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LIBERALISATION OF CAPITAL GOODS IMPORTS IN INDIA

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NO.8 AUGUST, 1990

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Acknowledgments

This paper is prepared under the Macroeconomic and Industrial Policy Research Programme at the NIPFP. An earlier version of the paper was presented at a Round Table discussion on "Issues Relating to Industrial and Trade Liberalisation and Export Growth" organised by the NIPFP on January 23, 1990 and at a Seminar on "International Trade and Development : Implications of Recent Theoretical Research and Experience", organised by the International Trade and Development Division, School of International Studies, Jawaharlal Nehru University, New Delhi, on February 8-10, 1990. We have benefited greatly from the comments of Prof. M. Datta-Chaudhuri, Prof. K.L. Krishna, Dr. Narhari Rao, and other participants at the Round Table and the Seminar. We are also grateful to an anonymous referee for many helpful comments and suggestions.

Abstract

The import policy for capital goods has been increasingly liberalised since the mid-1970s. The analysis presented in this paper indicates that a significant effect of the import policy liberalisation occurred only in the early 1980s. The analysis also brings out that the recent increases in capital goods imports are largely attributable to the depreciation of the Indian Rupee, and the contribution of the 1985 import policy changes was small. Regarding the effect of import liberalisation on the financial performance of the Indian capital goods manufacturers, the study comes to the conclusion that the domestic industry taken as a whole was not seriously affected by the liberalisation of import policy; at least the effect was not as alarming as is often made out.

Liberalisation of Capital Goods Imports in India

Introduction

A major achievement of our inward-looking industrialisation strategy is that India has now a large and well-diversified capital goods sector, which has enabled the country to attain a high degree of self-sufficiency in capital goods. While at the beginning of the planning era we had to depend on foreign producers for more than three-fourths of our requirements of capital goods (machinery and equipment), by the mid-1970s, indigenous production constituted about 85 per cent of the domestic availability of capital goods.

However, from 1976-77 began a gradual process of liberalisation of imports of capital goods into India. Two recent studies (Chandrasekhar 1987, and Singh and Ghosh 1988) have examined this phase of development of India's capital goods sector and come to the conclusion that the liberalisation of capital goods imports had a significant adverse effect on the domestic industry. In these studies, data have been presented to show that the share of imports in domestic availability of machinery and equipment has been on the rise since the mid-1970s. Empirical evidence has also been presented to indicate that increasing competition from abroad has adversely affected growth, production, capacity utilisation, employment and financial performance of domestic capital goods producers.

In both studies, serious concern has been expressed over the 1985 import policy, which has further liberalised imports of capital goods. Singh and Ghosh (1988) seem to hold the view that the consequences of the March 1985 import liberalisation measures would be disastrous for the domestic capital goods industry. Similar views have been expressed in several other articles published in the last four years.

The issue under discussion being a very important one, there is need for more empirical studies on it. In this paper, we examine empirically certain aspects of the liberalisation of capital goods imports in India.

Growth of Capital Goods Imports in the 1980s

India's imports of capital goods (machinery and transport equipment) for the period 1980-81 to 1988-89 are shown in Table 1. It is seen from the table that between 1980-81 and 1984-85, the value of imports of machinery and transport equipment increased from Rs.1821 crores to Rs.3027 crores, marking a growth rate of 13.5 per cent per annum. In the next two years, the value of imports more than doubled, from about Rs.3 thousand crores to over Rs.6 thousand crores. Expressed in U.S. dollars, the increase in the value of imports of capital goods was from $2546 million to $4914 million, again a rise by about 100 per cent. Between 1984-85 and 1988-89, capital goods imports increased at the rate of 22.2 per cent per annum, which was well above the growth rate of 13.5 per cent per annum recorded during the period 1980-81 to 1984-85. Expressed in U.S. dollars, the value of capital goods imports marked a growth rate of 16.3 per cent per annum between 1984-85 and 1988-89, far exceeding the growth rate of 2.5 per cent per annum between 1980-81 and 1984-85.

The figures on capital goods imports presented in Table 1 indicate that, in the two years following the import policy changes made in March 1985, there was a sharp rise in imports of capital goods. One would be tempted to treat this as a direct consequence of the liberalisation of import policy for capital goods. A closer examination reveals, however, that a large part of the observed increase in the value of capital goods imports was caused by the depreciation of the Indian Rupee vis-a-vis other currencies. This is brought out by Table 2. To make adjustments for exchange rate variations, a weighted average of the exchange rates of Indian Rupee vis-a-vis Dollar (U.S.), Pound (U.K.), Franc (France), Deutche Mark (FRG), Yen (Japan) and Won (Korea) is taken, using as weights the relative shares of these six countries in India's

imports of machinery and transport equipment (in 1984-85). Table 2 shows the index of import value of machinery and transport equipment (base 1984-85 = 100). It is interesting to note from the table that while between 1984-85 and 1986-87, imports of capital goods expressed in Indian Rupee increased by 107 per cent, the increase was only by 60 when import values are expressed in sdr, and 46 per cent when a weighted average of exchange rates are used. It is also seen that in the last case, there was a significant fall in the value of imports between 1986-87 and 1988-89. Indeed, looking at index shown at the last column of the table, it would be realised that the growth rate of the value of capital goods imports (corrected for exchange rate variations) was much smaller (4.85% per annum) in the period 1984-85 to 1988-89 than in the period 1980-81 to 1984-85 (11.06% per annum).

Expansion of OGL List for Capital Goods

In Import Policy for 1985-88, 201 items of capital goods were added to the OGL (Open General Licence) list. Several authors, writing on import policy changes made in 1985, have considered this a significant liberalisation of capital goods imports. Since there was a sharp increase in the value of capital goods imports between 1984-85 and 1986-87, it would be interesting to find out whether this act of placing a large number of capital goods items under OGL was an important cause for the increase in import value.

To answer this question, one should compare the value of imports of the capital goods items newly added to the OGL list during the period 1984-85 to 1986-87. This, however, we could not do, as data on imports were not available at sufficiently disaggregate level to make it possible to get the value of imports of the individual items of the OGL list. We therefore took an indirect approach and estimated for 1986-87 the total value of imports of all the items in the OGL list, drawing data from Statistics of India's Foreign Trade (DGCI&S, Ministry of Commerce). This proved to be a very difficult task. The method that we followed to estimate the value of imports of capital goods under OGL is briefly described below.

The OGL list included about 1000 items. For about 150 items, we could clearly identify the RITC categories at 7-digit level. This group of items is hereafter referred to as OGL group I. For about 120 items, we could find the RITC 7-digit categories, but the items included in the OGL list did not match exactly with the RITC categories. The problem was more serious for 7 items among these 120, for which it was found that the item(s) listed under OGL constituted only a part of the identified RITC category. For these 7 items, half of the reported import value for the relevant RITC category was taken as import under OGL. This group of items is hereafter referred to as OGL group II. For about 100 items, the value of imports was not reported in the data sources mentioned above, presumably because imports of such items were nil or negligible. The remaining items about 630 in all belonged mostly to "others" and "not elsewhere specified" categories of various product groups in the RITC classification. These RITC categories included many items besides the one(s) in the OGL list, so that the value of imports under OGL probably formed only a small part of the reported figures on imports. An examination of the OGL list revealed that about 300, among these remaining 630 items, were concentrated in 7 RITC categories at 7-digit level. Though, for these RITC categories, the value of imports under OGL is expected to form only a small part of the reported figure on imports, the actual proportion could not be estimated. Thus, we proceeded with the assumption that OGL imports constituted 10 per cent of the reported import value[1]. This group of items is hereafter referred to as OGL group III. We obtained our estimate of the value of capital goods imports under OGL by summing the reported import values for items belonging to OGL groups I and II (with 50% adjustment in respect of 7 items of the latter group), and adding to it 10 per cent of the reported figures on imports for the RITC categories to which the items of OGL group III belonged.

According to our estimate, the value of capital goods imports under OGL was Rs.473 crores in 1986-87. The total value of imports of capital goods[2] (defined broadly to include professional and scientific apparatus and equipment [RITC 87] and photographic and cinematographic equipment [RITC 88] along with machinery and transport equipment [RITC 7]) was Rs. 6792 crores in

that year. Thus, the estimated value of capital goods imports under OGL is found to constitute about 7 per cent of the total value of capital goods imports in 1986-87.

It is important to recognise here two limitations of the estimate of the value of capital goods imports under OGL, presented above. First, since exact matching could not be done between the OGL list and the RITC categories, some ad hoc ratios had to be applied to compute the imports under OGL. This has made the estimate crucially dependent on the ratios chosen. If, for OGL group III, the ratio is taken as 25% in place of 10%, then the estimate of capital goods imports under OGL for 1986-87 turns out to be Rs.686 crores, constituting about 10 per cent of the total value of capital goods imports for that year. Secondly, in our computation we have not included about 300 items out of the total of about 1000 items under OGL. This has caused an underestimation of the value of capital goods imports under OGL, the extent of which is difficult to ascertain.

Clearly, there may be a significant margin of error in our estimate of the value of capital goods imports under OGL. It seems to us, however, that the true proportion of capital goods imports under OGL would not be much higher than what our computations indicate. Accordingly, it may be inferred that the share of the 201 new items of the OGL list was small, probably very small, so that their placement under OGL did not contributed much to the growth of capital goods imports between 1984-85 and 1986-87[3].

Share of Imported Capital Goods

Both Chandrasekhar (1987) and Singh and Ghosh (1988) have noted in their papers that the share of imports in domestic availability of machinery and equipment increased significantly over the period 1976-77 to 1983-84. For computing the relevant ratio, they have used data on production, imports and exports of machinery and transport equipment at current prices. Since current price data have been used, the computed ratio is affected by variations in price and exchange rate, and it may not therefore correctly show

inter-temporal changes in the extent of import penetration in the capital goods sector. Keeping this in view, we have used for our analysis a deflated series on imports of machinery and transport equipment. Deflation has been done by the unit value index[4] of imports of machinery and transport equipment. Also, we have used a different ratio than the one used by Chandrasekhar, and Singh and Ghosh, namely, the ratio of real imports of capital goods to real domestic gross fixed capital formation in machinery and equipment[5].

Table 3 shows for the period 1968-69 to 1986-87 the ratio of real imports of capital goods to real gross domestic fixed capital formation in machinery and equipment (both at 1970-71 prices). A graphic presentation is made in Chart 1. From Table 3 (and the Chart) one can clearly observe a downward trend in the ratio in the period 1968-69 to 1975-76. It is interesting to note that the downward trend continued beyond the mid-1970s (despite liberalisation of import policy for capital goods), up to 1979-80. It is in the 1980s that the ratio started rising. It reached a peak in 1983-84, and then declined sharply in the following year. The ratio increased again in 1985-86 and 1986-87, but the relative share of imported capital goods remained lower than that in 1983-84. Some rough estimates made for recent years indicate that in 1988-89 the ratio was lower than its 1986-87 level (note, in Table 2, the decline in the value of capital goods imports in 1987-88 and 1988-89).

