate policy developments with the behavior of trade and output behavior. It tries to evaluate the experience of the last two decades by highlighting the major changes in policies that determine the incentive framework and their impact on manufacturing imports, exports and output. The

purpose of the study is not to develop an integrated model but to describe main developments in a more comprehensive manner. The simple econometric estimates used in the text are only to illustrate the basic stylized relationships as they relate to the manufacturing sector.

7.   The analysis and the results indicate that the Real Effective Exchange Rate (REER) has been one of the most important determinants of Indian imports and exports. On the export side, export incentives have also played an important role. On the import side, real exchange rates, together with import tariffs, have determined the allocation of demand for manufactured products domestic and imported goods. The overall level of demand for manufactured products and their output has been driven primarily by the growth of public expenditure. The import regimes, restrictive and more liberal, have contributed to the supply side response to aggregate demand. Increases in tariff rates have more than compensated for the relaxation in import policies. The net result of these policies has been a pattern of industrialization based on import substitution and financed largely by foreign savings. Despite attempts to liberalize the trade regime, share of trade in domestic output has actually shrunk during the 1980s.

B. EXPORTS, IMPORTS AND MANUFACTURING OUTPUT

8.   This section summarizes the behavior of exports, imports and manufacturing output, for the period 1970/71 to 1987/88, by focusing on the behavior of exchange rates, import taxes and government spending growth which jointly determine the structure of incentives in India.

(a) Exports

9.   India's export performance in the last two decades has not been impressive. Its share of world exports has declined from 0.98% in 1964/65 to only 0.45% in 1987/88. Its share of world manufactured exports has declined from 0.65% to around 0.4% during the same period (see Figure 1). Exports stagnated during the first half of the 1980s, averaging only around 0.4% p.a. growth rate for the 1979/80-1985/86 period, and declined as a percentage of

GDP. This decline was reversed in the last two years, with total exports growing at 13.5% per annum, led by a large increase in manufactured exports where growth averaged around 19% annually. The acceleration in growth was not large enough to recoup the share of world markets lost over the last decade. The relatively modest performance in exports can be attributed to the fact that the Indian Government has not traditionally placed much emphasis on exports which have usually been undertaken as a marginal activity and only actively promoted during periods of slackening domestic demand or when there were balance of payments pressures to earn more foreign exchange.

FIG. 1   SHARE OF WORLD EXPORTS
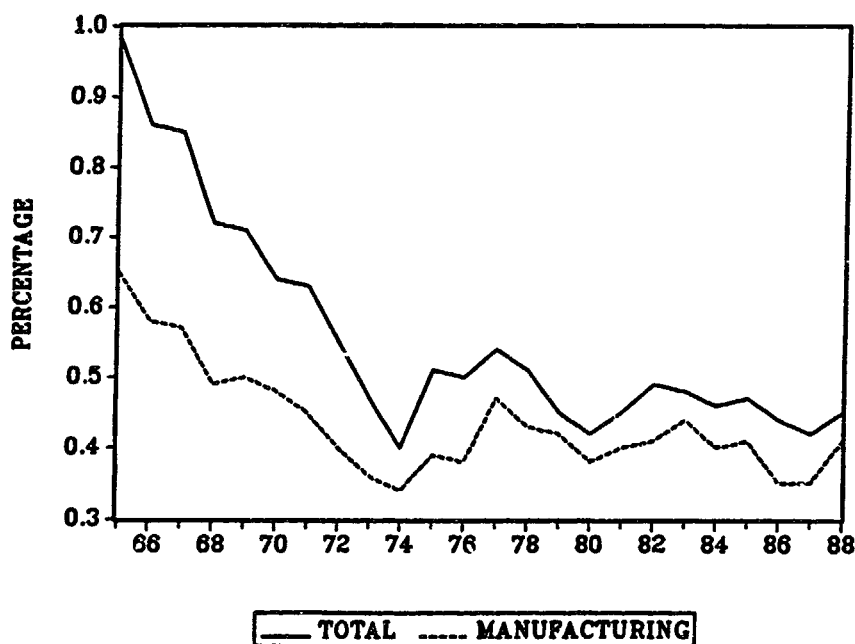
10.   Despite the fact that India has traditionally been a largely agrarian economy, its exports (in real terms) have been increasingly dominated by manufactured goods throughout the last two decades. In 1962/63, manufactured and primary exports each made up roughly 50% of total exports. In 1987/88, manufactured exports had increased their share to 65%. Between 1960/61 and 1987/88, total real exports grew at an annual average rate of 4.4%, while manufactured exports grew at 5.2% and primary exports grew at only 3.4%.

11.   Indian exports are found to be very sensitive to the real effective exchange rate. The following discussion divides 1970/71 to 1987/88 into four periods according to exchange rate movements and the corresponding export performances. The period 1970/71-1974/75 showed moderate growth for total exports of around 6% p.a. with manufactured exports growing at over 6% p.a. compared to the primary export growth rate of around 5.4%. However, this total export performance was not very impressive in terms of its share in world exports, as the percentage steadily declined from 0.63% in 1970/71 to 0.51% in 1974/75.

12.   A major turn-around occurred between 1975 and 1979 when the REER depreciated by around 30%. This depreciation of the exchange rate, steady increases in total export subsidies and the existence of under-utilized capacity in the manufacturing sector contributed to rapid growth of manufactured exports. Manufactured exports grew at an annual average rate of close to 24% in 1974/75-1976/77, which, together with a primary export annual average growth rate of around 8.6%, resulted in a total real export growth rate of nearly 17%. Between 1977/78-1978/79 the REER continued to depreciate, but manufactured exports increased only slightly, while primary exports actually declined. Primary exports fell by 22% in 1978, brought about largely by a 20% drop in food and animal exports.

13.   Between 1978/79 and 1984/85, the REER appreciated. This, together with declining export subsidies, led to export stagnation. For the period 1979/80-1985/86 total exports grew around 0.4% p.a. while manufactured exports only grew around 1.2% p.a. and primary exports actually declined at around 0.7% per annum.

14.   Over the last few years, 1984/85-1987/88, there has been a steep depreciation such that the REER reached its lowest point since 1970/71. At the same time, there was a sharp increase in total export subsidies. Specific steps were taken to streamline export administration. The effect of these policy changes was finally felt in 1986/87 and 1987/88, when export growth accelerated dramatically. For 1985/86-1987/88, manufactured exports grew at an annual average rate of around 19%, primary exports at around 5.4%, resulting in over 13% annual average rate of growth for total exports.

15. Structure of Exports. India's export products range from those produced
primarily for export to those exported at the margin after domestic demand has
been satisfied. According to this classification, India's exports can be
divided into three categories. Category A consists of goods produced almost
entirely for exports (gems and jewelry, marine products, etc.) and goods for
which production for export market is, for all practical purposes, separated
from production for the home market (such as garments, carpets and
handicrafts). Category B consists of traditional exports in which a
proportion ranging between 20% and 60% of total output is exported (these
include mostly raw material based products such as jute manufactures, leather
and leather manufactures, tea, coffee, etc.). Category C is non-traditional
manufactured exports in which around 10% or less of total output is exported,
(textiles, machinery, transport equipment, metal and steel manufactures,
chemicals, sugar and oilcakes and most consumer goods). Table 1 presents
these three categories of exports as shares of GDP.

TABLE 1: MAJOR CATEGORIES OF EXPORTS

	1970/71		1975/76		1980/81		1985/86		1986/87	
	Share of Exports	Share of GDP	Share of Exports	Share of GDP	Share of Exports	Share of GDP	Share of Exports	Share of GDP	Share of Exports	Share of GDP
Category A	25.97	1.10	30.91	1.57	44.65	2.40	45.01	1.98	47.04	2.26
Category B	39.45	1.67	31.27	1.59	27.38	1.47	26.50	1.17	26.93	1.29
Category C	34.58	1.47	37.82	1.92	27.97	1.51	28.48	1.26	26.03	1.25
Total	100.00	4.24	100.00	5.07	100.00	5.38	100.00	4.41	100.00	4.80

Source: Report on Currency and Finance, RBI, various issues.

16. Category A exports, products exclusively for export, show the largest
increase over time. Starting from around 26% of total exports in 1970/71,
category A exports grew to around 47% in 1986/87, making up the largest share
at that time. This could reflect that most government efforts to promote
exports have concentrated on export-oriented industries, or that the exchange
rate policy has the largest effect on these exports. Changes in domestic
demand have little effect on such exports since they are produced almost
exclusively for export purposes. Gems and jewelry have been the rising star

of this export category. The share of gems in manufactured exports has risen from around 4% in 1969/70 to around 21-22% in the last two years. For the period 1969/70-1985/86, gems averaged an annual growth rate of 16%, compared to 4% for all manufactured exports.

17.   Exports in the B category (jute, coffee, tea, etc.) show the largest decline as a share of total exports, from around 41% in 1970/71 to around 27% in 1986/87. This is despite the fact that among this group, leather exports have increased significantly. Supply shortages and increasing domestic demand probably explain this decline.

