Study of India's Tariff Structure :
Effect of Tariff Protection on Domestic Industries

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1. Introduction

In Parts I and II of the study we had examined the nominal and effective rates of protection accorded to Indian industries by the tariff system. Among the various issues examined were the level of protection and the inter-industry pattern. This part of the study is concerned with the effect of tariff on domestic industries.

In Section 2, some theoretical issues concerning the effect of tariff on domestic industrial production are discussed. Section 3 presents a brief review of the available literature on the effect of protection on India's industrial performance. In Section 4, results of our empirical analysis are presented. Section 5 summarizes and concludes.

2. Tariff and Industrial Production: Theoretical Issues

2.1 Micro-economic Aspects

To analyse the effect of tariff on domestic industry, the partial equilibrium framework was used in the 1950s. The focus was only on the industry or sector being protected. In the standard competitive model, a tariff increase for a product results in a reduction in imports of the product and an increase in the output of domestic industry. This enables the domestic industry to capture a larger share of the domestic market. In the oligopolistic models also, the same effect of tariff on the production of domestic firms (i.e. expansion of domestic industry) was envisaged.

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While the micro-economic analysis based on partial equilibrium framework showed tariff to have a favourable effect on the production of the domestic industry, the welfare costs of protection were also recognised. Such costs arise because tariffs drive a wedge between international prices and domestic prices which leads to production and consumption decisions different from what would put the society at the highest level of social welfare. The cost of tariff protection can be decomposed into a 'production cost' and a 'consumption cost' referring to two types of distortions.

Since the mid 1970s, empirical work on trade restrictions has been based on general equilibrium models[1]. Such models incorporate all repercussions of tariff hike on production, including effect on X-efficiency, the terms of trade, income and employment beyond the industry under consideration. Since both direct and indirect effects are captured, these studies provide substantially higher estimates of the costs of protection than do the studies based on partial equilibrium analysis.

There is also a body of literature that points to the ineffectiveness of import protection in stimulating domestic production under certain conditions. Metzler (1949) points out the possibility that if the small country assumption is not valid and the world prices are allowed to change, the tariff may depress the world prices of the imported good to such an extent that tariff inclusive domestic prices are lower than before, and in that case it may reduce domestic production. Baldwin (1982) analyzes a number of situations using partial equilibrium framework in which protection causes less than expected increase in domestic production. He draws attention to (a) the possibility that the protected product is imported in a less or more processed form than is covered in the policy and (b) the possibility of switching to substitute products. Baldwin and Green (1988) give examples of firms which do not plough back into the industry the increase in profits due to tariffs if the long-term prospects of the industry are not very favourable to growth. Among other reasons for ineffectiveness of protection is smuggling as noted in Bhagwati and Hansen (1973). Bhagwati and Srinivasan (1980) show how lobbying for protection may also reduce output in the domestic industry.

1. See for example, Boadway and Treddenick (1978), Dixon, et.al. (1977).

The classical argument for free trade is based on the disturbance caused by tariffs in the optimal allocation of resources and the associated dead-weight loss on the country. However, in a world of imperfect competition and increasing returns to scale, protectionism may offer a 'second best' instrument for raising welfare. It would depend on the structure of the market. Under monopolistic competition, the imposition of tariffs increases the profits of domestic firms and lowers the profits of foreign firms, causing exit abroad and entry at home. Foreign firms may attempt to avoid the impact of tariff by setting up production facilities in the domestic economy. Such 'tariff jumping' may increase welfare by increasing product variety and investment in the country imposing tariff.

In the case of oligopoly, the effect of tariff is not clear, since there is much diversity in possible features. However, most models do suggest a role for tariff as a policy instrument to improve welfare. As an example, consider the model of Krugman (1982). Krugman models a duopoly situation with economies of scale at the margin. Tariff increases the share of the home firm in the domestic market to the detriment of the foreign firm. This lowers the home firm's marginal cost and raises that of the foreign firm. Hence, the situation in the foreign market also moves in favour of the home firm.