Since, for analysing import penetration, we have used the ratio of imports to domestic investment, while Chandrasekhar, and Singh and Ghosh have used the ratio of imports to availability (production minus exports plus imports), our results are not strictly comparable to theirs. Also, the trends observed in the degree of import penetration may be peculiar to the ratio chosen for the study. These considerations have led us to compute also the conventional import-availability ratios, which are shown in Table 4.

Import-availability ratios have been computed for the years 1975-76 to 1985-86, at both current and constant prices. Data on domestic production have been drawn from Annual Survey of Industries (ASI). Data on imports and

exports have been drawn from Statistical Abstract : India (CSO) and Monthly Statistics of Foreign Trade of India (DGCI&S, Ministry of Commerce). For computing import-availability ratio at constant prices, the series on domestic production has been deflated by the wholesale price index of machinery and transport equipment, and the series on exports and imports have been deflated by the corresponding unit value indices.

It is interesting to note from Table 4 that the import-availability ratio at current prices does not show any significant upward or downward trend in the period 1975-76 to 1985-86. The ratio remains in the range of 14 to 18 per cent. Between the two end points, the ratio increases marginally from 17.04 per cent to 17.76 per cent. In the study of Chandrasekhar (1987), on the other hand, a significant increase was found in the import-availability ratio, from 20.96 per cent in 1976-77 to 26.65 per cent in 1983-84. The difference in the results of the two studies in regard to the trend in import-availability ratio is primarily attributable to the data sources used for domestic production of capital goods. Chandrasekhar has used production data of DGTD (Directorate General of Technical Development) while we have used production data of ASI. The coverage of DGTD is smaller than that of ASI, with the result that production figures reported by DGTD are much lower than those reported in ASI. A comparison of output figures obtained from the two sources is presented below:

	Value of Production in 1983-83 (Rs. Crore)	
	DGTD	ASI
Non-Electrical machinery	3197	5346
Electrical machinery	2644	4725
Transport equipment	2277	5007
Total	8118	15078

The output figures reported in ASI, we feel, represent more correctly the level of domestic production activity than the figures reported by DGTD, and therefore the import-availability ratios computed using ASI data are more reliable.

Import-availability ratio at constant prices shows a pattern very similar to that observed for the ratio of real imports of capital goods to real gross domestic fixed capital formation in machinery and equipment, analysed earlier. A downward trend is seen in the import-availability ratio for the years 1975-76 to 1979-80, and a reversal of trend occurs in the early 1980s. A peak is reached in 1983-84, and then the import-availability ratio starts declining.

The two main points emerging from the above analysis are as follows:

(i) Chandrasekhar (1987) and Singh and Ghosh (1988) have found a significant increase in import-availability ratio (at current prices) of capital goods from the mid-1970s. Similar computations made by us do not show any such clear upward trend. This difference in findings is traceable mainly to the sources of data used for domestic production. Chandrasekhar, and Singh and Ghosh[6] have used output data of DGTD, while we have used ASI data (which we believe represents more correctly the level of domestic production activity).

(ii) Our analysis based on import-availability ratio at constant prices, and the ratio of real imports of capital goods to real gross domestic fixed capital formation in machinery and equipment indicates that dependence on imports continued to decline beyond the mid-1970s, and it is only in the early 1980s that the dependence on imports began to rise. But, this upward trend did not sustain beyond 1983-84.

Changes in Tariff Rate

Table 5 shows, for different years from 1968-69 to 1988-89, the average realised (or effective) tariff rate on imports of machinery and transport equipment.[7] A graphic presentation is made in Chart 2. To compute the tariff rate, we have divided customs duty collections on imports of machinery and equipment by the c.i.f. value of imports. Although the average realised tariff rate is affected by changes in the product composition of imports, an analysis of its trend is useful for judging how the overall structure of customs duties have changed over time.

From Table 5, it is seen that there was an appreciable and more or less steady increase in the average realised tariff rate on imported capital goods in the late 1960s, in the 1970s and in the early 1980s. The average tariff rate was 20.9 per cent in 1968-69. It increased to 26.1 per cent in 1970-71, 45.2 per cent in 1976-77, 61.8 per cent in 1981-82, and further to 75.1 per cent in 1984-85. It would appear therefore that the advantage to foreign producers provided by the liberalisation of import policy for capital goods was partly offset by the hikes in the effective tariff rate.

After 1984-85, there was a fall in the average realised tariff rate. It fell from 75.1 per cent in 1984-85 to 61.0 per cent in 1985-86, and 59.8 per cent in 1986-87. The tariff rates in 1987-88 and 1988-89 were 65.2 and 62.8 per cent which were marginally higher than the rate in 1986-87, but lower than the rate in 1984-85.[8]

In the computations of average realised tariff rate presented in Table 5, machinery has been combined with transport equipment. Tariff rates on imports of machinery are shown separately in Table 6. It is seen from the table that the tariff rate on machinery imports increased from 20.3 per cent in 1968-69 to 77.5 per cent in 1982-83 and 77.6 per cent in 1984-85. The tariff rate fell to 61.8 per cent in 1985-86 and 61.5 per cent in 1986-87. It was marginally higher in the next two years, but lower than the rate prevailing in 1984-85.

It will not be out of place to give here a brief account of important changes made in import duties in the last few years. In the Budget for 1985-86, the rate of import duty (basic plus auxiliary) on general projects was reduced from 65 per cent to 45 per cent. For power projects and fertilizer projects, the rate of import duty was brought down to 25 per cent and zero per cent respectively. Significant reduction in import duties (from 81.5 to 35 per cent) were also made for specified machinery for leather and leather products industry. For the benefit of the computer industry, import duty was reduced from 75 to 25 per cent for four important components of computers. Also, advanced computers were exempted from customs duty. The observed reduction in the average realised tariff rate in 1985-86 reflects in part these changes in tariff rates.

In 1986-87, the general machinery import duty rate was raised by 10 per cent. Similarly, the import duty rate on general projects was raised from 45 to 55 per cent. But, the duty rate on components was reduced by 5 per cent (to raise effective protection to domestic manufacture of capital goods). For 32 items of machine tools in which domestic production was established the duty rate was raised to 110 per cent, while for 91 items of machine tools in which there was negligible domestic production the rate of duty was reduced to 55 per cent.

In 1987-88, the rate of import duty on general projects was raised significantly from 55 to 85 per cent (i.e. to a level higher than that prevailing in 1984-85). On fertilizer projects, the import duty rate was raised from nil to 15 per cent and on electronics projects from 25 to 30 per cent. For power projects up to 50 MW capacity the duty rate was raised from 25 to 35 per cent. On the other hand, the general machinery rate of import duty was reduced from 101 per cent to 85 per cent. Thus, the general machinery and general project rates of import duty were equalised (to encourage modernisation of existing plants). Duty concessions on specified machinery were made for foundries and caustic soda plants based on mercury-cell. Also, import duty on special steel (an important material for machine manufacture) was reduced to 85 per cent to help domestic capital goods producers.

In 1988-89, duty concessions on specified machinery were made for several industries, including food processing, electronics, manufacture of watches, and roller bearing. For computer industry, the rates of import duty on different items were made more uniform.

In the Budget for 1989-90, the general machinery and general project rate of import duty was reduced from 90 to 80 per cent. The rates of import duty on components were also reduced by 10 per cent. Import duty on electronics projects was raised by 10 per cent, while that on power projects was raised by 5 per cent. In a large number of specified capital goods and components, concessional duty rates were prevailing in 1988-89. These rates were revised upward significantly. As a result of these changes, there was a reduction in the extent of variation in the rates of import duty on different capital goods.

To summarize, import duties were reduced significantly in 1985-86. In subsequent years, import duties were lowered for some items of machinery and equipment but raised for some others. Therefore, the average rate probably did not change much in these years.

Import Function for Capital Goods

Imports of capital goods depend on the tariff rate on capital goods, and also on the prices of capital goods prevailing in domestic and international markets, the exchange rate and the investment rate in the economy. To study the influence of all these factors on imports of capital goods (machinery and transport equipment) in India, we have estimated an import function, using time-series data for the period 1968-69 to 1986-87.

For estimating the import function the following specification has been used:

$$\ln M = a + b_1 \ln I + b_2 \ln RP + b_3 D + b_4 t + u$$

where M is the quantity index of capital goods imports, I is the rate of investment (real) in machinery and equipment in the economy, RP is the price ratio (tariff adjusted) of imported to domestic capital goods, and u is the random error term. D is a dummy variable, taking value unity for years 1977-78 to 1986-87 and zero for years 1968-69 to 1976-77. It is included in the equation to capture the effect of the liberalisation of import policy for capital goods which took place in the period after the mid-1970s. A trend variable t is included in the equation to pick up the influences of excluded variables (to the extent possible).

The relative price variable RP is defined as:

$$RP = p_w (1+r) / p_d$$

where p_w is the price index of imported capital goods, p_d is the price index of domestic capital goods and r is the tariff rate. Clearly, p_w depends on the price prevailing in international markets and the exchange rate(s).

The data sources used for the estimation of the import function may be mentioned briefly. The quantity index of imports of capital goods (machinery and transport equipment, RITC 7) and the corresponding price (unit value) index have been taken from Statistical Abstract, India (CSO) and Monthly Abstract of Statistics (CSO). For the domestic price variable, we have used the wholesale price index for machinery and transport equipment, taken from Index Number of Wholesale Prices in India (Office of the Economic Advisor, Ministry of Industry). Series on real gross domestic fixed capital formation in machinery and equipment has been taken from National Accounts Statistics (CSO). For variable r, we use the average realised tariff rate on machinery and transport equipment[9], computed by us and shown in Table 4.

The estimated import function is shown below (t-values are in parentheses):

$$\ln M = -7.94 + 2.842 \ln I - 0.994 \ln RP + 0.118 D - 0.138 t$$
$$\qquad\qquad (4.30) \qquad (-6.69) \qquad\quad (1.07) \quad (-2.62)$$

$$n = 19 \qquad R^2 = 0.957 \qquad F = 78.3 \qquad DW = 1.34$$

The coefficients of the investment variable I and the relative price variable RP are correctly signed and statistically significant at one per cent level. The value of R^2 for the equation is 0.957, which indicates that the estimated model gives a good fit to the data. However, it is seen that the coefficient of the dummy variable is statistically insignificant (though it has the expected positive sign). Thus, the regression results do not lend empirical support to the view that, in the period after 1976-77, liberalisation of import policy for capital goods caused significant increases in capital goods imports.