18.   Category C exports show a decline both in terms of shares of exports and shares of GDP. Capital goods and other manufactures make up the largest share of category C exports, and they are sensitive to changes in domestic demand: should domestic demand increase, these goods would be diverted away from the export market to meet domestic needs. The generally lower share of category C exports in the 1980s, compared to the 1970s, could be the result of the greater domestic needs evidenced in the higher rate of growth of industrial output. It is also due to the fact that the policy environment makes it very difficult to export such goods.

19.   Despite significant attempts to diversify exports and very rapid growth of engineering industries, their share in exports have declined during the 1980s. Thus, in 1988, India's exports were reduced to a few simple product groups that either had easy and duty free access to imported inputs (e.g., gems) or relied heavily on domestic inputs that are abundant and priced below world prices (e.g., cotton textiles and leather products).1/ More complicated products requiring multiple and complex inputs are penalized by very high input and capital costs as well as a very restrictive import regime. Although India has a full set of schemes to support exports and compensate for effects of protection and indirect taxes, the complexity of the import and tax systems have rendered them ineffective except for very simple products.


1/   Both cotton and raw hides exports are restricted leading to lower input costs for downstream users.

20.   **Export Equations.** Simple equations estimated separately for total and manufactured exports are presented below. These reinforce the findings in earlier studies that exports are highly sensitive to relative prices.

21.   It should be pointed out that there are serious measurement problems in deriving real export series. The price deflators for some product groups are highly suspect, leading to unreliable real export series. These problems are less serious for large aggregates such as total manufacturing or total exports. However, as soon as export categories are narrowed down, the errors introduced by price series increase significantly. Therefore, estimates for different categories of exports (i.e., A,B,C) are not presented. First, problems with price series become more serious. Second and more important, due to vent-for-surplus nature of some exports, the shifts in individual categories are large. For example, exports of sugar on a large scale have taken place in years of excess output, which by itself increases category B exports by more than 25% those years. Similarly, steel exports during the late 1970s when there were excess supplies led to large increases in category C exports. Finally, although demand and supply equations were estimated simultaneously, only reduced forms are presented above to illustrate the nature of relationships.

22.   Figure 2 illustrates the relationship between total real exports (in 1980/81 prices) and REER (adjusted for export incentives and taxes) over the 1971-1988 period.

FIG. 2   TOTAL EXPORTS AND REERS

REER ____ TOTAL REAL EXPORTS
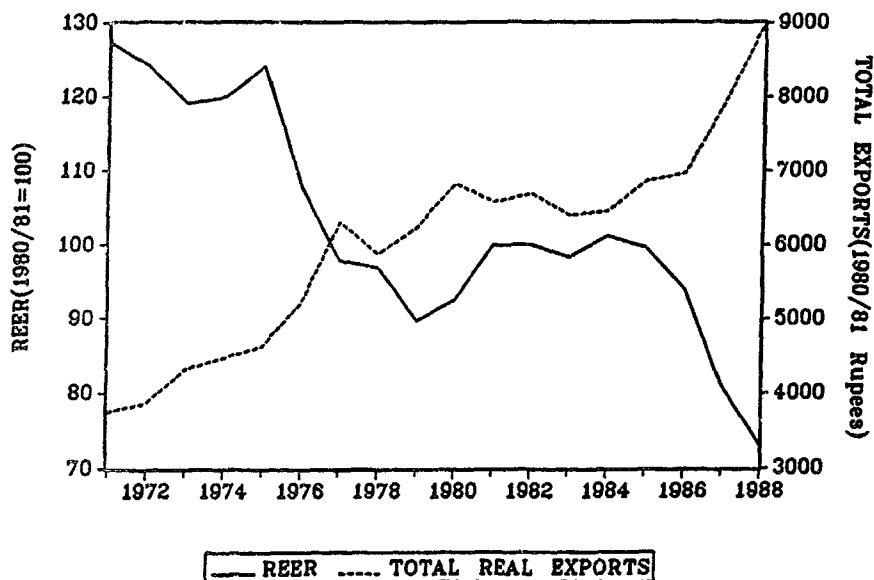
23.   Various formulations of a total export function were estimated. The best function fitted to explain total exports is a reduced form function containing both supply and demand factors. These include domestic demand, world demand and the real effective exchange rate. On the supply side, the change in domestic demand is important. On the demand side, world demand is important. The real effective exchange rate is a combined measure of relative prices on the demand and supply sides. Exporters respond to relative export to domestic price - the higher the relative price, the more exporters would supply. On the demand side, importers of Indian exports respond to relative world to Indian export price. The higher is this relative price, the more importers would demand of Indian exports. The real effective exchange rate is the multiplicative product of these two relative prices for India with respect to its trading partners weighted by their trade shares with India. Thus, the real effective exchange rate reflects relative price effects on both the demand and supply side. The function is estimated in first difference of logs (growth rate) form (hence all the variables begin with 'D'). The figures in parenthesis are t-statistics.

(1) DQXTT = 0.036 - 0.80 DTXREERA + 0.40 DQXWD - 0.73 DGDPMP
              (-4.68)   (1.28)   (-1.98)

Adj. R2 = 0.63
D.W. = 2.15

where QXTT = total exports; TXREERA = total export-weighted REER adjusted by net export incentives (export subsidies less taxes); QXWD = total world exports; and GDPMP = GDP in market prices, a proxy for domestic demand.

24.   The adjusted R-squared is 0.63, which is a reasonably good fit given that the function relates growth rates rather than levels. The change in the real effective exchange rate has a significant effect on the growth rate of total exports; the t-statistic is 4.68. The price elasticity is 0.8. Domestic demand l as a negative effect on total exports, with a coefficient of 0.73. This reflects the supply-constrained nature of exports in India. When domestic demand exceeds supply, exports are diverted from the foreign market

towards meeting domestic needs. On the other hand, when domestic demand is lagging, then the excess supply is exported on a marginal cost basis. Finally, foreign demand has a smaller and less significant effect on exports, with an elasticity of 0.4 and a t-statistic of only 1.28. This is due to the marginal nature of most of Indian's exports, as well as the small share of Indian exports in the world market.

25.   Structural functions were estimated for manufactured export supply and demand. On the supply side, domestic demand, availability of foreign exchange, manufactured export subsidies and the relative export to domestic price were found to be significant. On the demand side, relative export to world price was found to be significant. The function finally chosen is a reduced form function which consists of both supply and demand factors. Again, as in the case for total exports, the function was estimated in first difference of logs (that is, growth rate) form, as follows:

$$(2)\ DQXMT = 0.188 - 1.05\ DMFXREERA(-1) - 0.022\ RESMO(-1) - 1.06\ DGDPMF(-1)$$
$$(-3.84) \qquad\qquad (-2.11) \qquad\qquad (-2.02)$$

Adj. R2 = 0.54; D.W. = 2.39

where QXMT = manufactured exports; MFXREERA = manufactured export-weighted REER adjusted by export incentives; RESMO = reserves in months of imports and GDPMF = manufacturing GDP.

26.   The function explains over half of the growth rate of manufactured exports, with the adjusted R-squared being 0.54. The real effective exchange rate is a measure of combined price effects on both the supply and the demand sides. It is found to be very significant with an elasticity of 1.05. Foreign exchange reserves measured in terms of months of imports were found to have a significant negative effect on manufactured exports. The is probably because when foreign exchange reserves are low, the Government eases administrative controls faced by exporters and exhorts enterprises to export more. Lagged domestic output has a negative relationship with exports indicating that higher domestic demand leads firms to shift from the export to

the domestic market. Finally, world demand was found not to have an effect on Indian manufactured export growth, implying that constraints on manufactured exports are primarily due to supply rather than demand factors.

(b) Imports

27. Indian imports can be classified into three major categories according to their determinants. First, there are imports including food, petroleum and fertilizers which are determined by agricultural output, by domestic petroleum production, or by decisions on fertilizer imports. The Government allocates the available foreign exchange first to meet the needs for these imports. Second, there are imports including capital goods and other manufactures; undertaken only after these exogenous import requirements are satisfied. These imports are sensitive to exchange rates and tariffs. Given the exchange rate and tariffs, if demand for such imports exceeds supply of foreign exchange, then import restrictions are placed on them. Finally, imports of gems and jewelry fall under a unique category, since they solely cater to exports, and are a function of gem and jewelry exports.

TABLE 2: REAL IMPORTS AS A SHARE OF GDP AND PERIOD GROWTH RATES

| | 1962-66 | | 1967-70 | | 1971-74 | | 1975-77 | | 1978-81 | | 1982-88 | |
	Share	Growth Rate	Share	Growth Rate	Share	Growth Rate	Share	Growth Rate	Share	Growth Rate	share	Growth rate
Total	10.16	9.46	8.41	3.04	7.40	9.81	7.29	-0.77	8.13	10.19	7.94	3.18
Food & Animals	1.97	20.92	2.25	4.82	0.87	0.01	1.39	1.51	0.75	-2.53	0.77	1.76
Fuels & Lubricants	1.51	-2.63	1.36	1.87	2.82	25.03	2.42	9.58	3.29	15.83	2.63	-1.15
Gems & Jewelry	0.01	1.22	0.05	3.73	0.06	32.83	0.13	56.31	0.34	-5.12	0.37	14.94
Capital Goods	3.19	7.21	1.91	-6.19	1.30	5.32	1.20	9.43	1.20	5.69	1.55	9.55
Other Manufactures	3.48	-1.26	2.85	-3.04	2.35	-1.69	2.15	-22.93	2.55	11.32	2.62	2.87

Source: Report on Currency and Finance, RBI, various issues.