Macro-economic effects

In his seminal paper, Mundell (1961) concluded that a general tariff will have an adverse effect on output and employment under flexible exchange rates. Mundell recognised at the same time that, with a fixed exchange rate and in the absence of extensive retaliation, a tariff may generate higher output and employment. Mundell's result relies on the Laursen-Metzler hypothesis that savings will increase with improved terms of trade, due to an increase in real disposable income. However, the Laursen-Metzler effect is not a clearly established empirical or theoretical result. Thus, much of the recent work on tariff policy has noted the restrictiveness of the Laursen-Metzler assumption and has attempted to see whether the result of Mundell holds under more generalised assumptions[2].

2. See Kitson and Solomou (1990) for a review.

Chan (1978) shows that when a money market is added to Mundell's model, a tariff is contractionary even without the Laursen-Metzler assumption. Krugman (1982) argues that Mundell's tariff ineffectiveness result holds for a number of monetary extensions of Mundell's 1961 model. These and several other such studies reach similar conclusions because they all share similar features and in particular the quantity theory of money is taken as the valid description of money demand. Ford and Sen (1985) have shown that, in a large number of circumstances, tariffs can have positive effects on output and employment if the money demand function is specified in Keynesian terms, allowing for interest effects on money demand.

The models discussed above are restrictive in that they assume full employment, neglect the specification of investment relationship and ignore economies of scale. In the framework of Kaldor (1970,1982), which differs from these models, there are reasons to expect a favourable effect of tariff on economic performance. In this framework, the Harrod foreign trade multiplier and increasing returns in manufacturing industry occupy an important place. Kaldor argues that the Ricardian rationale for free trade is dependent on the assumption of constant returns to scale. The existence of scale economies in manufacturing implies that a nation that is successful in competing with foreign firms can expect that the advantage of an expanding market will increase its competitiveness, Also, it should be noted that devaluation is a non-selective policy and raises the prices of all imports, not just the competitive ones. Consequently, any attempt to generate a substantial and long-term improvement in competitiveness through the exchange rate may require a large reduction in the nominal rate with repercussions for inflation, real income and economic stability. Accordingly, Kaldor has argued that some form of protection of competitive manufactures would be a more effective policy for securing full employment.

To sum up, tariff may be expected to increase domestic industrial production, though in certain circumstances it may not. Even if tariff succeeds in increasing domestic production, there is a welfare cost arising from the misallocation of resources caused by the imposition of tariff. The cost will be greater if tariff also leads to X-inefficiency.

3. Protection and India's Industrial Performance

It is widely recognised that India's protective regime has succeeded in creating a large and highly diversified industrial base. However, in this process, the considerations of cost, comparative advantage (static) and international specialization have largely been ignored with the consequence that a number of industries have come up and grown over time in which the country does not have comparative advantage. Thus, the industrial structure that has evolved over time is different from what it would have been if the incentive system was more neutral (and the government did not interfere in the flow of resources to different industries).

It is also widely held that the protective regime has been responsible for inefficiency in resource use which has constrained the growth performance of Indian industry. Studies on the effective rates of protection(ERP) and domestic resource cost(DRC) of Indian industries have found these ratios to be generally very high and to be widely varying across industries, indicating thereby that India's foreign trade regime has led to an inefficient allocation of resources among industries.[3] There are other types of inefficiencies as well. It is often argued that the extreme complexity and case-by-case nature of both import licensing and tariff system have given rise to lobbying and considerable "rent seeking" activities with consequent adverse effects on efficiency. Further, sheltering from import competition along with domestic industrial licensing has led to X-inefficiency and lack of technological dynamism. This is manifested in low rates of capacity utilisation and sluggish productivity growth.

Aksoy and Ettori (1992) note that while the Indian trade regime has provided high degree of protection to intermediate and capital goods, the realised protection to consumer goods (as against available protection) has been lower due to greater domestic competition and ability to modernize production facilities. They note further that the growth rate of productivity in intermediate goods and capital goods (especially the former) has been low and this is consistent with the view that protection has affected productivity adversely. They refer to the study of Ahluwalia (1991) in which the growth

3. See, for example, Bhagwati and Srinivasan (1975), p.191; also Aksoy and Ettori (1992).

rates of total factor productivity for the 1980s have been found to be 6.0 per cent per annum for consumer goods, 3.4 per cent per annum for capital goods and only 1.4 per cent per annum for intermediate goods.