Our finding of a statistically insignificant coefficient for the dummy variable raises doubts about the appropriateness of taking 1977-78 as the year from which the effects of import policy liberalisation began to be felt significantly. It would be recalled in this connection that a downward trend in the ratio of capital goods imports to gross domestic capital formation in machinery and equipment, observed from the period 1968-69 to 1975-76, continued beyond the mid-1970s, and a reversal of trend occurred only in 1980-81. Further, a study of the import policy documents for different years of the 1970s, brings out that while some changes in import policy were initiated from the mid-1970s, more important changes were made in the late 1970s, the effects of which might have been felt from 1980-81 onwards. These considerations have led us to re-estimate the equation, replacing the dummy variable D by another one D*, which takes value zero for years 1968-69 to 1979-80 and one for subsequent years. The results are found to be better[10], and it is this equation that we use for further interpretation and analysis. The estimated equation is shown below (t-values are in parentheses):

$$\ln M = -6.56 + 2.764 \ln I - 0.655 \ln RP + 0.318 D^* - 0.150 t$$
$$\qquad\qquad (5.01) \qquad (-3.73) \qquad (2.63) \quad (-3.43)$$

$$n = 19 \qquad R^2 = 0.969 \qquad F = 109.4 \qquad DW = 2.00$$

In the re-estimated regression equation, the coefficient of the dummy variable D* is positive and statistically significant at five per cent level. Thus, some empirical support is found for the hypothesis that a more liberal import policy resulted in higher imports of capital goods in the 1980s. Turning to other coefficients, it is seen that the coefficients of the investment variable I and the relative price variable RP are both statistically significant at one per cent level. The signs of the two coefficients are correct, and the numerical values plausible. Our results suggest a less than unitary price elasticity of import demand for capital goods. As the coefficient of the investment variable is well above one, it may be inferred that an increase in the investment rate in the economy tends to raise imports of capital goods more than proportionately. Since the function has been estimated from time-series data and a trend variable has been included, the estimated coefficient of I probably reflects the short-term impact. Clearly, in the short run, such a relationship between domestic investment activity and imports of machinery and equipment is not implausible.

The coefficient of the trend variable is negative, and statistically significant at one per cent level. As mentioned earlier, this variable is included in the equation to pick up the influences of excluded variables. It would be realised that the process of learning by doing, inflow of foreign technology (and investment), acquiring of technological capabilities, and creation of manufacturing facilities for sophisticated equipment in the country must have had a significant depressing effect on our capital goods imports. The finding of a negative coefficient for the trend variable probably reflects these influences.

The value of R^2 for the regression equation is 0.969, which indicates that the estimated model gives a good fit to the data. This is also borne out by Chart 3 in which actual and estimated values of the dependent variable are shown. It should be noted further that the estimated import function predicts the turning points quite well.

The analysis presented above indicates that there was a significant upward shift of the import function in the 1980s. To test for shifts of the function, dummy variables were used. The CUSUM test[11] provides an alternative method for detecting departures from constancy of regression relationships over time. We have also applied this test to study the stability of the estimated import function. The plot of the recursive residuals (on which the CUSUM test is based) is given in Chart 4. The plot indicates a structural break in the import function around 1980. This corroborates our finding based on the dummy variable method.

Performance of Engineering Companies

To supplement the analysis presented thus far, we examine next the performance of 25 selected engineering companies (15 general engineering and 10 electrical engineering companies) over the period 1970 to 1988. Two ratios are considered for the analysis, namely (i) rate of return on capital employed, and (ii) turnover ratio (net sales to total assets). The data are drawn from the Official Stock Exchange Directory, Bombay. The companies chosen for the analysis are such that the two ratios are available from the data source for most years of the period under analysis. In making the choice we have also taken into account the production structure of different companies so that we get a sample of companies well-diversified in terms of goods produced.

Tables 7 and 8 present the two ratios for the selected companies for the years 1970 to 1988. Simple averages for general and electrical engineering companies are also shown in the table. As seen from the table, generally the selected engineering companies did not experience any decline in the rate of

return on capital employed or the turnover ratio after the mid-1970s or even after the mid-1980s. The average ratios do not show any marked downward trend.

To test statistically whether there was a significant downward trend in the two ratios, trend lines have been fitted by OLS for each company separately. A significant negative coefficient of the trend variable is found in one case out of 25 for the rate of return on capital employed and in 4 cases out of 25 for the turnover ratio.

We have carried out a similar exercise for a larger number of companies, 30 general engineering and 20 electrical engineering, for a shorter period 1979 to 1986. It would be recollected that during this period there was a rapid growth of capital goods imports in India and the ratio of imported capital goods to gross domestic capital formation in machinery and equipment nearly doubled. Rate of return on capital and turnover ratio for the 50 sample companies for different years from 1979 to 1986 are shown in Tables 9 and 10. The average ratios shown in the table for general and electrical engineering groups do not exhibit any sharp decline over the period. Also looking at the performance of individual companies, a significant downward trend in the ratios is observed in only a small proportion of cases.

It may be concluded on the basis of these results that most of the sample companies have not been affected much by the liberalisation of import policy for capital goods. But, from this analysis, no general inference can be drawn about the effect of import liberalisation of capital goods on the domestic industry, because our sample, being based on Bombay Stock Exchange Official Directory, includes only private sector companies (some of which may be subsidiaries of foreign capital goods manufacturing companies and thus gaining from greater import penetration), while public sector units account for a major share of finished capital goods production in the country. It is therefore necessary to take a look also at the performance of public sector engineering units.

For 17 public sector enterprises manufacturing capital goods, Table 11 shows gross sales, capital employed, the ratio of gross profit to capital employed and the ratio of gross sales to capital in the years 1975-76 through 1988-89. It is seen from the table that many of these enterprises experienced a rapid growth in sales. What is more important to note from the table is that there did not occur in general a significant deterioration in the ratio of gross profits to capital employed (profitability ratio) and the ratio of gross sales to capital employed (turnover ratio). Thus, the liberalisation of import policy for capital goods does not seem to have seriously affected the performance of public sector engineering units selected for the study.

Table 12 shows the rates of return on invested capital earned by the non-electrical and electrical machinery industries during the period 1978-79 to 1985-86, based on factory sector results of ASI. It is interesting to note that there is no significant downward trend in the rate of return, rather there is a mild upward trend. Thus, even at the aggregate level, we do not find any significant adverse effect of import liberalisation on the profitability performance of the machine-building industry.

Concluding Remarks

The import policy for capital goods has been increasingly liberalised since the mid-1970s. The analysis presented in this paper indicates that a significant effect of the import policy liberalisation on imports of capital goods occurred only in the early 1980s. As regards the recent changes in import policy for capital goods, it seems that these did not contribute much to increases in capital goods imports. Our analysis reveals that a large part of the recent increases in capital goods imports is attributable to the depreciation of the Indian Rupee vis-a-vis foreign currencies. Although our dependence on imported capital goods increased sharply between 1979-80 and 1983-84, there has been a downward trend in this ratio in the years after 1983-84.

One aspect which received particular attention in the study is the effect of import liberalisation on financial performance of Indian capital goods manufacturers. Our analysis brings us to the conclusion the the domestic capital goods industry taken as a whole was not seriously affected by the liberalisation of import policy (though for certain types of capital goods demand problems might have arisen due to increases in imports); at least the effect was not as alarming as is often made out.

The average tariff rate on capital goods has more or less steadily increased since the late 1960s. Though there has been some decline after 1984-85, the average tariff rate in recent years has been much higher than the rates prevailing in the late 1960s and the early 1970s.

The tariff rate on capital goods in India is quite high in comparison with the rates obtaining in many other developing countries (see Table 13). At present the general machinery and general project rate of import duty is 80 per cent (though the average rate of import duty (basic plus auxiliary) for all capital goods imports is in the range of 40 to 50 per cent). Thus, even before a newly established factory based on imported machinery and equipment starts working, an Indian entrepreneur has much higher capital cost than his counterparts in other developing countries. That his products will be high cost and his competitiveness in international markets low, is therefore not surprising.

On this ground, a case can be made out for reducing import duties on capital goods, but one must also ensure that the domestic manufactures receive adequate protection (especially for those product lines in which domestic production is socially much more beneficial than imports). It is remarkable that despite high import duties on capital goods , the effective rates of protection have been found in studies to be low or negative for several items of capital goods. This is obviously due to high tariff on raw materials, components and parts used in the manufacture of capital goods. Evidently, by proper structuring of customs duties, it should be possible to have both lower import duty on machinery and adequate protection to domestic producers.

TABLE 1

Imports of Machinery and Transport Equipment in the 1980s

Year	Value of imports		Rate of change over the previous year (%)	
	(Rs crore)	(US $ million)	based on (2)	based on (3)
1980-81	1821	2303	-	-
1981-82	1980	2208	8.7	-4.1
1982-83	2573	2662	29.9	20.6
1983-84	3173	3069	23.3	15.3
1984-85	3027	2546	-4.6	-17.0
1985-86	4084	3338	34.9	31.1
1986-87	6279	4914	53.7	47.2
1987-88	6108	4711	-2.7	-4.1
1988-89	6745	4658	10.4	-1.1

Note: Value of imports (in Rs.) are taken from Statistical Abstract, India (CSO) for the years 1980-81 to 1985-86. For subsequent years, data are drawn from Economic Survey, 1989-90, Government of India.

TABLE 2

Index of Import Value of Machinery & Transport Equipment, 1980-81 to 1988-89

1984-85 = 100

year	Import value in Rs	Import value in $	Import value in sdr	Import value in weighted average of exchange rates
1980-81	60.16	90.44	70.53	65.72
1981-82	65.41	86.72	75.53	72.20
1982-83	85.00	104.55	96.03	93.45
1983-84	104.82	120.53	114.33	111.75
1984-85	100.00	100.00	100.00	100.00
1985-86	134.92	131.10	124.58	121.55
1986-87	207.43	193.00	160.24	146.44
1987-88	201.78	185.02	140.64	124.99
1988-89	222.83	182.93	138.04	120.84

Note: For computing the last column a weighted average of exchange rates of Indian Rupee vis-a-vis Dollar, Pound, Franc, Mark, Yen and Won has been taken, using weights based on imports from those countries in 1984-85.