28. Table 2 shows the share of real imports in GDP and period growth rates for various import categories. Import composition and growth rates have changed substantially over the last two decades. These changes have resulted either from shocks (such as draughts and oil price increases) that increase the proportion of essential imports or from import policy changes. The

following discussion divides 1960/61 to 1987/88 into roughly four periods, each distinguished by the performance of reports which was influenced by the particular import regime at that time.

29. The period between 1960/61 to 1965/66, was characterized by buoyant investment growth in manufacturing, especially by the public sector (8.15% p.a. and 11.72% p.a. respectively) and the share of manufactured goods imports (especially capital goods imports) was high relative to investment and output. Although growth in manufactured goods imports was lower than that of output, the share of imports was quite high (almost 50% in 1962). Throughout this period, the import control mechanisms were increasingly tightened, but were still inadequate to counter an impending foreign exchange crisis. The outcome was the nominal devaluation of the rupee in June, 1966, followed by a partial and halting import liberalization, consisting mostly of the relaxation of import licensing and reduced import duties. These reforms were, however, short-lived, and the foreign exchange situation not only did not improve, but in fact deteriorated, due to two consecutive years of drought and inflation which wiped out the effects of the devaluation.

30. Between 1965/66 to 1976/77 the import regime got progressively more restrictive and complex. Attempts were made to contain balance of payments difficulties by increasing tariffs and tightening quantitative restrictions. Tariff collection rates on manufactured products were increased from less than 30% in 1969 to more than 50% by 1973. The import premia on REP licenses shot up to more than 100% despite the tariff increases. The tightening of the import regime was accompanied by further restrictions on investment licensing. There was a period of relaxation between 1970/71-1973/74, where imports rebounded partially, only to be reversed in 1974-75. These were the years immediately before and during the first oil crisis. The decline in imports in

1974/75 was actually a policy reaction to the inflationary tendencies2/ which were already accumulating in the economy prior to the onset of the first oil crisis. The import policy focused on selective imports of key consumer goods in short supply (such as foodgrains, edible oils and fibers) to ease inflationary pressures during 1974/75 and 1975/76. Imports of food and animals (as a percentage of GDP) increased, imports of fuels and manufactured goods declined. After the cutback in 1974/75, real imports remained at more or less the same level until 1976/77, registering an annual average growth rate of around 1% for the 1974/75-1976/77 period. In 1975 the exchange rate started to be depreciated and by 1978/79, it had depreciated by 30% in real effective terms. The depreciation eliminated some of the premia on imports, and exports responded by increasing rapidly until 1978/79. Increasing exports, tight imports, low investment and increasing workers remittances improved the level of reserves and the Government in 1977/78 began a partial liberalization policy of relaxing the import controls.

31. This import liberalization phase was aided by the two bumper harvests in 1977/78 and 1978/79, as well as an unanticipated growth of private remittances, both of which led to the accumulation of food and foreign exchange reserves. It was in the face of these growing reserves, as well as pressure from constituencies in industrial areas where output, profits and employment were being disrupted by recurring raw material shortages, that the Indian Government began to relax import controls and quantitative restrictions. This resulted in high real import growth which averaged around 11% p.a. between 1977/78 and 1980/81.

2/   Before the onset of the first oil shock in 1973, the peak agricultural harvest of 1970/71 was followed by a slight reduction in 1971/72 and a severe drought in 1972-73 when real income originating in agriculture declined by 6.36%. The influx of refugees from what was then East Pakistan, resulting in the creation of Bangladesh in 1971 led to a steep rise in defense expenditure. Consequently, the annual rate of inflation as measured by the WPI accelerated progressively from 2% around April 1971 to about 17% by September 1973, the beginning of the oil price hike.

32.   In contrast to the decline following the first oil shock, total real imports increased in the aftermath of the second oil shock. These different policy responses were primarily due to the different initial conditions. By the eve of the second oil shock, the Indian economy had built up quite a bit of reserves, both in food and in foreign exchange, and the policy response at the onset of the crisis was continued liberalization of imports for the purpose of promoting efficiency as well as continued imports of food, edible oil and fibers to curb inflationary pressures. Real capital and intermediate goods imports increased by 25.8% and 20.1% respecti·· ly in 1980/81. Imports of fuels and lubricants increased by close to 10% in real terms in that same year. Food and animal imports increased by nearly 50% in real terms due to the drought of 1980.

33.   Since 1980/81, the share of exogenous imports (food and fuels) has declined while the share of manufacturing imports has increased. Food imports have fallen by nearly half as a share of GDP from 1971 to 1988, a reflection of improved supply conditions. Real imports of fuel showed a generally declining trend as the supply conditions eased with domestic discoveries of oil and gas.

34.   Despite the liberalization attempts, real import growth only averaged around 5% per annum for the 1980/81-1987/88 period, in part due to the depreciation of the rupee and in part to large increases in import tariffs. The share of imports to GDP, although slightly higher than the levels observed in the 1970s, have declined in the late 1980s.

FIG. 3   IMPORTS OF MANUFACTURED PRODUCTS

CAPITAL GOODS ..... OTHER MANUFACTURING
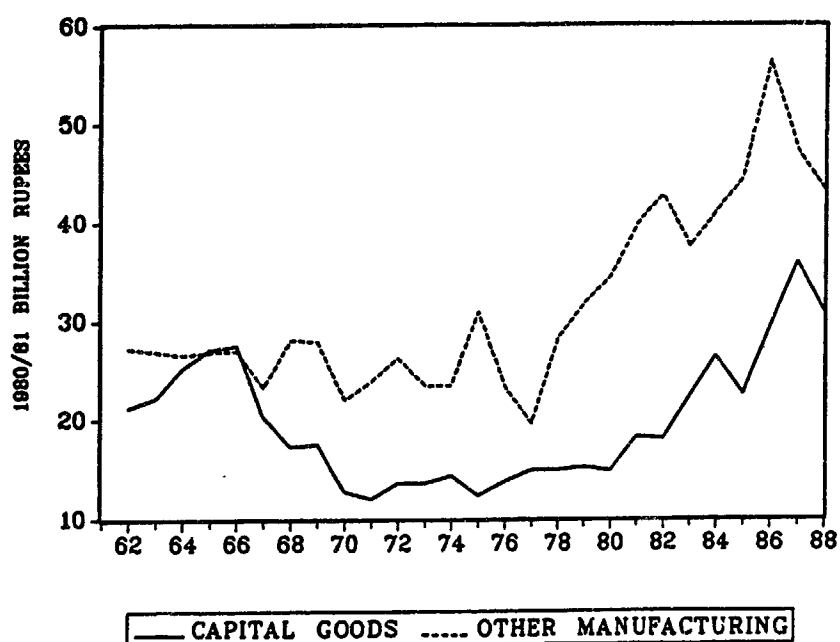
35. Manufacturing Imports. Figure 3 shows the two components of manufactured goods (capital and intermediate goods) in 1980/81 prices. There was an acceleration in the growth of capital goods imports in the 1980s. From 1981/82 onwards, real imports of capital goods increased at a trend rate of around 5% per annum, though with some fluctuations. The large increase in 1985/86 and 1986/87 is due to sharp reduction in capital goods tariffs (from around 100% to first 45% and then to 55%). This abated by 1987/88, reflecting the reduction of pent-up demand, some tightening of restrictions in response to pressure from domestic suppliers, and the unification of tariffs on capital goods imports at a higher average level (90%).

36. Imports of other manufactures followed a generally declining growth trend until the 1980s when there was a dramatic increase. This coincided with the beginning of the import liberalization phase, but also reflects a stock adjustment in response to lifting the more stringent restrictions on these imports. The decline in 1986/87 and 1987/88 coincides with the increasing tariffs and depreciating exchange rate that increased import prices relative to domestic prices.

37.   The real exchange rate and tariff levels have had an important effect on
manufacturing imports. The level of economic activity determines the overall
level of demand for manufactured goods, but the decision to import or use
local supplies depends on the prices of imports relative to domestic prices.
The average tariff collection rate (a proxy for tariff production) has
increased dramatically from about 20% in 1970 to 63% in 1988. Average tariff
collection rates on manufactured products have increased from less than 50% in
1979 to more than 70% (80% excluding duty-free imports) in 1988. Figures 4
and 5 illustrate the relationship between share of imports and relative price
of capital and intermediate goods.

38.   Figure 4 shows the share of capital goods imports in gross fixed
investment in machinery (both in 1980/81 prices) and the price of imported
capital goods (inclusive of tariffs) relative to the domestic wholesale price
index of capital goods (inclusive of domestic excise taxes). The relative
price is standardized to be 100 in 1980/81. The left axis measures the
relative shares; right axis measures the relative prices.