That protection of domestic industries and the process of import substitution have adversely affected the productivity performance in Indian industries has been noted in the studies of Goldar (1986, 1986a) and Ahluwalia (1991). Goldar (1986) found a negative relationship between total factor productivity growth and ERP. Goldar (1986a) found a significant negative relationship between total factor productivity growth and the extent of import substitution. Similarly, the results of the analysis carried out by Ahluwalia (1991) indicate that the higher the degree of import substitution in an industry, the lower is its productivity growth.

In some studies, attempts have been made to estimate the welfare loss due to inoptimal allocation of resources caused by the tariff system. Venkataramanan (1987) has made such an estimate for India for the year 1983-84. His calculations indicate that the cost of protection for that year was Rs 1841 crore which comes to only about one per cent of the net national product. Venkataraman notes that his estimate indicates the cost of tariff protection in India to be small. Similarly, in the study Mitra (1990), the welfare implications of tariff reduction and reform are found to be very small. The low cost of protection in terms of welfare loss as found in these studies has been attributed to the semi-closed nature of the Indian economy. Also, it has been pointed out that in the analysis undertaken the effects of tariff on technological and X-efficiency are not taken into account. If that is done, the estimate of cost of protection would be much larger.

In a recent study, Mitra and Go (1992) have presented estimates of the effect of freer international trade on gross output and rate of return in different sectors of the economy. They have made use of a general equilibrium model. The results of this analysis are useful in making an assessment of the effect of protection on the production level and profitability of domestic manufacturing. The analysis of Mitra and Go is based on data for the year 1987-88. Instead of analysing a situation of completely free trade ,i.e.no trade taxes and quantitative import restrictions, they consider a more realistic

situation of freer trade in which protective tariffs are assumed to be lowered to a uniform 20 per cent, quantitative restrictions are assumed to be eliminated and MODVAT is extended to claim full credit for excise and CVD paid on capital goods.

The results of the simulation exercise carried out by Mitra and Go (1992) indicate that a movement towards freer trade would cause the manufacturing sector to contract and its profitability to go down. The worst affected sectors would be chemicals, basic metals, and machinery. The extent of contractionary effect of tariff reduction would depend on the compensatory fiscal adjustment made. If it takes the form of excise duty hike, then the decline in manufacturing sector output will be 4.8 per cent and the fall in the rate of return will be 4.1 per cent. The contractions in output of basic metals and machinery would be 15.7 per cent and 16.4 per cent respectively. Based on the analysis of Mitra and Go (1992), it may be inferred that the protection provided by the foreign trade regime has enabled Indian manufacturing (especially the intermediate and capital goods industries) to be bigger in terms of value of production and better in terms of profitability than what it would have been in a situation of freer international trade.

Aksoy and Ettori (1992) have carried out a careful analysis of the effect of protection provided by the foreign trade regime on the performance of domestic industries. One important conclusion of their study is that the policy of high taxes and tariff on capital goods and key intermediates have escalated the costs of production in India across a wide spectrum of industries. The policy of keeping landed price of imports (especially for intermediates) higher than domestic prices has induced domestic firms to enter these areas, disregarding considerations of comparative advantage and international competitiveness. These uneconomic investments have in turn caused further tariff escalation and raised production costs of all downstream industries.

Aksoy and Ettori note that high taxes and tariff on capital goods in India have led to high capital costs and this has created problems in interpreting the effective rates of protection for manufacturing industries. They argue that even if Indian firms are as efficient as foreign firms, they will show higher prices and ERP due to the higher capital costs.

In this connection, it may be mentioned that Ettori (1990) has studied data for 60 appraisal reports for new investments prepared by ICICI and IDBI during 1988 and 1989. It is found that a large portion of the high observed effective rates of protection are actually a compensation for the high investment costs in India. In heavy chemicals, basic steel products and synthetic yarns the actual effective rates of protection are found to be 69, 72 and 77 per cent. But, the rates of effective protection needed for compensating for high capital costs are 41, 46 and 60 per cent respectively. Thus, the net effective rates of protection are 28, 26 and 17 per cent respectively. The analysis of Ettori (1990) indicate that the protective system on an average does not give high net protection to the industrial sector.