TABLE 3

Share of Imports in Gross Domestic Fixed Capital Formation (GDFCF) in Machinery and Equipment (at 1970-71 Prices)

(Values are in Rs. crore)

Year	GDFCF	Imports	Share of imports (column 3) in GDFCF (column 2)
1	2	3	4
1968-69	2230	566.82	25.42
1969-70	2370	340.64	14.37
1970-71	2346	395.00	16.84
1971-72	2711	491.93	18.15
1972-73	2848	471.77	16.57
1973-74	3357	514.14	15.32
1974-75	3286	396.10	12.05
1975-76	3369	418.52	12.42
1976-77	3835	424.62	11.07
1977-78	4105	511.52	12.46
1978-79	4429	448.99	10.14
1979-80	4561	406.26	8.91
1980-81	4900	675.40	13.78
1981-82	5426	849.40	15.65
1982-83	6146	1065.28	17.33
1983-84	6631	1486.55	22.42
1984-85	6942	988.80	14.24
1985-86	7733	1222.28	15.81
1986-87	8884	1510.61	17.00

Source: Government of India, Central Statiscal Organisation (CSO): National Accounts Statistics

Figures on imports are drawn from the CSO: Statistical Abstract, India, deflated by the Unit Value Index, Imports.

Table 4

Domestic Production, Exports and Imports of Machinery and Transport Equipment (Capital Goods)

(values in Rs. lakhs)

Year	Domestic Production			Exports	Imports	Import-availability ratio at	
	Machinery (NE)	Machinery (E)	Transport Equipment			current prices	constant prices
1975-76	169210	167744	143694	25639	93458	17.04	13.72
1976-77	201501	191800	164106	29407	97914	15.64	11.31
1977-78	219086	209965	170285	38538	111038	16.41	13.36
1978-79	248584	235077	212632	39650	125990	16.10	11.18
1979-80	296649	298013	277857	44735	136781	14.18	9.51
1980-81	358590	361923	336892	52546	182075	15.34	14.04
1981-82	425768	391835	424076	61735	198065	14.37	16.52
1982-83	480994	474065	476422	57933	257263	15.78	18.73
1983-84	534613	472518	500683	52712	317354	17.90	22.93
1984-85	594186	556201	583182	65509	302708	15.36	15.36
1985-86	689066	632948	636496	67668	408395	17.76	18.15

Note: Machinery(Non-Electrical)+Machinery(electrical)+Transport equipment -Exports+Imports = Total availability of Capital goods in the economy
Value of Output is deflated by Wholesale Price indices for Machinery & Transport Equipments. Exports and Imports values have been deflated by unit value Indicies of the Items under the RITC 7.

Source : Govt. of India, Central Statistical Organisation(CSO) Annual Survey of Industries, Factory sector, summary results

Govt. of India, CSO Statistical Abstract: India

Govt. of India, DGCIS Monthly statistics of Foreign Trade of India

TABLE 5

Average Realised Tariff Rate on Imports of Machinery and Transport Equipment

(values are in Rs. crore)

Year	Value of imports (CIF)	Customs duty collected	Average realised tariff rate (per cent)
1968-69	603	126	20.90
1969-70	395	100	25.32
1970-71	395	103	26.08
1971-72	471	147	31.21
1972-73	532	182	34.21
1973-74	629	235	37.36
1974-75	670	258	38.50
1975-76	935	341	36.47
1976-77	1048	474	45.23
1977-78	1121	443	39.52
1978-79	1261	534	42.35
1979-80	1383	748	54.09
1980-81	1821	894	49.09
1981-82	1980	1223	61.76
1982-83	2573	1667	64.79
1983-84	3173	1904	60.01
1984-85	3027	2274	75.12
1985-86	4084	2491	60.99
1986-87	6279	3754	59.79
1987-88	6108	3984	65.23
1988-89	6745	4241	62.88

Source: Government of India, Central Statistical Organisation (CSO): Statistical Abstract, India. For the last two years, data on imports are drawn from Government of India, Ministry of Finance, Economic Survey. Data on customs duty collected are drawn from Government of India, Ministry of Finance, Receipts Budget.

TABLE 6

Average Realised Tariff Rate on Imports of Machinery

(Rs crore)

Year	Value of Imports (CIF)	Customs Duty Collected	Average Realised Tariff Rate(Per cent)
1968-69	538	109	20.26
1969-70	344	90	26.16
1970-71	328	88	26.83
1971-72	376	119	31.65
1972-73	432	145	33.56
1973-74	541	194	35.86
1974-75	547	208	38.03
1975-76	778	272	34.96
1976-77	877	384	43.79
1977-78	896	392	43.75
1978-79	964	478	49.59
1979-80	1046	653	62.43
1980-81	1349	790	58.56
1981-82	1675	1095	65.37
1982-83	1934	1498	77.46
1983-84	2726	1729	63.43
1984-85	2658	2062	77.58
1985-86	3515	2173	61.82
1986-87	5475	3369	61.53
1987-88	5367	3655	68.10
1988-89	5978	3842	64.27

Source : Same as in Table 5

TABLE 7

Rate of Return on Capital Employed

Sl No Name/ Particulars	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
GENERAL ENGINEERING																			
1 S L & Hacklal Industries	10.59	12.82	14.00	16.32	10.57	11.50	11.22	11.69	10.92	12.39	15.84	13.90	13.10	13.43	10.51	3.29	0.17	6.29	6.26
2 Triveni Engineering Works	13.67	18.43	9.33	8.10	26.57	17.37	18.62	10.10	12.57	13.89	14.84	NA	[illegible]	16.75	15.93	18.23	14.40	13.85	16.84
3 Premier Automobiles	5.58	5.30	9.81	3.92	4.86	6.59	6.93	10.79	5.66	10.65	1.28	41.86	31.09	17.24	16.34	11.56	16.37	13.41	14.03
4 Wilis(India)	16.39	22.62	29.98	14.55	12.51	13.58	13.39	14.48	16.51	18.38	17.56	20.16	18.38	17.07	11.90	14.35	15.89	14.47	NA
5 Walchand Nagar Industries	-5.23	4.56	6.23	9.73	6.83	7.80	7.98	4.47	11.52	15.05	8.20	14.42	10.76	NA	9.45	6.76	-2.98	10.92	NA
6 TexMaco	4.62	4.28	6.24	7.62	7.77	9.56	12.10	8.24	8.43	10.16	14.27	14.50	13.21	7.71	4.43	1.25	8.23	9.32	NA
7 Voltas	9.13	11.39	23.40	11.91	14.04	14.47	12.90	11.40	12.52	14.28	18.14	17.94	17.13	16.79	13.88	13.41	13.41	17.29	19.19
8 Atlas Copco(India)	15.94	21.42	16.79	14.79	20.67	19.15	17.65	16.70	14.04	14.44	18.79	21.74	19.87	13.44	15.12	14.34	13.66	14.41	NA
9 Lakshmi Machine Works	14.60	12.80	12.29	7.25	6.18	9.06	9.29	6.97	13.24	13.97	16.81	19.16	25.68	17.68	15.48	14.40	15.03	16.04	NA
10 Sandvik Asia	11.08	18.96	18.16	16.72	18.62	16.95	16.56	11.91	14.94	13.86	13.89	16.40	21.77	16.86	7.90	14.34	16.41	22.12	NA
11 Elecon Engineering	8.57	5.30	8.73	9.98	16.25	15.47	4.45	13.28	18.57	13.71	18.03	21.21	18.51	21.28	16.41	17.31	19.05	16.16	NA
12 Larsen Toubro	11.79	18.23	13.43	14.57	13.08	16.83	18.13	18.64	15.80	16.92	16.54	15.01	15.87	15.84	14.29	13.02	10.98	10.43	16.29
13 Usha Telehoist	25.70	21.92	9.50	6.13	10.54	14.90	15.09	17.26	18.09	19.73	20.87	NA	22.13	18.95	14.38	9.72	11.56	-4.76	13.87
14 Kirloskar Brothers	8.47	6.97	6.60	9.51	12.90	13.61	14.08	7.25	14.67	15.14	14.44	16.31	16.34	15.62	13.34	15.87	19.16	20.32	18.43
15 Kunal Engineering	6.92	11.98	15.84	28.92	9.94	15.29	10.60	12.96	15.48	10.78	21.15	17.78	20.06	7.56	5.83	5.91	4.07	3.10	8.53
Average	10.52	13.13	12.76	12.00	12.36	13.48	12.73	11.82	13.54	14.22	15.44	NC	18.60	NC	12.35	11.58	11.69	12.22	NC
ELECTRICAL ENGINEERING																			
1 Bajaj Electricals	13.00	16.02	15.16	13.79	14.38	13.69	8.41	-11.74	18.57	27.67	25.72	47.85	40.22	35.87	43.54	32.69	27.76	19.83	26.60
2 Bharat Bijlee	7.22	10.70	23.35	9.57	8.63	11.53	11.60	12.80	11.95	10.03	12.44	16.09	17.51	6.57	12.51	16.37	16.18	11.68	-7.88
3 Crompton Greaves	13.37	12.11	9.50	14.04	15.17	16.44	15.71	12.52	17.43	20.84	21.54	21.58	19.59	13.64	12.33	9.47	11.84	13.91	14.57
4 Siemens	15.57	14.75	14.82	12.27	16.74	18.03	17.82	12.05	9.76	15.03	16.91	17.74	19.36	17.26	12.77	9.23	12.28	14.63	10.55
5 Hindustan Brown Boveri	4.54	7.25	9.48	10.85	14.46	11.31	14.19	14.09	16.05	15.43	15.55	17.81	15.97	8.69	14.84	14.65	15.04	13.61	15.98
6 General Electric Co	4.66	8.38	9.68	6.17	5.54	15.23	11.66	10.79	10.09	10.36	7.37	10.10	14.26	14.11	10.61	11.43	13.52	11.73	13.52
7 Jyoti Electric Motors	13.68	7.16	6.20	NA	11.92	11.78	8.27	5.12	-1.19	15.77	24.27	15.60	18.37	9.76	6.43	13.57	9.22	8.75	9.61
8 American Refrigerator	4.00	2.58	9.13	10.17	9.49	6.80	6.20	13.15	8.47	-24.31	2.45	0.96	13.00	12.99	15.89	-14.79	12.94	12.83	NA
9 National Radio Electronics	NA	NA	NA	10.79	8.93	18.41	8.75	0.47	11.73	6.80	13.12	0.94	30.15	21.39	23.49	15.20	12.70	15.21	16.57
10 Permanent Magnets	NA	NA	NA	13.29	10.87	9.27	11.42	16.14	16.66	13.93	NA	25.30	15.77	[illegible]	-13.72	10.20	5.63	5.70	7.50
Average	NC	NC	NC	NC	11.62	13.27	11.40	8.54	11.95	11.36	NC	17.40	20.42	15.64	16.53	11.80	13.71	12.79	NC