FIG. 4 RELATIVE SHARES AND PRICES OF IMPORTED CAPITAL GOODS

SHARE OF IMPORTS ..... RELATIVE PRICE OF IMPORTS
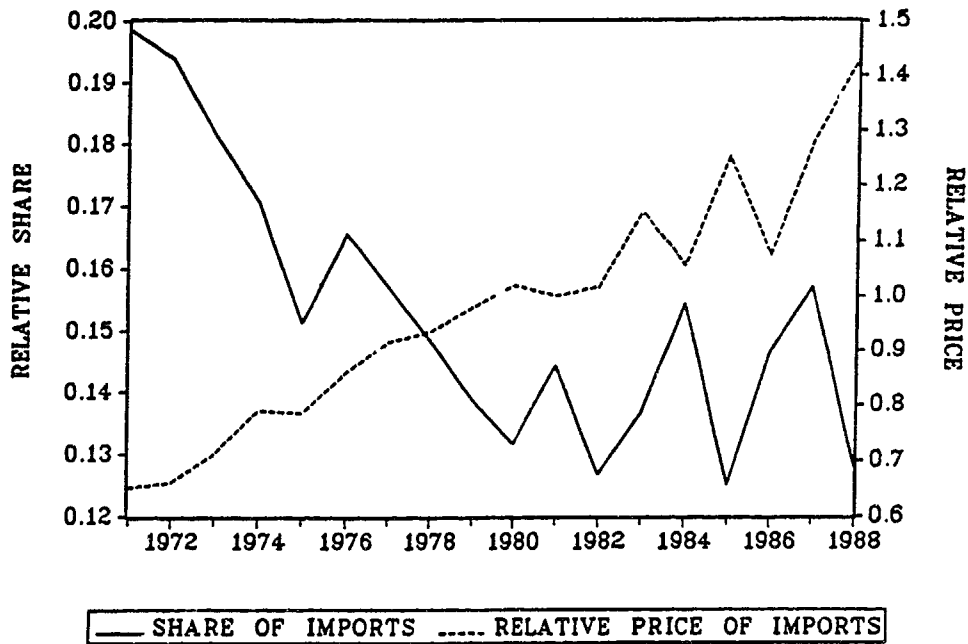
39.   The graph indicates that the decision on whether to use domestic or imported capital goods is quite sensitive to the relative prices of capital goods. The share of imported capital good in total investment in machinery and equipment has fallen from about 50% in 1961 to 20% in 1971 and to only 13% in 1988 mirroring the increases in import prices. Since 1981 the index of relative import prices rose from 100 to almost 150. More than 60% of this increase resulted from higher import tariffs relative to domestic taxes; the

other 40% came from real depreciation of the exchange rate.3/ Competition in many areas of capital goods industry has not allowed domestic producers to increase their prices in line with increases in import prices.

40.   Imports of capital goods are modelled as a function of relative import to domestic prices, the import duty on capital goods, as well as the final domestic demand for capital goods (here gross fixed investment in machinery is used as a proxy)4/. An alternative specification was also attempted which included domestic excise duty on the capital goods side. This was found to be insignificant, probably because there was very little movement in the domestic excise duty compared with the import duty. The function is estimated in first difference of logs (growth rate) form, as follows:

(3) DQMKG = 0.01 + 1.16 DGFIMH - 0.80 DRPKGWOT(-1) - 0.57 DKGDUTY
                      (3.05)   (-2.98)   (-4.46)

Adj. R2 = 0.79; D.W. = 2.34

where QMKG = imports of capital goods; GFIMH = gross fixed investment in machinery; RPKGWOT = relative import to domestic prices of capital goods before taxes; and KGDUTY = import duty on capital goods.

41.   The function explains changes in capital goods imports very well, with an adjusted R-squared of 0.79 which is very high for a first difference equation. All the coefficients are very significant, with high t-statistics. The strong effect of relative prices and import tariffs on imports of capital

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3/   The average tariff rates on machinery have increased from about 30% in
      the late 1970s to almost 70% in 1988. The decline in relative prices in
      1985/86 is due to reduction in tariffs for project imports to 45%.
      Tariff rates were subsequently raised to 55% in 1986/87 and to 90% in
      1987/88. Currently they are 80%.

4/   This is strictly only an import demand function. Given that India's
      imports of these goods make up only a very small share of the world
      market, it can be safely assumed that India faces a perfectly elastic
      supply function.

goods is thus supported by econometric evidence. The price elasticity is 0.8 and the demand elasticity is 1.16. Import duty has a significant negative effect on capital goods imports, with an elasticity of around 0.6.

FIG.5 RELATIVE SHARES AND PRICES OF IMPORTED INTERMEDIATES

SHARE OF IMPORTS ----- RELATIVE PRICE OF IMPORTS
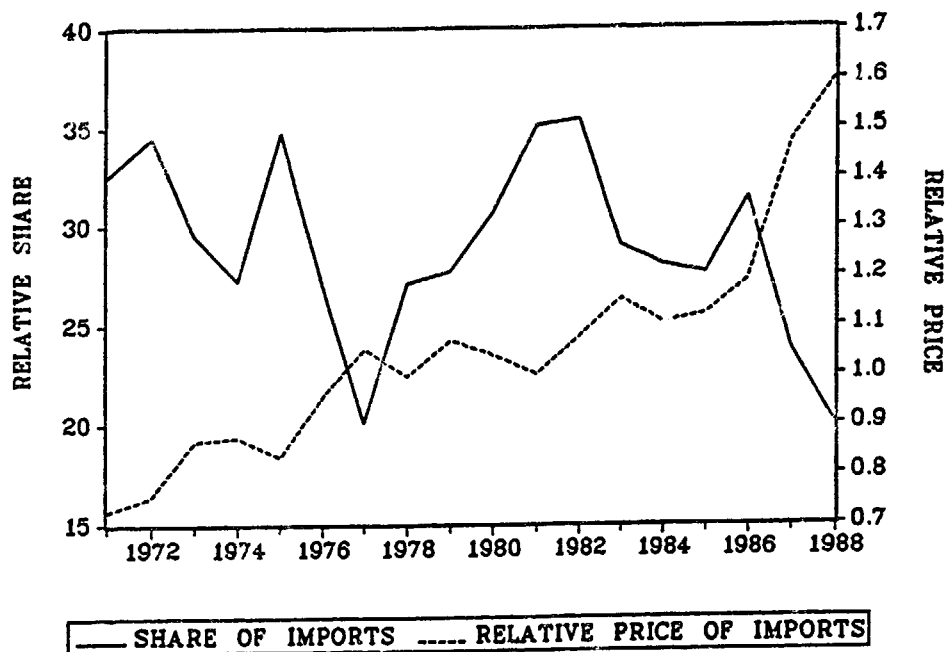
42. A similar picture emerges when the share of imported in Indian-made intermediates is examined. Figure 5 plots the share of intermediate goods imports to domestic production of intermediates on the left axis and the relative prices of imported intermediates (inclusive of tariffs) to domestic prices of similar goods (inclusive of excises) on the right axis. It shows that the relative prices of imports to domestic prices have increased, especially in the late 1980s, and the relative share of imports has declined. About 70% of this relative price change results from an increase in tariffs on intermediates (from 52% in 1981 to 80% in 1988). The rapid rise in the share of imports after 1976/77 reflects the relaxation of QRs with the 1977/78

Import Policy Order. As of 1988, imports of intermediates have narrowed to the few product groups which are either not available in India or whose domestic supply has not caught up with demand.

43. Imports of intermediate goods are modelled as a function of relative import to domestic prices, import duty on intermediate goods and manufacturing output which represents the domestic demand for intermediate imports. As in the case for capital goods imports, this is an import demand function as one can safely assume that the import supply of intermediate goods facing India is perfectly elastic. The function is estimated in first difference of logs (growth rate) form, as follows:

(4) DQMOT=0.04 - 1.53 DRPOTWOT - 0.55 DRPOTWOT(-1) - 0.9 DOTDUTY + 1.48 DGDPMF

           (-4.01)   (-1.44)   (-3.72)   (1.94)

Adj. R2 = 0.68; D.W. = 1.93

where QMOT = imports of intermediate goods; RPOTWOT = relative import to domestic price of intermediate goods before taxes; OTDUTY = import duty on intermediate goods; GDPMF = manufacturing GDP.

44. The function explains changes in intermediate goods imports very well, with an adjusted R-squared of around 0.7. Again, as in the case of capital goods imports, relative prices and import duty have a large impact on intermediate goods imports. The short-run price elasticity for intermediate goods imports is 1.5, the long-run price elasticity is 2.1 and the demand elasticity is 1.5. The elasticity of import duty on intermediate goods imports is around 1.5.

(c) Behavior of Relative Prices

45. The behavior of import to domestic prices suggest that the import and domestic prices are not being equalized, at least on the aggregate level. Similarly, analysis of export to domestic prices suggest that they also have increased during the 1980s. Fig. 6 shows the ratio of import and export to domestic prices for manufactured products.