Several studies have noted that Indian foreign trade regime has created a significant bias against export activity. A study undertaken by ICICI (1985) for 51 companies for 1980-81 brings out that effective protection to export sales was negative for many products, while that to domestic sales was generally positive and high. Taking an average for the 51 companies, the effective rate of protection to export sales was found to be -26 per cent and that to domestic sales, 104 per cent. Similar analysis carried out for a small number of items for the year 1986 in a study of the World Bank (1989) confirms the finding of the study of ICICI that effective protection to export sales is generally lower than that to domestic sales. A recent study of the World Bank[4] (1991) finds that domestic profitability is significantly higher than export profitability even when the export incentives are taken into account. It has been pointed out that while export incentive measures can provide compensation for tariff and domestic taxes on intermediate input, they do not compensate for the high capital cost due to tariff and high taxes on capital goods.

To examine the differential impact of tariffs and taxes on domestic costs and export profitability, data for 60 appraisal reports prepared by ICICI and IDBI during 1988 and 1989 were analysed by Ettori (1990). The average domestic profitability was found to be 12.9 per cent, While the average export profitability (without incentives) was found to be -33.2 per cent. Evidently, in the absence of incentives, the protective system had a strong bias against exports. If all tradeable inputs were available at world prices,

4. Aksoy (1991).

the export profitability would have improved to -0.2 per cent. If capital goods were also available at world prices, the average export profitability would have improved to 10.7 per cent. One important implication of these results is that in a fully free trade regime the firms would have earned nearly the same rate of return as they are doing in the protected environment.

4. Empirical Results

In this section, we present the results of our empirical analysis of the effect of tariff on Indian industries. We have considered four aspects of industrial performance, namely (1) growth, (2) factor remuneration, (3) capacity utilization, and (4) exports. These are discussed in Sub-sections 4.1 through 4.4.

The effects of restrictive trade policies on India's industrial performance has been discussed in several earlier studies (e.g. Bhagwati and Srinivasan, 1975; World Bank, 1989). But, there has been very little econometric analysis of this important issue. Therefore, the present analysis of the effect of tariff protection on the performance of Indian industries, based on econometric techniques, should be of interest.

Protection to domestic industries is provided by both tariff and non-tariff barriers. Hence, for a proper analysis of the effect of protection, both types of trade barriers should be taken into account. This requires quantification of import barriers, such as import licensing and canalization, as well as assessment of tariff redundancy or 'water in tariff' arising from domestic competition and price controls. It has, however, not been possible for us to quantify the non-tariff barriers and incorporate them in our analysis, since these take many forms and their quantification would have been a major exercise in itself[5]. This is clearly a serious limitation of our analysis.

5. We have used tariff rates to measure nominal protection. A more appropriate way of measuring protection is to base it on direct price comparisons. This will take into account both tariff and non-tariff barriers. However, there are a number of problems in making price comparisons. These have been discussed in the earlier parts of the study.

Another limitation of our analysis is that it is based mainly on cross-sectional regressions and inasmuch as there is considerable heterogeneity among industries the results get affected. However, in most cases, we have used a large number of observations and we hope therefore that problem created by heterogeneity among industry may not be very serious.

4.1 Growth

Tariffs affect the structure of incentives and this may influence the flow of resources to different industries. In the absence of government intervention in the flow of resources, one would expect resources to flow into industries enjoying high effective protection (due to tariff and/or non-tariff barriers) rather than to industries in which the effective rate of protection is low. Accordingly, one may hypothesize a positive relationship between ERP and growth rate across industries. Such a relationship may not, however, hold in the Indian situation because the government has been exerting a major control on the flow of resources to different industries through various measures including industrial licensing and public sector investment.[6] Thus, an industry may be quite profitable but capacity expansion may not be permitted, while an industry which is unprofitable may get more investment by the government.

It is evident that one may not find a strong positive correlation between growth rates of different industries and their effective rates of protection. Indeed, in the analyses carried out by us, we do not find any significant positive correlation between these two variables.

Three exercises have been carried out to study the relationship between ERP and the growth rate of industry. In the first exercise, we make use of Index Number of Industrial Production for computing the rates of industrial growth. ERP estimates for various industries (or input-output sectors) were presented in Part II of the study for the years 1980-81,1983-84 and 1989-90. We have taken an average of the figures for three years to obtain average ERP for different industries. From the Index Number of

6. Another point to be noted in this context is that ERP may not correctly reflect protection to value added due to subsidies to non-tradeable and primary inputs and labour market imperfections.