Source: Official Stock Exchange Directory, Bombay

NA not available
NC not computed (because figures are not available for all the firms)

TABLE 8

Turnover Ratio
Net Sales to Total Assets

Sl.No	Name/ Particulars	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
GENERAL ENGINEERING																				
1	S L N Metkal Industries	0.62	0.43	0.97	0.95	0.71	0.78	0.82	0.04	0.93	0.93	1.01	0.91	0.90	0.00	0.94	0.62	0.62	0.67	0.83
2	Triveni Engineering Works	0.90	1.63	1.43	1.79	1.62	1.47	1.23	1.16	0.01	0.91	0.99	NA	0.96	0.07	1.06	1.56	1.00	1.02	0.81
3	Premier Automobiles	0.96	1.11	1.15	1.10	1.27	1.46	1.23	1.47	1.03	1.03	1.35	2.05	1.90	1.57	1.51	0.70	0.70	0.03	1.10
4	Midia(India)	0.64	0.70	0.71	0.66	0.73	0.93	0.93	1.20	0.98	1.24	1.02	1.25	1.06	0.77	0.01	0.91	0.03	0.79	NA
5	Walchand Nagar Industries	0.60	0.62	0.84	0.83	0.80	0.81	0.78	0.62	0.68	0.92	1.08	1.00	0.92	NA	0.91	0.88	0.66	0.92	NA
6	TexMaco	0.71	0.60	0.90	0.71	0.72	0.75	1.19	1.05	0.85	0.97	1.19	1.28	1.14	0.85	0.63	0.38	0.42	0.54	NA
7	Voltas	1.02	1.80	2.39	2.14	2.08	1.91	2.08	2.06	2.17	1.99	1.98	2.12	1.84	1.72	1.67	1.30	1.39	1.64	1.79
8	Atlas Copco(India)	1.02	1.92	1.83	1.66	1.71	1.63	1.77	1.71	1.60	1.72	1.62	1.67	1.47	1.33	1.33	1.49	1.23	0.92	NA
9	Lakshmi Machine Works	0.60	0.54	0.57	0.51	0.74	0.82	1.16	0.79	1.19	1.18	1.12	1.11	0.99	1.24	1.59	1.49	1.40	1.42	NA
10	Sasdvik Asia	0.66	1.01	0.96	0.95	1.20	1.36	1.14	0.05	0.98	0.84	1.00	1.40	1.36	1.32	0.63	1.31	1.34	1.27	NA
11	Elecon Engineering	0.70	0.81	0.87	0.85	0.94	1.49	0.75	0.83	0.67	0.75	0.64	0.66	0.78	1.03	0.03	0.85	0.80	1.00	NA
12	Larsen Toubro	0.81	0.93	0.90	1.00	0.90	1.08	1.20	1.19	1.00	1.18	1.16	1.20	0.05	0.94	0.78	0.65	0.64	0.59	0.99
13	Esha Telehoist	0.72	0.70	0.55	0.59	0.59	0.88	0.94	1.16	1.01	1.13	1.32	NA	1.04	0.07	0.00	0.64	0.67	0.58	0.75
14	Kirloskar Brothers	1.17	0.87	0.87	1.24	1.18	1.51	1.34	1.17	1.32	1.22	1.44	1.38	1.23	1.25	1.30	1.20	1.55	1.63	1.66
15	Kanal Engineering	0.47	0.78	0.65	1.70	0.88	1.08	0.85	1.14	1.07	0.62	0.80	0.98	0.61	0.39	0.41	0.36	0.38	0.39	0.44
	Average	0.09	0.99	1.04	1.11	1.08	1.19	1.16	1.15	1.09	1.11	1.18	NC	1.14	NC	1.01	0.96	0.92	0.95	NC
ELECTRICAL ENGINEERING																				
1	Bajaj Electricals	1.79	1.65	1.53	1.70	1.44	1.41	1.25	1.56	1.62	1.72	1.69	2.16	1.91	1.89	1.80	1.58	1.61	1.69	1.76
2	Bharat Bijlee	0.69	0.74	1.03	1.03	1.07	0.85	1.16	1.26	1.14	1.48	1.48	1.50	1.32	1.18	1.63	1.52	1.60	1.42	1.39
3	Crompton Greaves	1.21	1.49	1.22	1.47	1.46	1.41	1.65	1.65	1.78	1.71	1.81	1.57	1.51	1.42	1.33	1.08	1.19	1.24	1.32
4	Siemens	1.14	1.34	1.59	1.61	1.47	1.62	1.73	1.62	1.62	1.60	1.58	1.13	1.18	1.20	1.20	1.07	1.10	1.00	1.02
5	Hindustan Brown Boveri	0.95	1.08	1.02	1.04	1.07	1.03	1.23	1.30	1.25	1.14	1.08	1.03	1.02	0.05	0.89	1.18	1.13	1.20	1.21
6	General Electric Co	0.76	0.97	1.42	1.28	1.04	1.26	1.21	1.69	1.73	NA	NA	NA	1.10	1.13	1.07	1.04	1.13	1.13	1.14
7	Jyoti Electric Motors	0.94	0.68	1.23	NA	1.20	1.13	0.72	1.45	1.10	2.27	2.35	2.16	1.62	0.90	0.83	0.81	0.85	0.91	0.97
8	American Refrigerator	0.92	1.06	1.09	1.07	1.13	0.95	0.97	1.06	1.05	0.86	0.94	0.64	0.96	0.82	0.92	1.42	1.06	1.06	NA
9	National Radio Electronics	NA	NA	NA	0.93	1.24	1.34	1.04	1.08	1.15	1.23	1.21	1.41	1.56	1.37	1.27	1.57	1.22	1.12	1.28
10	Permanent Magnets	NA	NA	NA	0.68	0.76	0.80	0.99	1.19	1.17	1.40	NA	1.23	1.00	0.90	0.72	0.63	0.44	0.47	0.55
	Average	NC	NC	NC	NC	1.19	1.18	1.20	1.39	1.36	NC	NC	NC	1.33	1.17	1.17	1.19	1.13	1.12	NC

Source: Official Stock Exchange Directory, Bombay

NA not available
NC not computed (because figures are not available for all the firms)

TABLE 9: Rate of Return on Capital Employed

Sl.No	Name/ Particulars	1979	1980	1981	1982	1983	1984	1985	1986
	GENERAL ENGINEERING								
1	S L M Maruti Industries	12.39	15.84	13.90	13.10	13.43	10.51	3.29	0.17
2	Triveni Engineering Works	13.89	14.84	NA	15.10	16.75	15.93	18.23	14.40
3	Premier Automobiles	10.65	1.28	41.86	31.09	17.24	16.34	11.56	16.37
4	Widia(India)	18.38	17.56	20.16	18.38	17.07	11.90	14.35	15.89
5	Walchandnagar Industries	15.05	9.20	14.42	10.76	6.30	9.45	6.76	-2.98
6	TexMaco	10.16	14.27	14.50	13.21	7.71	4.43	1.25	8.23
7	Voltas	14.28	18.14	17.94	17.13	16.79	13.88	12.41	13.41
8	Atlas Copco(India)	14.44	18.79	21.74	19.87	13.44	15.12	14.34	13.66
9	Lakshmi Machine Works	13.97	16.81	19.16	25.68	17.68	15.48	14.40	15.03
10	Sandvik Asia	13.86	13.89	16.40	21.77	16.86	7.90	15.34	16.41
11	Elecon Engineering	13.71	18.03	21.21	18.51	21.28	16.41	17.31	19.05
12	Larsen Toubro	16.92	16.54	15.01	15.87	15.84	14.29	13.02	10.98
13	Usha Telehoist	19.73	20.87	NA	22.13	18.95	14.38	9.72	11.56
14	Kirloskar Brothers	15.14	14.44	16.31	16.34	15.62	13.34	15.87	19.16
15	Kunal Engineering	10.78	21.15	17.78	20.06	7.56	5.83	5.91	4.07
16	Acme Manufacturing	7.41	8.38	9.96	11.51	17.79	14.01	14.39	17.51
17	Kirloskar Cummins	20.92	24.51	31.52	25.55	23.01	21.54	18.57	16.03
18	Usha Atlas Hydraulic Equipm	18.84	26.17	22.05	13.46	13.46	11.06	13.16	15.18
19	Bimetal Bearings	12.74	17.03	19.77	26.05	17.18	10.60	14.53	10.81
20	Kinetic Engineering	14.52	17.59	32.48	29.73	34.73	31.98	28.09	31.07
21	Ingersoll Rand	21.76	24.59	30.84	26.25	18.91	24.18	24.14	24.33
22	Mahindra Mahindra	20.58	20.49	20.95	17.81	17.76	14.08	12.62	12.33
23	Macnally Bharat Engineering	14.34	17.06	12.07	17.91	4.65	4.65	5.10	5.99
24	Lakshmi Automotic Loom Wor	1.55	7.40	11.11	9.55	13.64	13.37	14.36	12.93
25	Gabriel (India)	15.65	14.04	16.81	18.00	14.91	19.23	18.97	23.66
26	Tube Investments	12.43	14.69	15.87	14.87	12.15	13.58	14.46	14.27
27	Mahindra Ugine Steel	8.06	14.25	18.27	6.61	3.31	3.31	4.51	16.74
28	Poysha Industrial Co	14.98	16.22	15.25	17.02	15.72	13.74	13.38	11.33
29	Best Crompton Engineering	16.74	17.47	16.60	23.45	23.21	16.52	11.70	10.60
30	Associated Precision Spindl	12.38	22.53	22.62	10.20	9.05	9.10	5.94	-1.19
	Average	14.21	16.47	NC	18.23	15.40	13.54	12.92	12.90

ELECTRICAL ENGINEERING

1	Bajaj Electricals	27.67	25.72	47.85	40.22	35.87	43.54	32.69	27.76
2	Bharat Bijlee	10.03	12.44	16.09	17.51	6.57	12.51	16.37	16.18
3	Crompton Greaves	20.84	21.54	21.58	19.59	13.64	12.33	9.47	11.84
4	Simens	15.03	16.91	17.74	19.36	17.26	12.77	9.23	12.28
5	Hindustan Brown Boveri	15.43	15.55	17.81	15.97	8.89	14.84	14.65	15.04
6	General Electric Co	10.38	7.37	10.10	14.26	14.11	10.61	11.43	13.52
7	Jyoti Electric Motors	15.77	24.27	15.60	18.37	9.76	6.43	13.57	9.22
8	American Refrigerator	-24.31	2.45	0.96	13.00	12.99	15.09	-14.79	12.94
9	National Radio Electronics	8.80	13.12	0.94	30.15	21.39	23.49	15.20	12.70
10	Permanent Magnets	13.93	NA	25.30	15.77	15.94	13.72	10.20	5.63
11	Genelec	17.66	30.26	27.01	26.63	22.61	16.83	17.17	28.99
12	Blue Star	15.83	21.45	19.25	24.86	19.36	22.12	19.03	18.32
13	Electrical Manufacturing Co	18.21	19.87	29.05	23.44	21.13	21.92	20.38	16.25
14	Kelvinator	20.54	28.97	31.25	30.60	25.98	15.66	14.38	15.30
15	Khandelwal Hermann Electric	12.36	8.49	8.65	-1.93	-3.02	12.41	15.63	9.29
16	English Electric Co	19.91	21.83	23.05	27.79	35.54	26.94	25.06	17.04
17	High Energy Batteries	11.03	16.46	12.86	13.31	13.66	12.95	10.39	10.97
18	Electra(India)	15.29	17.66	19.84	21.14	10.34	16.76	13.33	12.88
19	Incab Industries	10.69	12.15	13.90	15.40	13.03	12.64	10.81	13.88
20	Hindustan Electrographites	-11.34	38.07	23.55	12.82	10.28	10.22	4.77	9.01
	Average	12.19	NC	19.12	19.91	16.27	16.74	13.45	14.85

Source : Official Stock Exchange Directory, Bombay
NA : Not Available
NC : Not Computed (because figures are not available for all the firms).