FIG. 6 RELATIVE PRICES OF IMPORTS AND EXPORTS

IMPORTS ..... EXPORTS
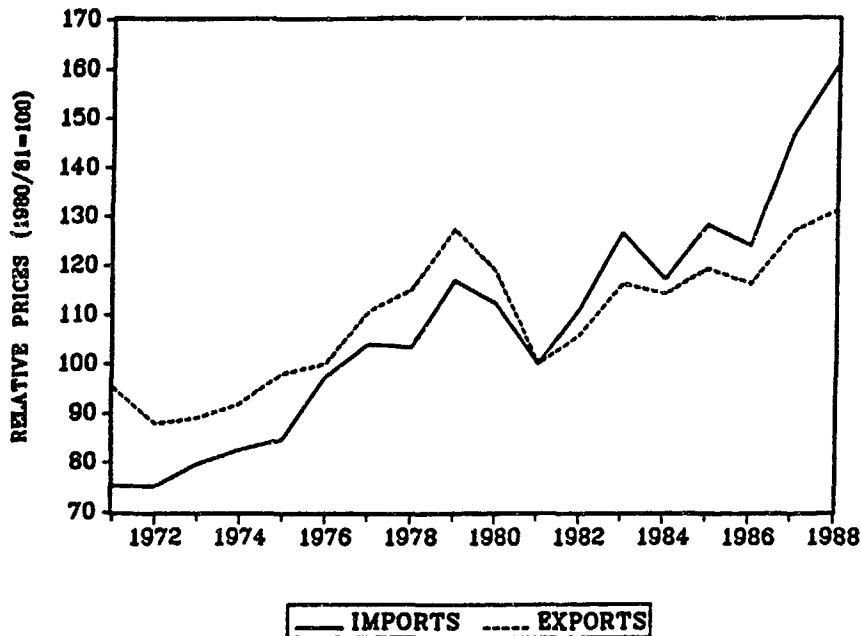
The relative price of imports is constructed by dividing the landed import price index of manufactured products (including average tariff collection rate) with the wholesale price index for manufactured products (including average excise tax collection rate). Similarly, relative price of exports is the ratio of export price index of manufactured products (including export subsidies) to wholesale price index for manufacturing. All series are standardized to be 100 in 1980/81.

46. Changes in relative prices of exports show shifts in incentives, for a domestic producer, between selling in the domestic market and exporting. It also indicates changes in the relative profitability of investing in products sold in the domestic market compared to products that are exported. In the 1980s, especially after 1986, the relative profitability of exporting has

increased. This is also consistent with the acceleration of export growth after 1986. However, relative export prices in 1988 had not reached the levels obtained in the late 1970s.

47. Changes in relative price of imports show the shifts in incentives for importing or buying from the domestic market. It also indicates the changes in profitability of investing in import substituting industries. Relative price of imports has increased rapidly in the 1980s.5/ One major determinant of this increase has been the increase in tariffs relative to domestic excise taxes.

48. Average tariff collection rates have increased from about 20% in 1970 to 32% in 1978 to more than 60% in 1988. Easing of entry barriers and rapid increase in total productivity has not allowed domestic producers to increase their prices in line with the increases in import prices.

49. Comparison of relative prices of imports and exports will indicate the profitability of investing in activities to replace imports versus investing in products for export. This ratio has moved in favor of investing in import substitution activities. The main reason for this change is the greater increase in import tariffs compared to export subsidies. This development is also consistent with the observation that the bulk of new investments are flowing into production of intermediates, which are currently imported.

50. The increase in relative prices of imports and exports implies that the prices are not being equalized between imports, exports, and domestic output. This is due to the nature of imports, exports, and administrative pricing in India. The share of manufacturing exports in gross output is very low (less than 5%) and exports are concentrated in a few lines produced primarily for the foreign market. Changes in export prices do not have a sizable effect on domestic prices. Imports also have similar characteristics. If the import penetration ratios (import to gross output ratios) are analyzed in more

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5/   The relative import prices for pre-1978 years should be treated with caution. These years had very high premia on imports which are not reflected in the official price series. So in reality, relative import prices were probably much higher than shown here.

detail, most industries in India have negligible imports either due to QRs or tariffs. Of the 66 subsectors within manufacturing only 16 have import ratios of more than 10%. Of these, 6 are in the industrial machinery sector, 4 in chemicals, 2 in metals, 2 in electrical appliances and electronics, and the other two are paper products and miscellaneous manufacturing. Even within the subsectors that have high import penetration ratios, the imports are concentrated in a few product groups which are not available in India. In paper products, imports consist of pulp and newsprint where India does not have sufficient raw materials and imports were canalized and allocated to mills and newspapers. In inorganic chemicals, a very large proportion of imports consists of phosphoric acid, because India does not have indigenous phosphate rock. In the soaps and cosmetics subsector (within chemicals), palm oil constitutes 90% of imports. In electronics, the bulk of imports consists of components for computers and TV picture tubes. Thus it is only in organic chemicals, synthetic fibers, metals, and machinery subsectors that there are imports across a wide spectrum of products. Furthermore, it is in these three subsectors that the tariffs are very high and also have increased more than other subsectors. In addition, the items that have significant imports are either canalized or restricted through alternative licensing procedures.

51. Another reason for non-equalization of domestic and import prices is the implicit or explicit price controls and canalization. The public sector supplies a large portion of intermediate goods (especially in metals and chemicals) and thus either directly controls their prices, or controls the prices of imports through public sector canalizing agencies. Supplies of many of these commodities are also rationed to actual users. Thus, firms which need more inputs (both imported and domestic) than are supplied by the rationing system have to import the difference (either directly or through REP licenses) at a higher landed price.

52.   For most other product groups, the share of imports is so small that these subsectors can be treated as essentially autarkic, with prices being determined primarily by domestic demand and supply.6/ The level of tariffs for the few products that are imported only determines which products are attractive for further import substitution. Government behavior which either places the products with sufficient domestic output in the restrictive import categories or increases tariffs when international prices decline reinforces the autarkic behavior in these markets.7/ However, in subsectors where import ratios are higher, import prices do influence domestic prices.

53.   Partial evidence for this hypothesis is given by the behavior of prices of different products. Table 3 shows the 1987/88 price indices of product groups that have high import penetration ratios and compares them to the overall manufacturing wholesale price Index (WPI). In 1987/88, the WPI for manufacturing was 385 (1970/71=100). Domestic prices of product groups that have high import penetration ratios have increased faster than the overall price index in manufacturing.

6/   In this context, deregulation has a very important effect on domestic prices. Easing of entry barriers in many subsectors lead to a rush of investments and eventually creation of excess supplies. These excess supplies prohibit many firms from enjoying the full protection permitted by the tariffs. Thus for many product groups, domestic prices are much lower than landed import prices.

7/   In many products, Government agencies import the products at high tariffs and sell at a price that is lower than the landed price cross subsidizing the imports through charging other levies on domestic production. This is prevalent in many petrochemical products.

TABLE 3: 1987/88 PRICE INDICES OF SELECTED PRODUCTS
(1970/71=100)

Products	Import Ratio (%)	Price Index	% of Average Price Index for Manufacturing
Total Manufacturing	9	385	100.0
(Excluding Food Products		(375)	
Paper	16.5	406	105.5
Pulp		417	108.3
Newsprint		541	140.5
Organic Chemicals (Benzene)	57	750	194.8
Soaps (Essential Oils)	20	800	207.8
Iron and Steel	31	567	147.3
Rails		886	230.1
Non-Ferrous Metals	28	467	121.3
Machinery	24		
Machine Tools	18	511	132.7
Textile Machinery	20	508	131.9
Mining Machinery		547	142.1
Boilers (BHEL)		727	188.8

Source: Revised Index Numbers of Wholesale Prices in India, April 1988.

54.   Since the share of imports of these products is very small and concentrated on a few products, their effect on the overall price level has also been small.8/ In areas where domestic supply exceeds domestic demand, firms cannot increase their prices to the landed price of imports. The deregulation of domestic industry, by increasing domestic supply, erodes the high profit margins and significantly reduces the effective protection enjoyed

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8/   Most new products in electronics, electrical machinery and organic chemicals are not in the price index. If the base year is changed to include new products, average price increases would be higher.

by domestic producers. However, as long as there are large imports (domestic supply being significantly less than domestic demand), in the absence of price controls, domestic prices tend to move together with landed import prices.

(d) Manufacturing Output

55. The growth performance of the manufacturing sector has shown large fluctuations, corresponding to changes in the trade regime and macroeconomic policies. While the basic import substitution thrust of the policy regime has not changed since the 1960s, the tightness of import licensing and exchange rate policies have shown major variations. Similarly macroeconomic policies have fluctuated between being highly restrictive and expansionary. This section analyzes the manufacturing sector performance in different subperiods categorized by Government policies for the trade regime and macroeconomic policies.

56. Trade Regimes. The 1960-1988 period can be separated into three subperiods of varying stringency of import regulations. These subperiods are 1960/61 to 1965/66, 1966/67 to 1976/77 and 1977/78 to 1987/88. These subperiods differ in terms of Government policy, behavior of imports and growth of output. Imported inputs and capital goods increased marginally between 1960/61-1965/66 when they accounted for almost 50% of manufactured GDP; were drastically restricted between 1966/67 and 1976/77, declining in absolute terms despite an output growth of 53%, and relaxed following the 1977/78 Import Policy.