Industrial Production, growth rates in industrial production have been computed for the period 1980-81 to 1988-89. Since the classification used in the Index Number of Industrial Production is different from the classification in the input-output table (1983-84) which we have used for ERP estimation, we are not able to get comparable estimates for all the industries. For 48 cases, we are able to match the ERP estimates and the growth rates of production (see Annexure I). The correlation coefficient between average ERP and growth rate of industrial production is found to be 0.16. It is positive but not statistically significant.

In the second exercise, we have computed growth rates of value added (measure of industrial output) for the period 1980-81 to 1987-88 using data from Annual Survey of Industries (ASI).[7] In this case, we are able to match ERP and industrial growth rate for 62 industries, i.e. almost all input-output sectors engaged in manufacturing activity. The correlation coefficient between average ERP and the growth rate in value added (at current prices) is found to be 0.22. It is positive, but not statistically significant (at 5 per cent level).

In the third exercise, we have computed the correlation coefficient between growth rate of production and tariff rate for 135 disaggregated industries for the year 1989-90. Production data have been drawn from DGTD resources. Since we do not have ERP estimates at disaggregated industry level, the tariff rates (nominal protection) have been used. The correlation coefficient is found to be 0.1. Again, it is positive, but not statistically significant.

The results of these exercises show that no significant positive correlation exists between the inter-industry patterns of ERP and growth rates. To carry this line of analysis further, it would be interesting to compare the average ERP and growth performance by major industrial classes. This comparison is presented in Table 1. Growth rates of industrial production (based on industrial production indices) have been computed for the period 1980-81 to 1989-90 according to use-based and input-based

7. At the time, this analysis was undertaken more recent ASI data were not available.

industrial classes. Average ERP for the years 1980-81, 1983-84 and 1989-90 have been obtained from the ERP estimates for industrial classes which were presented in Part II of the study.

It is interesting to note from the table that intermediate goods and consumer non-durables have relatively high ERP. But in terms of growth performance, they are at the bottom. Capital goods have the lowest ERP among various use-based industrial classes, while the growth rate of production of this industrial group has been relatively high.

Again, in terms of input-based classes, we find that agro-based industries have the highest ERP and the lowest growth rate. It should, however, be pointed out here that there is considerable tariff redundancy in agro-based industrial products and the realised protection to such industries is probably much lower than the potential protection accorded by the tariff system.

Considering Table 1 along with other evidence presented above, it may be concluded that the industries which received relatively greater effective protection from the tariff system have not shown significantly better growth performance. This is perhaps due to the fact that there were other and more important factors influencing the growth of industries.

Tariff hike of the 1980s and its influence on industrial growth

During the 1980s, there was a significant hike in tariff rates. In 1980-81, the import- weighted average rate of nominal tariff was 38 per cent. In 1989-90, it rose to 89 per cent. The collection rate of duty increased in this period from 20 per cent to about 44 per cent. For manufactured articles, the increase in the import-weighted average rate of import duty was from 38 to 98 per cent. This raises the following question: has this large increase in the rates of import duty contributed to industrial growth, since it must have discouraged imports and thereby encouraged domestic production.

Table 1: ERP and Industrial Growth

	Average ERP 1980-81,1983-84 and 1989-90	Growth rate in industrial production 1980-81 to 1989-90
Industrial Groups		
Use-based classification		
Basic goods	92.9	6.1
Intermediate goods	135.8	5.3
Capital goods	66.3	11.5
Consumer durables	97.7	13.8
Consumer non-durables	136.3	5.7
Input-based classification		
Agro-based	141.7	3.0
Chemical based	119.2	9.7
Metal-based	91.4	5.4
All Manufacturing	116.4	7.8

Note : Computed from Handbook of Industrial Statistics, 1991, Tables 70 and 73. Average ERP is based on ERP estimates which were presented in Part II of the study.