Table 10 : Net Sales to Total Assets

Sl.No	Name/ Particulars	1979	1980	1981	1982	1983	1984	1985	1986
	GNERAL ENGINEERING								
1	S L M Mneklal Industries	0.93	1.01	0.91	0.90	0.88	0.94	0.62	0.62
2	Triveni Engineering Works	0.91	0.99	NA	0.96	0.87	1.06	1.56	1.00
3	Premier Automobiles	1.03	1.35	2.05	1.98	1.57	1.51	0.70	0.78
4	Widia(India)	1.24	1.02	1.25	1.06	0.77	0.81	0.91	0.83
5	Walchand Nagar Industries	0.92	1.00	1.00	0.92	0.66	0.91	0.88	0.66
6	TexMaco	0.97	1.19	1.28	1.14	0.85	0.63	0.38	0.42
7	Voltas	1.99	1.98	2.12	1.84	1.72	1.67	1.30	1.39
8	Atlas Copco(India)	1.72	1.62	1.67	1.47	1.33	1.33	1.49	1.23
9	Lakshmi Machine Works	1.18	1.12	1.11	0.99	1.24	1.59	1.49	1.40
10	Sandvik Asia	0.84	1.00	1.40	1.36	1.32	0.63	1.31	1.34
11	Elecon Manufacturing	0.75	0.64	0.66	0.78	1.03	0.83	0.85	0.88
12	Larsen Toubro	1.19	1.16	1.20	0.85	0.94	0.78	0.65	0.64
13	Usha Telehoist	1.13	1.32	NA	1.04	0.87	0.80	0.64	0.67
14	Kirloskar Brothers	1.22	1.44	1.38	1.23	1.25	1.30	1.20	1.55
15	Kunal Engineering	0.62	0.80	0.98	0.61	0.39	0.41	0.36	0.38
16	Acme Engineering	0.49	0.68	0.77	0.92	1.24	1.15	1.13	1.10
17	Kirloskar Cummins	1.29	1.67	1.71	1.32	1.38	1.28	1.39	1.26
18	Usha Atlas Hydraulic Equipments	0.51	0.72	0.88	0.71	0.73	0.77	0.71	0.84
19	Bimetal Bearings	0.75	0.77	0.84	0.96	0.77	0.53	0.75	0.60
20	Kinetic Engineering	1.97	1.59	1.39	0.91	1.79	2.71	1.89	2.03
21	Ingersoll Rand	1.25	1.28	1.40	1.25	1.32	1.37	1.29	1.27
22	Mahindra Mahindra	1.64	1.89	1.99	1.79	1.75	1.49	1.19	1.20
23	Macnally Bharat Eng.	1.02	0.46	0.54	0.42	0.52	0.52	0.22	0.87
24	Lakshmi Automotic Loom Works	0.49	0.64	0.77	0.61	0.48	0.44	0.68	0.76
25	Gabriel (India)	0.46	0.46	0.60	0.65	0.74	0.88	1.14	1.12
26	Tube Investments	1.52	1.68	1.64	1.27	1.07	1.20	1.21	1.19
27	Mahindra Ugine Steel	0.35	0.62	0.79	0.62	0.76	0.77	0.77	1.20
28	Poysha Industrial Co.	1.30	1.39	1.51	1.50	1.72	1.44	1.39	1.11
29	Best Crompton Eng.	1.67	1.90	1.76	1.65	1.60	1.67	1.32	1.16
30	Associated Precision Spindles	0.49	0.71	0.63	0.35	0.36	0.40	0.42	0.35
	Average	1.06	1.14	NC	1.07	1.06	1.06	0.99	1.00

	Electrical Engineering								
1	Bajaj Electricals	1.72	1.69	2.16	1.91	1.89	1.80	1.58	1.61
2	Bharat Bijlee	1.40	1.40	1.50	1.32	1.18	1.63	1.52	1.60
3	Crompton Greaves	1.71	1.81	1.57	1.51	1.42	1.33	1.08	1.19
4	Simens	1.60	1.58	1.13	1.18	1.20	1.20	1.07	1.10
5	Hidustan Brown Boveri	1.14	1.08	1.03	1.02	0.85	0.89	1.18	1.13
6	General Electric Co	1.08	1.04	1.15	1.18	1.13	1.07	1.04	1.13
7	Jyoti Electric Motors	2.27	2.35	2.16	1.62	0.90	0.83	0.81	0.85
8	American Refrigerator	0.86	0.94	0.64	0.96	0.82	0.92	1.42	1.06
9	National Radio Electronics	1.23	1.21	1.41	1.56	1.37	1.27	1.57	1.22
10	Permanent Magnets	1.40	NA	1.23	1.00	0.90	0.72	0.63	0.44
11	Genelec	1.96	1.73	2.20	1.93	1.83	1.52	1.37	1.41
12	Blue Star	1.55	2.21	2.54	2.70	2.21	2.09	1.62	1.77
13	Electrical Manufacturing Co	1.61	1.66	1.75	1.77	1.43	1.49	1.23	0.97
14	Kelvinator	2.75	2.77	2.53	2.82	1.80	1.70	1.48	1.68
15	Khandelwal Hermann Electricals	0.34	0.35	0.29	0.31	0.33	0.32	0.37	0.35
16	English Electric Co	1.45	1.55	1.44	1.66	1.75	1.72	1.46	1.49
17	High Energy Batteries	0.89	1.20	1.04	1.16	0.86	1.29	1.10	1.21
18	Electra(India)	1.49	1.41	1.40	1.68	1.00	1.31	1.57	1.42
19	Incab Industries	1.45	1.53	1.47	1.77	1.75	1.62	1.49	1.92
20	Hindustan Electrographites	0.62	1.20	1.17	0.95	1.09	1.31	0.72	1.11
	Average	1.43	NC	1.49	1.50	1.29	1.30	1.22	1.23

Source : Official Stock Exchange Directory, Bombay
NA : Not available
NC : Not computed (because figures are not available for all the firms)

Table 11

Performance of selected Public Sector Enterprises manufacturing capital goods

(Rs Lakhs)

	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
1 Bharat Heavy Electricals														
Gross Sales	36713	47019	50017	66154	74048	81227	94639	117916	132472	153992	177044	199394	231830	270682
Gross Profit to Capital Employed	17.70	22.90	19.50	16.30	12.70	11.70	15.00	17.30	20.00	20.00	23.50	22.80	27.80	25.10
Capital employed	49936	40413	41668	48517	63228	68979	78484	87610	86961	89962	90864	91772	89748	100252
Gross Sales to Capital Employed	0.74	1.16	1.20	1.36	1.17	1.18	1.21	1.35	1.52	1.71	1.95	2.17	2.58	2.70
2 Bharat Pumps and Compressors														
Gross Sales	512	566	1040	1472	1681	1457	1467	2982	3603	2582	4564	4559	3395	4171
Gross Profit to Capital Employed	2.50	0.70	1.70	6.20	7.70	0.80	4.00	10.00	13.00	5.20	15.00	3.30	-4.80	[illegible]
Capital employed	1143	1679	2080	2836	3081	3040	2979	3539	3750	4057	4074	4226	3231	
Gross Sales to Capital Employed	0.45	0.34	0.50	0.52	0.55	0.48	0.49	0.84	1.01	0.64	1.12	1.08	1.05	[illegible]
3 Bridge and Roof (India)														
Gross Sales	1260	1669	1884	2347	2498	2962	2535	4578	5653	5192	4908	5349	5561	5456
Gross Profit to Capital Employed	Loss	26.50	20.80	19.70	7.10	Loss	Loss	23.90	20.80	33.80	29.30	13.60	13.04	13.12
Capital employed	339	308	432	483	538	481	529	1032	1780	1159	1538	1664	1810	2111
Gross Sales to Capital Employed	3.72	5.42	4.36	4.86	4.64	6.16	4.79	4.44	3.18	4.48	3.19	3.21	3.07	2.58
4 Heavy Engineering Corporation														
Gross Sales	6583	7566	5912	7312	6132	6470	10690	11167	10525	15641	18820	24460	27201	32243
Gross Profit to Capital Employed	Loss	Loss	Loss	Loss	Loss	Loss	Loss	Loss	Loss	Loss	Loss	Loss	96.06	11.19
Capital employed	20707	22274	19341	18663	16138	12341	10513	16337	4059	13477	7663	4836	5884	26341
Gross Sales to Capital Employed	0.32	0.34	0.31	0.39	0.38	0.52	1.04	0.68	0.75	1.16	2.46	5.06	4.62	1.22
5 Jessop and Co.														
Gross Sales	3768	4605	4238	3606	3334	3720	4249	5105	5728	6075	6085	6392	8106	9261
Gross Profit to Capital Employed	0.70	11.00	Loss	Loss	Loss	Loss	Loss	Loss	0.40	3.30	3.00	5.30	5.10	7.90
Capital employed	4925	4738	4909	4158	4705	4738	5235	5382	5557	5645	5765	6339	6483	7009
Gross Sales to Capital Employed	0.77	1.01	0.86	0.87	0.71	0.79	0.81	0.95	1.03	1.08	1.05	1.01	1.25	1.32
6 Mining and Allied Machinery Corpo.														
Gross Sales	2818	2821	1902	2620	2931	2989	3760	5046	5067	5103	5608	7861	7745	7969
Gross Profit to Capital Employed	7.70	6.30	Loss	Loss	Loss	Loss	Loss	Loss	Loss	Loss	Loss	18.90	-2.37	-8.03
Capital employed	3933	4359	2473	2697	2585	1955	2043	4212	4167	3947	3218	4320	5283	6124
Gross Sales to Capital Employed	0.72	0.65	0.77	0.97	1.13	1.53	1.84	1.20	1.22	1.29	1.80	1.82	1.47	1.30
7 Triveni Structurals														
Gross Sales	805	928	878	1095	1157	1039	1326	127[illegible]	1693	2931	3363	3905	3169	3912
Gross Profit to Capital Employed	11.10	11.60	10.20	8.70	8.80	Loss	Loss	Lo[illegible]	Loss	9.50	175.60	93.10	-14.73	2.20
Capital employed	983	1102	1219	1455	1451	1348	1230	11[illegible]	336	601	178	1357	1215	1907
Gross Sales to Capital Employed	0.82	0.84	0.72	0.75	0.80	0.77	1.08	1.1[illegible]	5.04	3.66	18.89	2.88	2.61	2.05