57. Table 4 presents the growth rates of key variables for the three subperiods.

TABLE 4: TREND GROWTH RATES
(percent p.a. in 1980/81 prices)

	1960/61-65/66	1966/67-76/77	1977/78-87/88	1960/61-87/88
GDP Total Manufacturing	6.76	4.25	6.24	4.83
GDP Registered Manufacturing	8.40	4.44	7.38	5.32
Public /a	19.30	5.22	7.08	6.54
Private /a	6.52	4.25	7.09	4.91
Total Imports	5.87	1.39	4.36	2.92
Manufactured Imports	2.81	0.01 /b	6.50	2.57
Capital Goods	7.21	-2.93	9.00	0.87
Intermediates	-1.26 /b	1.4 /b	4.92	3.09
Gems and Jewelry	1.2 /b	8.09	7.51	12.88

/a Up to 1986/87.
/b Not Statistically different than 0.
/c 1970-88.

Source: National Accounts, CSO, Report on Currency and Finance, RBI and World Bank Estimates.

58.   Between 1960/61 and 1965/66, manufacturing investment, especially in public sector firms, grew very rapidly (8.15% p.a.) and the shares of imported inputs and capital goods were high relative to investment and output. Although manufacturing import growth was lower than that of manufacturing output, the share of imports was quite high (almost 50% in 1962). Despite the balance of payments crisis and droughts, the manufacturing sector grew quite rapidly. Investments increased along with output and the public sector took the lead in this growth.

59.   Between 1965/66 and 1976/77, the import regime got progressively more restrictive and complex. Despite increases in tariff collection rate on manufactured imports (from 30% in 1969 to more than 50% in 1973) the premia on imports, through REP licenses, increased to more than 100%. This decade of basically restrictive import policies led to serious stagnation, not just in terms of low output growth but also very low and even negative productivity growth (Ahluwalia (1985)). Restrictions on imports of capital goods and technology slowly delinked Indian industry from the rest of the world both in terms of production efficiency and quality. Output growth in registered manufacturing declined from about 8.5% p.a. during the 1961/62-1965/66 period to 4.5% p.a. between 1966/67 and 1976/77. Private sector growth decelerated

from 6.5% to 4.2% p.a. Even bigger declines took place in private investment growth. Most of the growth and investment took place in the public sector. Imports showed a similar stagnation, not growing for almost a decade, while capital goods imports actually fell in real terms.

60. The third period started in 1977/78, when restrictions on imports started to be relaxed. This gradual relaxation has continued until the present. The relaxation on imports was also accompanied by the easing of industrial regulatory policies, especially capacity licensing and controls on imports of capital goods. These reforms, accompanied by a significant increase in real government spending, led to the acceleration of growth of value added in manufacturing from 4.3% p.a. during the 1966/67-76/77 period to 6.2% p.a. during 1977/78-1987/88. The registered manufacturing sector has done even better, with its annual growth rate increasing from 4.4% to 7.4%. While increasing domestic demand, fueled by growing real government spending, has been one of the causes of this faster manufacturing growth, gradual deregulation and delicensing and greater availability of imports have encouraged domestic competition allowing firms to adjust their output to match growing demand.

61. **Role of Public Sector.** One of the important determinants of manufacturing growth has been the rapid expansion of public sector enterprises. For the 1961-87 period, public manufacturing sector grew at around 6.5% p.a. compared to about 5% p.a. for the private registered manufacturing. Since 1978, both public and private sectors have grown at about the same rate of 7% p.a. Nevertheless, the share of public sector in registered manufacturing GDP increased from 12% in 1961 to 30% in 1987.

62. The role and importance of the public sector go beyond its share in manufacturing GDP. Central government public enterprises (CPEs) have monopolized production of key raw materials and important intermediate goods (energy, non-ferrous metals, oil refinery products for petrochemicals). In heavy industries such as steel and fertilizers, CPEs account for about half of domestic production, and about one-third in pesticides and pharmaceuticals. Sectors in which CPEs predominate are aromatics and olefins (share of 54% to 100%), heavy electrical equipment (100% for hydro and steam turbo-generators),

telecom equipment (100% for coaxial and telephone cables, central switch-boards), public transport equipment (100% in railway coaches and ship-building), and watches (66% of production). The rapid expansion of CPEs in the 1970s (including the take-over of bankrupt private enterprises) slowed down in the late 1980s. Nevertheless, the Government continues to create two to three new CPEs each year (e.g., steel plants, chemical industries).

63. **Behavior of Fixed Investment.** Gross fixed investment (GFI) in manu-facturing has been an important determinant of the rate and pattern of growth of the manufacturing sector. Periods of import tightening have also been accompanied by restrictions on investment and imports of capital goods and technology. Table 5 gives the growth rates of fixed investment over the three subperiods.

TABLE 5: **INVESTMENT GROWTH RATES IN MANUFACTURING**
(percent p.a.)

	1960/61-65/66	1966/67-76/77	1977/78-87/88	1960/61-87/88
Total Gross Fixed Investment (GFI) in Machinery	10.5	5.4	9.0	5.8
GFI in Registered Manufacturing	8.2	2.7	7.2	4.2
Public/a	11.7	5.7	9.4	6.3
Private/a	6.2	-0.5/b	4.8	2.5
Capital Goods Imports	7.2	-2.9	9.0	0.9

/a 1961-1987.
/b Not statistically significant.

Source: National Accounts. CSO, World Bank Estimates.

64. Gross fixed investment in registered manufacturing has increased at 4.2% p.a. since 1961. These growth rates again show different behavior in different subperiods. The growth rates increased until 1965/66, declined sharply during the 1965/66-1976/77 period of tight import policies and increased again after 1977/78 together with reforms in import and regulatory policies. Public sector investments grew much faster than private sector investments throughout this period. The share of public sector investment to total registered manufacturing investment increased from 36% in 1960/61 to 41% in 1965/66 and finally to 63% in 1985/86. Imports of capital goods, overall, have increased much more slowly (0.87% p.a.) than overall fixed investment in

machinery (5.78% p.a.) or fixed investment in manufacturing (4.2% p.a.);
showing the import substitution that has taken place in the machinery
subsector.

65.   While growth of output has shown the same cycles as that of fixed
investment, efficiency of fixed investment has been higher under more liberal
policy regimes. Figure 7 shows the capital-output ratios, for public and
private registered manufacturing.

FIG. 7 CAPITAL-OUTPUT RATIOS IN REGISTERED MANUFACTURING

PRIVATE SECTOR ----- PUBLIC SECTOR
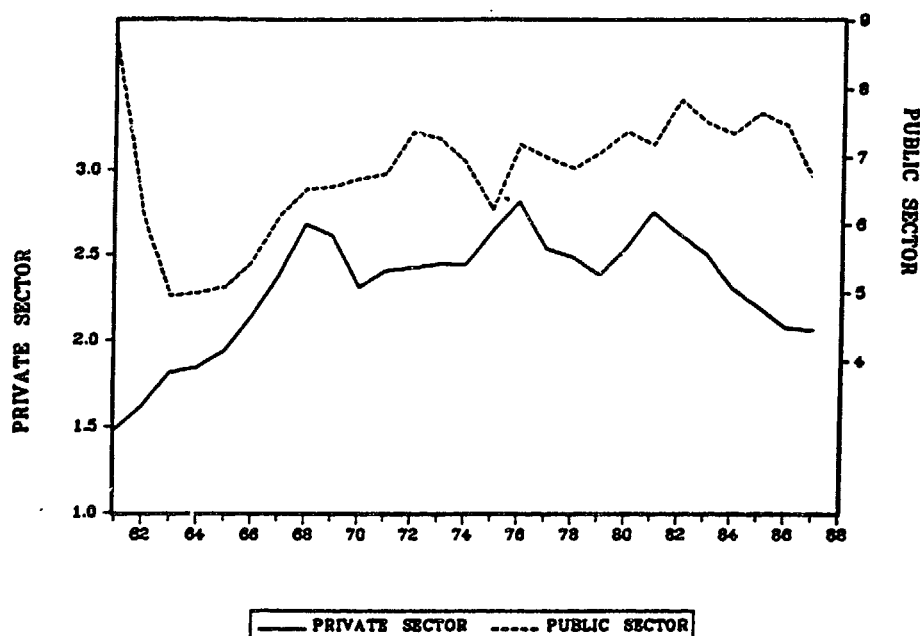
66.   Two important conclusions emerge from Figure 7. First, capital-output
ratios in the public sector (shown on the right axis) are almost three times
higher than those in the private sector (shown in the left axis). Second,
changes in the capital-output ratio for the private sector coincide with
restrictions on imports and the share of manufactured imports to output. For
the private sector, capital-output ratio increases steadily with some annual
fluctuations, from 1.5 in 1961 to 2.8 in 1976, almost doubling in fifteen
years. With the partial relaxation of import controls in 1977/78, the

capital-output ratio begins to decline and is about 2.0 in 1987/88.9/ Thus despite much faster rates of gross investment in periods where import policy was more accommodating, the efficiency of capital was higher.10/ Capital-output ratio for all of manufacturing has declined less (3.7 in 1976 to 3.1 in 1988) due to the predominance of public sector in fixed investment (around 50%) compared to its share in GDP (around 25%). Continued public sector investments in sectors where capital-output ratios are high as well as chronic inefficiency of project implementation have maintained public sector capital-output ratios at extremely high levels.

67.   Recent estimates on total factor productivity (TFP) growth also indicate that TFP growth has increased significantly in the 1980s (Ahluwalia (1991)). TFP growth in registered manufacturing which averaged -0.3% p.a. between 1965/66 and 1979/80, increased to 3.9% p.a. between 1980/81 and 1985/86. While part of this difference is caused by faster growth in the 1980s and better capacity utilization, the elasticity of TFP growth with respect to value added growth has doubled from 0.4 in the 1970s to 0.8 in the 1980s. Furthermore, there is somewhat weaker evidence that TFP growth is negatively correlated with the degree of import substitution.

68.   Macroeconomic Policy. Another important development in the 1980s has been a more rapid growth of public expenditure, especially government consumption. The share of public absorption in GDP (investment plus consumption) has risen from less than 20% in the 1970s to more than 32% in 1990. The main cause of the increase in public expenditures has been the rise in government consumption from 9% to 12% of GDP in the 1980s. Increasing government consumption share has come largely from fast-growing net purchases of commodities and services (average real growth of 17.5% over the first 5 years of the Seventh Plan). Compensation of employees increased at about half this rate (8.4% p.a.). The increase in Government expenditures, to a large extent, was met through public sector deficits. The ratio of public sector


9/   The increase in 1980 and 1981 are due to two draught years which reduced manufacturing output.

10/   Of course, it is hard to separate the effects of faster growth and capacity utilization from increases in efficiency.

financing gap to GDP increased from 3.6% in 1970/71 to about 7% in 1981 and about 8.9% in 1989. As a result, the consolidated central and state government debt grew to 66% of GDP at the end of 1989/90.

69. Rapid growth of domestic demand driven by public expenditure, substantial increases in tariffs and a more accommodating import policy after 1977 have all led to rapid growth of manufacturing output in the 1980s. Figure 8 illustrates the relationship between manufacturing output and real government spending. It shows the growth rates of real government expenditure (lagged one year) and the growth rate of manufacturing output. The two series are strongly correlated. The deviation between the two series reflect the fluctuations in agricultural output, which also has a significant effect on manufacturing output.

FIG. 8 MANUFACTURING AND GOVERNMENT SPENDING GROWTH

MANUFACTURING GROWTH ..... LAGGED GOVERNMENT SPENDING
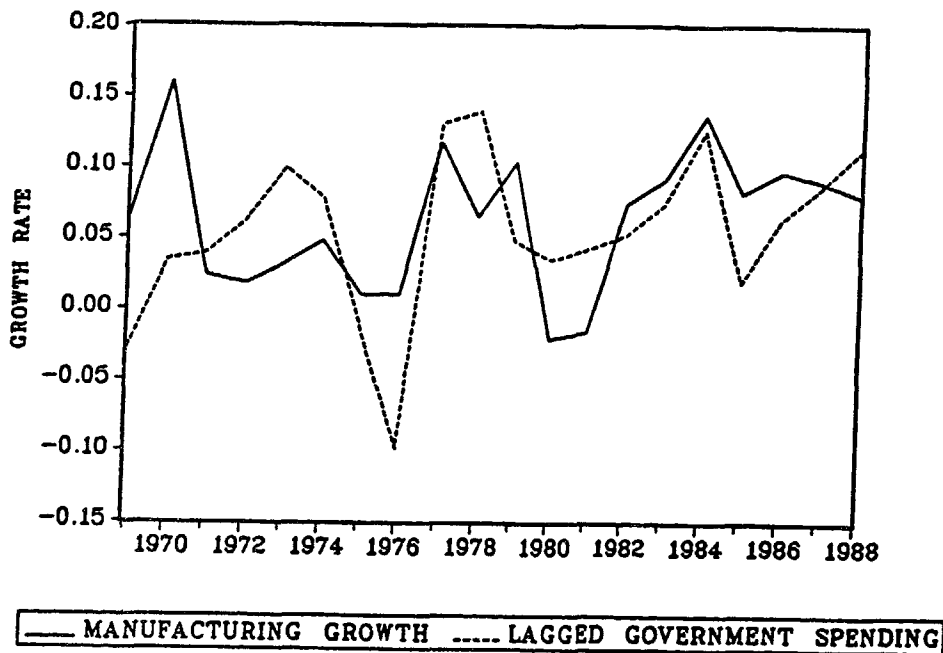
70. Econometric analysis of manufacturing output supports the hypothesis that output growth is largely determined by public expenditure, fluctuations in agricultural output, a more accommodating import policy as well as a more

relaxed industrial regulatory regime. Agricultural output has both supply and demand effects. On the demand side, agricultural incomes constitute a major force driving domestic demand given the largely rural-income based characteristic of Indian population. On the supply side, agricultural output provides intermediate inputs into manufacturing production. Total government spending is another major factor affecting output demand, partly through the multiplier effect but also because the public sector is responsible for a sizeable proportion of output as well as investment. Tariff-adjusted import prices as well as the tightness of the import regime (resulting from quantitative restrictions), both of which affect the availability of imported inputs, are important determinants for output supply. An import intensity ratio (intermediate imports as share of manufacturing GDP) used as a proxy for the tightness of the import regime is statistically significant. Finally, the relaxation of the numerous regulations imposed on the industrial sector since 1984/85 also has a positive effect on output supply.

71. The function for manufacturing output is estimated in first difference of logs (growth rate) form, as follows:

$$DGDPMF = 0.01 + 0.49 \; DTGOVT(-1) + 0.36 \; DGDPAG(-1) + 0.41 \; DGDPAG$$
$$\quad\quad\quad\quad (5.01) \quad\quad\quad\quad (4.94) \quad\quad\quad\quad\quad (5.81)$$
$$\quad\quad + 0.061 \; DMINTOT(-1) + 0.023 \; DUM8588$$
$$\quad\quad (1.92) \quad\quad\quad\quad\quad (2.32)$$

Adj. R2 = 0.79; D.W. = -1.93

where GDPMF = manufacturing output; TGOVT = total government spending; GDPAG = agricultural GDP; MINTOT = import intensity of intermediate goods (imports of intermediates as a ratio of GDPMF) and DUM8588 = dummy for the period 1984/85 to 1987/88.

72. The function explains around 80% of the fluctuations in manufacturing output. Agricultural output has a very significant and large effect on manufacturing output; the short run elasticity is 0.4 while the long run elasticity is 0.8. Total government spending also has a very significant impact on manufacturing output, with a lag of one period, and a coefficient of

around 0.5. Import intensity of intermediates is significant indicating that as the import regime is more liberal and domestic producers have greater access to intermediate goods imports, there will be a positive impact on manufacturing output growth. Finally, the relaxation of industrial regulations in 1984/85 to 1987/88 as represented by a dummy variable for that period has a significant contribution to manufacturing output growth.

73. These relationships are quite robust with respect to different specifications. If the sample period is started earlier (from 1966 rather than 1971), then the coefficient of import intensity becomes more significant and the shift in the equation, captured by the dummy variable, starts in 1982/83. The effect of relaxation of capital goods imports and the effect of shifts in investment have been more difficult to measure.

C. STRUCTURE OF TRADE

74. Share of Trade. Figures 9 and 10 show the share of real imports and exports to GDP and manufacturing imports and exports to manufacturing GDP respectively. The share of imports in GDP increased up to 1980/81, partially due to the relaxation of QRs, and has continuously decreased since. The reasons for the decline have been declines in food and fuel imports, increasing tariffs up to 1986 and exchange rate adjustments thereafter. Exports, on the other hand, decreased as a proportion of GDP between 1981 and 1986 and increased after that. Similar trends are reflected in the share of manufactured goods imports and exports in manufacturing GDP.