	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
8 Balmer Lawrie														
Gross Sales	2382	2820	2640	3509	4162	4413	4734	4721	6652	8188	12235	14216	17352	22257
Gross Profit to Capital Employed	15.90	17.20	28.40	29.90	29.00	22.20	25.20	18.50	24.40	21.40	28.80	25.40	29.30	26.00
Capital employed	730	641	406	685	997	1561	1486	1927	2128	2724	3254	3729	4317	5458
Gross Sales to Capital Employed	3.26	3.15	6.50	5.12	4.17	2.83	3.19	2.45	3.13	3.01	3.76	3.81	4.02	4.08
9 Bharat Electronics														
Gross Sales	5567	6537	7460	7638	8295	6891	12844	14228	15493	18653	21978	29562	37792	49692
Gross Profit to Capital Employed	12.90	16.90	20.40	23.70	15.70	16.70	27.70	25.50	25.10	25.70	21.30	20.50	15.16	14.55
Capital employed	2988	3200	3622	5973	7241	7645	9175	11212	13572	14630	17597	23108	31863	38850
Gross Sales to Capital Employed	1.86	2.04	2.06	1.28	1.15	0.88	1.40	1.27	1.14	1.27	1.25	1.28	1.19	1.28
10 Electronic Corporation														
Gross Sales	2445	2597	2815	3406	3895	3484	5806	6675	7235	8196	12484	16838	18418	21493
Gross Profit to Capital Employed	13.30	13.50	4.80	3.80	8.90	Loss	14.90	13.30	9.80	13.00	21.30	19.90	13.50	8.50
Capital employed	3028	2812	3155	2777	3210	2651	3371	4368	4601	5222	6397	7191	10784	13794
Gross Sales to Capital Employed	0.81	0.92	0.89	1.23	1.21	1.31	1.72	1.53	1.57	1.57	1.95	2.34	1.71	1.56
11 Hindustan Cables														
Gross Sales	3512	4136	4408	4983	5685	6885	8616	10327	12495	14717	19224	27057	36675	50150
Gross Profit to Capital Employed	13.70	18.60	22.90	12.90	1.40	20.80	17.70	15.80	17.40	22.20	18.90	17.90	15.06	16.12
Capital employed	2955	1812	2136	4667	5394	5400	6051	8414	9746	12444	15628	22966	28829	29752
Gross Sales to Capital Employed	1.19	2.28	2.06	1.07	1.05	1.28	1.42	1.23	1.28	1.18	1.23	1.18	1.37	1.69
12 Hindustan Machine Tools														
Gross Sales	8275	9084	11833	16845	18275	18834	26046	26856	32941	35738	37891	43965	47043	57705
Gross Profit to Capital Employed	15.40	14.80	11.00	18.60	21.40	17.70	23.30	22.60	18.00	13.40	10.10	9.90	8.80	10.40
Capital employed	8999	9888	11595	11246	15220	17134	21030	23481	26854	34023	36788	40171	41361	42110
Gross Sales to Capital Employed	0.92	0.92	1.02	1.50	1.20	1.10	1.24	1.14	1.23	1.05	1.03	1.09	1.14	1.37
13 Bharat Earth Movers														
Gross Sales	6498	8018	8543	9856	12007	8791	22175	33510	38263	42639	48299	50615	50322	62168
Gross Profit to Capital Employed	15.00	16.50	18.00	14.90	25.90	15.10	30.20	28.80	22.70	20.60	18.20	17.50	16.70	17.20
Capital employed	7801	7546	6876	7297	9511	10365	12829	20319	29121	36376	39015	45601	54946	57698
Gross Sales to Capital Employed	0.83	1.06	1.24	1.35	1.26	0.85	1.73	1.65	1.31	1.17	1.24	1.11	0.92	1.08
14 Praga Tools														
Gross Sales	525	592	430	587	738	924	757	1109	1482	1699	2408	3513	3834	4538
Gross Profit to Capital Employed	9.70	9.60	2.30	3.70	9.70	12.90	12.70	12.10	16.80	13.00	14.10	15.80	13.40	10.80
Capital employed	688	714	809	961	1081	1082	1035	1266	1446	1801	2233	2802	3099	3818
Gross Sales to Capital Employed	0.76	0.83	0.53	0.61	0.68	0.85	0.73	0.88	1.02	0.94	1.08	1.25	1.24	1.19

(continued)

	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
15 Indian Telephone Industries														
Gross Sales	7562	8828	9248	9293	10937	8831	15726	18205	21211	23693	29953	44070	61225	62520
Gross Profit to Capital Employed	16.40	19.40	16.00	11.00	17.00	8.10	18.30	17.50	15.00	16.80	12.80	12.30	15.20	15.30
Capital employed	6675	7641	8567	10114	11968	13748	16172	21334	26170	30396	39792	86573	70646	82170
Gross Sales to Capital Employed	1.13	1.16	1.08	0.92	0.91	0.63	0.97	0.85	0.81	0.78	0.75	0.51	0.87	0.76
16 Instrumentaion Ltd.														
Gross Sales	1060	1521	1517	2820	3609	4094	5234	6407	6721	6790	6493	7230	8621	10154
Gross Profit to Capital Employed	7.50	12.80	19.10	22.40	22.10	20.10	18.30	17.00	19.90	17.90	15.60	14.80	12.70	11.70
Capital employed	1545	1545	1835	1905	2290	2776	3921	4707	4539	5018	5317	5751	7407	7976
Gross Sales to Capital Employed	0.69	0.98	0.83	1.48	1.58	1.47	1.33	1.36	1.48	1.35	1.22	1.26	1.16	1.27
17 Bharat Heavy Plate Vessels														
Gross Sales	1636	2527	2194	1689	2840	3071	2901	4256	4807	8008	9441	9558	14853	14034
Gross Profit to Capital Employed	4.50	7.20	9.10	Loss	11.50	15.40	15.70	18.70	26.40	34.60	25.20	4.00	11.70	10.03
Capital employed	3060	3398	2868	2568	3007	2653	2490	2129	2467	3418	4346	4451	5252	8046
Gross Sales to Capital Employed	0.53	0.74	0.76	0.66	0.94	1.16	1.17	2.00	1.95	2.34	2.17	2.15	2.83	1.74

Source: Government of India, Ministry of Industry,
Bureau of Public Enterprises, Public Enterprises Survey

TABLE 12

RATE OF RETURN ON INVESTED CAPITAL

YEAR	Rate of Return (%)	
	MACHINERY (Non-Elect.)	MACHINERY (Elect.)
1978-79	19.77	19.46
1979-80	18.78	19.90
1980-81	21.68	22.01
1981-82	21.92	23.21
1982-83	21.29	25.99
1983-84	19.53	27.09
1984-85	23.71	32.34
1985-86	22.47	20.97

Source: Computed from ASI data

TABLE 13

Rate of Customs Duty (range indicated) on Imports of Raw Materials, Intermediate Products and Investment Goods in Some of the Developing Countries during 1985*

Sl. No.		Rates of customs duty
Asian countries		
1.	India	40-150
2.	Korea, Republic of	5-30
3.	Thailand	0-50
4.	Philippines	10-40
5.	Singapore	5***
6.	Malaysia	0-55
7.	Indonesia	5-40
Latin American Countries		
8.	Argentina	0-20
9.	Brazil	0-85
10.	Chile	20**
11.	Columbia	22-40
12.	Mexico	0-50
13.	Venezuela	1-90

Source: United Nations (UNCTAD), Hand Book of Trade Control measures of Developing Countries 1987.

* excludes customs duty on Motor Vehicles and their parts
** uniform rate of duty
*** generally very low duty on imports, approximately 5 per cent