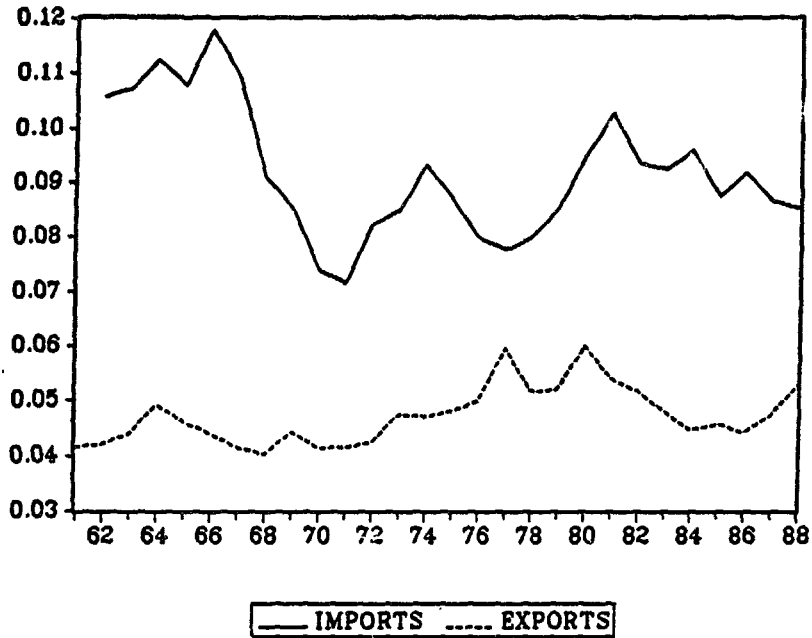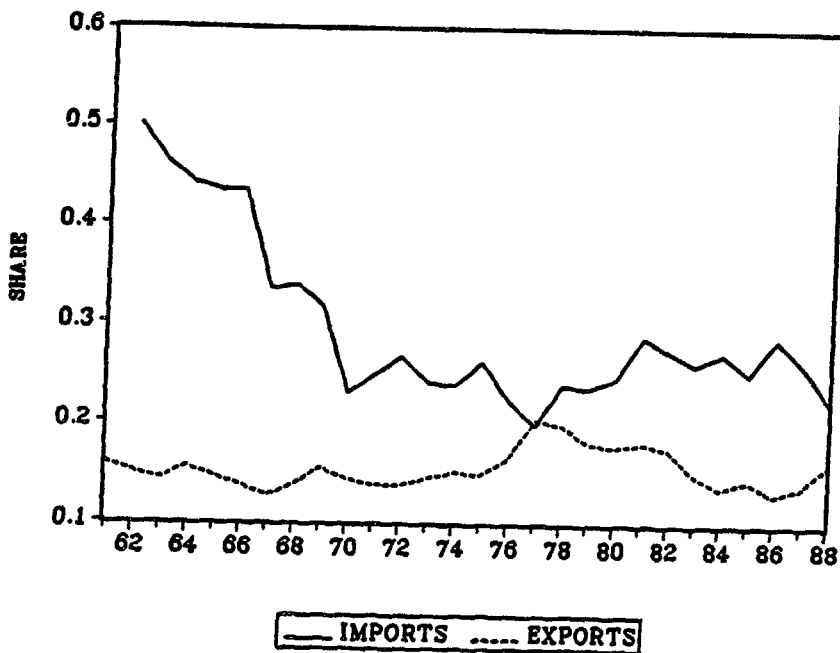# FIG. 9 TRADE TO GDP RATIOS
(1980/81 Rupees)

IMPORTS ----- EXPORTS

FIG. 10 MANUFACTURING IMPORTS AND EXPORTS TO MANUFACTURING GDP
(1980/81 Rupees)

IMPORTS ----- EXPORTS

75.   For more disaggregated import and export shares, it is not possible to derive time series data on a consistent basis. However, it is possible to obtain disaggregated shares of imports and exports in gross output for three years: (1973/74, 1978/79 and 1987/88). The data comes from the input-output tables for 1973/74 and 1978/79 while 1987/88 data is from World Bank estimates. These estimates are given in Table 6 below and are in current prices.

TABLE 6:   STRUCTURE OF TRADE

	Ratio of Imports to Gross Output			Ratio of Exports to Gross Output		
	1973/74	1978/79	1987/88	1973/74	1978/79	1987/88
AGRICULTURE	0.59	0.62	0.92	0.83	1.15	1.31
ENERGY	43.72	107.57	44.10	1.21	0.25	0.11
MINERALS	9.66	29.71	23.98	25.47	26.41	43.10
MANUFACTURING	8.37	10.16	8.94	7.12	8.66	6.76
Food, Beverages, Tobacco	1.48	6.67	2.51	7.49	9.29	6.23
Textiles Leather	0.19	0.54	0.61	13.56	11.76	13.05
Petroleum and Coal Products	31.95	13.85	6.48	6.87	1.41	4.59
Chemicals	16.76	17.83	12.14	3.18	3.09	2.72
Non-Metallic Mineral Products	4.09	19.86	28.38	1.11	24.51	34.25
Metal Products	1.03	4.14	4.41	5.66	8.12	3.15
Metals	16.69	15.50	13.97	2.90	6.92	0.99
Machinery	35.93	20.12	24.79	5.90	6.24	2.82
Electrical Appliances and Electronics	0.44	9.14	16.21	0.00	11.13	4.16
Transport Equipment	1.45	2.53	4.42	4.57	4.18	2.25
Others	7.42	14.54	10.15	9.10	9.21	3.81
TOTAL	4.22	6.87	7.17	3.55	5.10	4.99
(Total Manufacturing Excluding Gems and Petroleum Products)	7.87	9.09	8.04	7.12	7.85	5.60

Source: Data for 1973/74 and 1978/79 are from the five-year plans. 1987/88 has been estimated by World Bank from the updated input-output table.

76.   The trends in agriculture indicate marginal changes in the trade component of output. Energy consists of imports of crude oil and the changes have to do with the discovery of gas and oil in India after the 1979 oil price

shock. The share of imports to gross output in manufacturing has increased between 1973/74 and 1978/79 but has declined since then. The increase in 1978/79 can be explained by the relaxation of import controls after 1977. However, the import regime continued to be further relaxed in the 1980s. The number of items in OGL has increased substantially. Import premia on REP licenses have declined to an average of less than 10% over most of the 1980s.11/ Despite these changes, the share of imports in manufacturing output declined from about 10% to 9% between 1979 and 1988.12/ The decline in exports is even more pronounced, from 8.7% to 6.2%.

77. The disaggregated manufacturing sub-sectors indicate that the decline after 1979 is quite broad based. Only three subsectors show increases in the import ratios. These are non-metallic minerals, electrical appliances and electronics and transport equipment. In non-metallic minerals, the growth of exports and imports are due to trading in gems, which is basically imports for exports. Import ratios have declined in other non-metallic minerals such as cement. In the transport equipment subsector, the share of imports increased marginally from 2.5% to 4.6%. However, total imports in 1988 were only about US$350 million of which half were imports of ships and rail equipment. The shares of imports in shipbuilding and rail equipment increased from 12.9% and 1.6% to 55.1% and 5.8% respectively. In motor vehicles, import shares declined from 2.9% in 1979 to 2.8% in 1988. In two-wheelers, the increase in import shares was from 0.1% to 5.3% while in other transport equipment import shares actually declined from 4.8% to 0.7% of output. In electrical appliances and electronics total imports were again around US$550 million, the bulk of which is components for computers and picture tubes for TVs. In electronics including televisions, the import share actually came down from 31% to 23.5%. In electrical appliances the import share increased from 3.6%

11/ Import premia on individual products have gone up as high as 40% for short-periods of time due to delays in imports by canalizing agencies and/or temporary shortages in domestic supply.

12/ Import and export prices increased faster than domestic prices during the 1980s, especially after 1986. If the comparison is made in real terms (i.e., in 1978/79 prices), the decline from 1978/79 to 1987/88 is even larger. For total manufacturing, the share of imports in real terms declined to 8.04% in 1987/88 from 10.16% in 1978/79. Thus the decline is about 2% of gross output, a significant decline.

to 13.8%, the only sector which had a significant increase. Again, total imports in this subsector was only about US$140 million. In machinery, there is a marginal increase (again more in value terms than in real terms), but the ratio of imported to domestic machinery has not reached its 1973/74 level.

78. The situation is similar in exports. Other than gems and surplus petroleum products, the share of exports has declined across the board, indicating the lack of competitiveness of the manufacturing sector and the attractiveness of producing for the closed domestic market.

79. These developments also indicate that between 1978/79 and 1987/88, the beginning of specialization (i.e., intra-sectoral imports and exports) was reversed. This is especially true in metals, machinery, electrical appliances, motor vehicles and a host of other subsectors. In most of these industries, both import and export shares have declined, indicating that the import substitution bias of the trade regime has increased. The economy has moved away from a production pattern somewhat based on comparative advantage towards autarky.

D. CONCLUSIONS

80. These disaggregated results confirm the aggregate conclusions of the previous analysis that the changes in tariffs and other instruments have more than compensated for the relaxation in the import regime. Foreign trade has contracted relative to domestic output despite some relaxation on QRs and attempts to increase exports. The main reason for this decline has been the increase in relative prices of imports to domestic output due to increasing tariffs, large real devaluations especially after 1986, and rapidly expanding domestic demand that has increased the attractiveness of the domestic market relative to exporting.

81. Although the reforms in the policy environment have led to faster growth of manufacturing output and productivity, the main force behind this faster growth has been increases in public expenditure fueled by growing fiscal deficits. A second important variable has been more accommodating import policy sustained by large external borrowings. These results indicate that

the maintenance of this pattern of growth is not sustainable due to significant internal and external stocks of debt that have accumulated over the last decade. Therefore, significant changes in the macroeconomic and trade policy environment will be needed to shift the economy to a more export oriented path to overcome both the foreign exchange shortages and to rely more on external demand for industrial output.

82. This study also illustrates the high degree of responsiveness to relative price changes exhibited by the manufacturing sector. Despite the elasticity pessimism that pervaded Indian policy-making, the elasticities presented above are quite high, indicating that the economy would respond favorably to changes in the incentives.

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