Chart 1

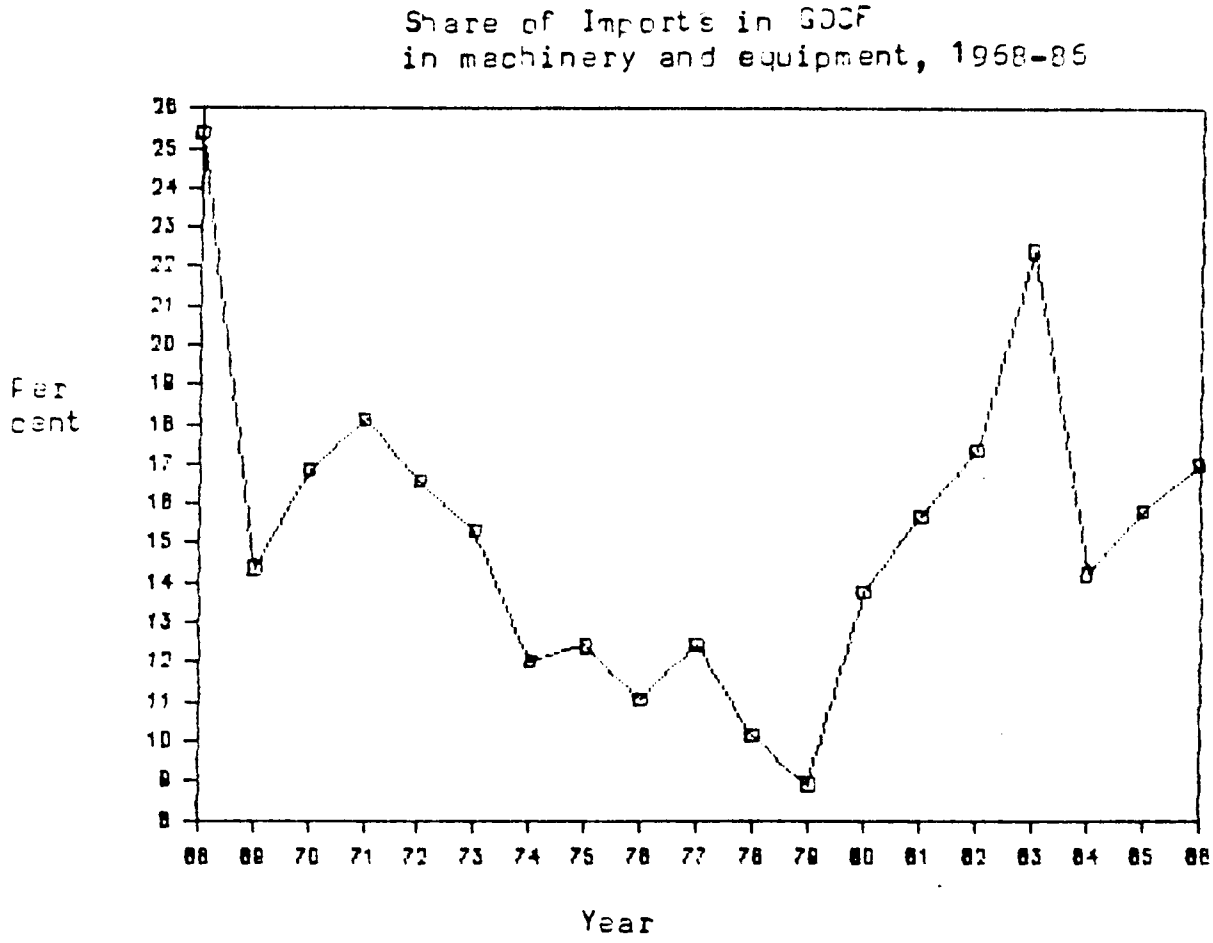
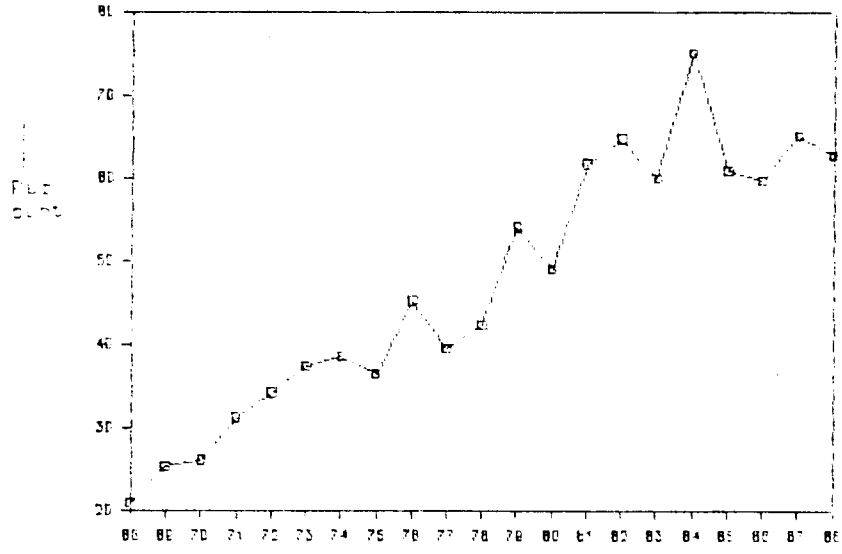

Share of Imports in GDCF
in machinery and equipment, 1968-85
Per cent
Year

Chart 2

Average Realised Tariff Rate
machinery & Transport Equipment, 1968-88



Year

Chart 3

Imports of Machinery & Transport Equipment
Quantity Index (1968=100), 1968-88

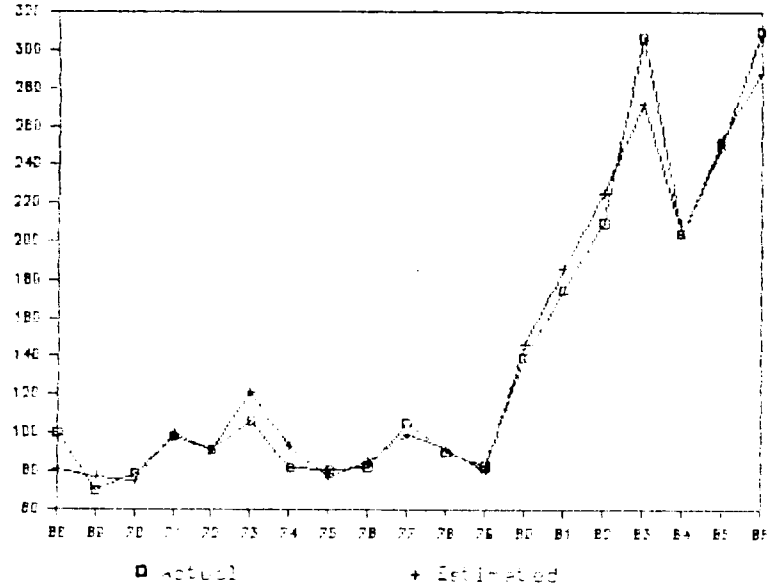
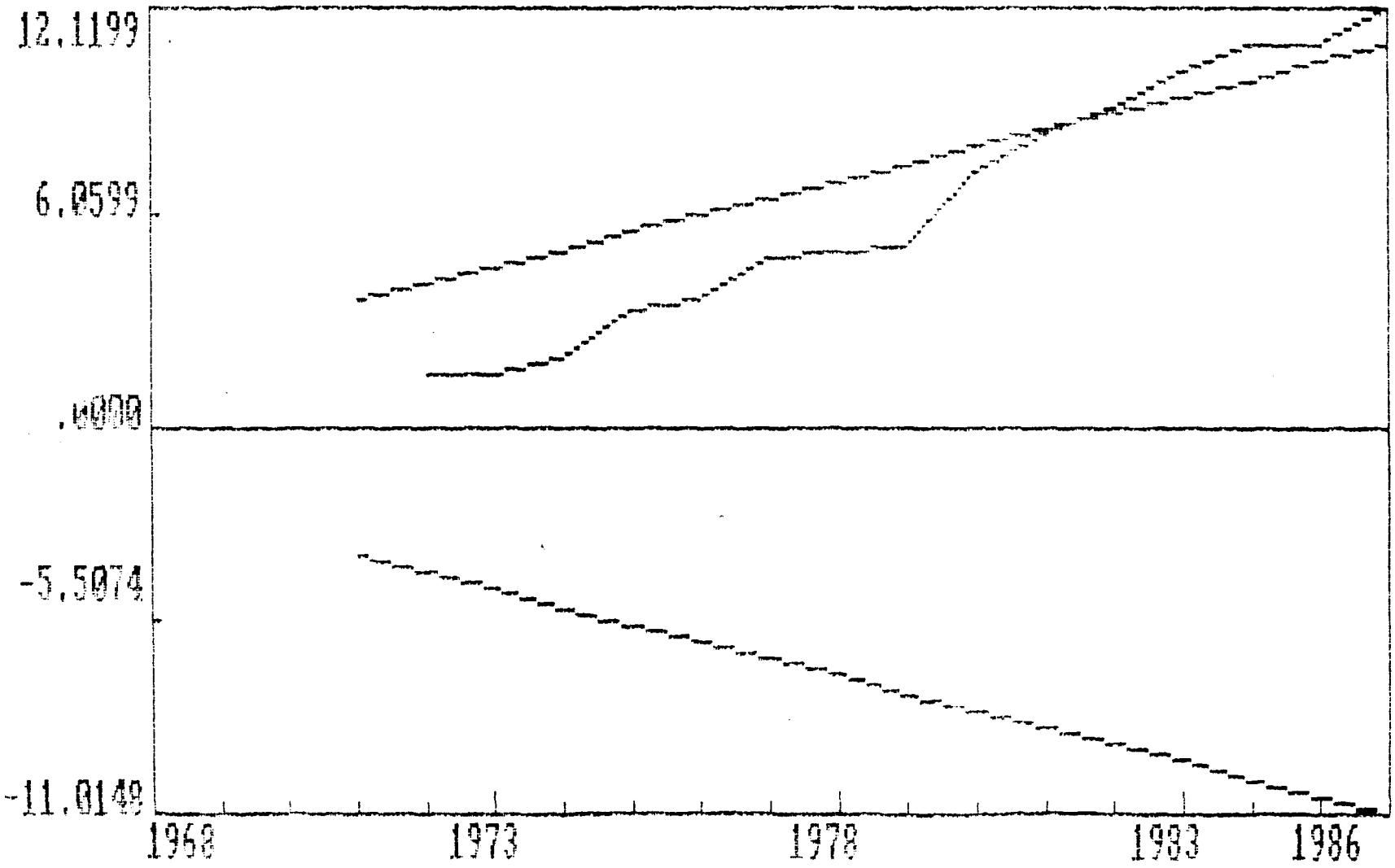


Chart 4

Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

NOTES

1. Imports of OGL group III is dominated by one RITC category at 7-digit level, namely, 728.4809. This category includes 136 OGL items. Imports under this category in 1986-87 was Rs.1362 crores. Taking 10 per cent of this figure as import under OGL, the average value of imports of OGL items belonging to 728.4809 turns out to be about Rs. one crore.

2. In Table 1 and in the analysis presented later in the paper, a narrow definition of capital goods is used to cover only machinery and equipment (RITC 7). A broader definition is used for computing the relative share of capital goods under OGL, because a large number of items in the OGL list for capital goods belong to RITC codes 87 and 88.

3. It should be realised further that the entire increase in imports of these 201 items between 19844-85 and 1986-87 cannot be attributed solely to their being placed under OGL.

4. Deficiencies of unit value indices are well known. However, no better price index is readily available to deflate the imports value series.

5. The investment series has been taken from National Accounts Statistics, CSO.

6. Singh and Ghosh (1988) have presented two sets of import-availability ratios - for one set they use ASI data and for the other they use DGTD data. However, they base their conclusions about trends in import penetration on the second set of ratios, i.e. the ones computed from DGTD data. The import-availability ratios computed by them from ASI data do not show any significant rising trend, as in the ratios computed by us in the present study.

7. Tariff rates shown in the table include basic, auxiliary and additional duties. Imports of project goods and duties on them are included.

8. From the available estimates of capital goods imports and customs revenue collection for 1989-90, the average realised tariff rate turns out to be above 65 per cent.

9. It should be noted that the domestic wholesale price index for machinery includes excise duty, the unit value of imported machinery does not include customs duty, and the average realised tariff rate includes basic, auxiliary and additional (equal to excise) customs duties.

10. The value of R^2 is higher. All the coefficients are statistically significant. Also, there is an improvement in DW-statistic.

11. For details of CUSUM test, see Brown, Durbin and Evans (1975).

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