We make an attempt here to provide some estimate of the contribution of tariff hike to the growth of domestic capital goods industry (machinery and transport equipment). Goldar and Renganathan (1990) have estimated an import demand function for capital goods. The price variable used in the model takes into account the rate of tariff (realised rate of duty). They found significant response of imports to changes in prices and tariff. The price elasticity was found to be 0.655. Between 1980-81 and 1988-89, the realised rate of import duty on capital goods increased from 49 per cent to 66 per cent. Based on the import demand function estimated by Goldar and Renganathan, the effect of this tariff hike is a 7.5 per cent lower imports in 1988-89 compared to what it would have been if the tariff rate on capital goods had not changed between 1980-81 and 1988-89. Using this figure one can compute what would have been the imports of capital goods if tariff rates had not changed, and assuming further that the increase in imports would have been entirely at the cost of domestic production, one can also work out the level of domestic production in that hypothetical situation. The computations are shown in Table 2.

The computations presented in Table 2 show that the output of the capital goods sector (at constant prices) grew at the rate of 8.5 per cent per annum between 1980-81 and 1988-89. In the absence of a hike in tariff on capital goods, imports would have been higher in 1988-89 by about Rs. 204 crores (at 1981-82 prices). The growth rate of domestic production in that case would have been 8.3 per cent per annum (between 1980-81 and 1988-89), which is only marginally lower than the actual growth rate of 8.5 per cent per annum.

Table 2: Tariff hike and domestic capital goods production

(Rs.crore)

	Actual (at 1981-82 prices)		Simulated* (at 1981-82 prices)	
Year	Imports	Production	Imports	Production
1980-81	1574	11832	1574	11832
1988-89	2725	22676	2929	22472
Growth rate (% p.a.)	7.1	8.5	8.1	8.3

* For the simulation, it is assumed that the rate of tariff on capital goods did not change between 1980-81 and 1988-89.

While tariff hike on final capital goods was favourable to domestic industry, increases in tariff on raw materials (e.g. metals), and parts and components had the opposite effect, since it raised the cost and price of domestically produced capital goods. On balance, it seems, capital goods industry gained very little from the increases in tariffs that took place during the 1980s.

Such analysis has to be carried out for all the major industries to make an assessment of the effect of the tariff hike on the growth performance of aggregate manufacturing. This would require estimation of import functions for various categories of manufactured articles as well as building some general equilibrium model to take into account inter-dependence among industries. We could not undertake such an analysis. We are of the view, however, that the contribution of tariff hike to the growth of the manufacturing sector during the 1980s has been small. The hike in tariff in basic goods and capital goods, even if beneficial to such industries, must have caused significant cost escalation in the user industries, which depressed their growth performance. Many of the downstream industries, especially the ones with large number of units and low capital intensity, did not gain from increases in tariff rates for their products because there was considerable tariff redundancy.

4.2 Factor remuneration

Tariff protection is expected to have a favourable effect on the remuneration of primary factors. It may be hypothesized that other things remaining the same a higher ERP would be associated with higher income of primary factors. To test this hypothesis for Indian industries we have estimated the following two equations using cross-sectional data:

$$w = a_1 + b_1 (K/L) + c_1 ERP$$

$$r = a_2 + b_2 (K/L) + c_2 ERP$$

where w is the wage rate, r the profit rate, K/L capital-labour ratio and ERP the effective rate of protection. Since industries differ in capital intensity and this may influence the productivity of factors of production, we have included capital-labour ratio as an explanatory variable.

The above two equations have been estimated using data for 62 industries (sectors of I/O table). Data on w, r and K/L have been drawn from Annual Survey of Industries (ASI). The estimation of the equations has been done for the years 1980-81, 1983-84 and 1987-88. Our estimates of ERP for 1989-90 have been used in the equations estimated for 1987-88.[8] The results are presented in Table 3.

The properties of well-behaved production functions require that an increase in capital-labour ratio should lead to an increase in labour productivity and a fall in capital productivity. Accordingly, a positive relationship is expected between w and K/L and a negative relationship between r and K/L. Since higher effective protection should enable the primary factors to earn more, one would expect ERP to have a positive relationship with both w and r.

It is seen from Table 3 that the coefficient of K/L is positive and statistically significant in the estimated equations for wage rate, while it is negative and statistically significant in two of the three estimated equations for profit rate. The coefficient of K/L is found to be positive in the estimated equation for profit rate for 1987-88, but it is statistically insignificant. Thus, on the whole, the results in respect of the capital intensity variable are in accordance with our expectations.

8. At the time this analysis was undertaken, ASI data were not available for years after 1987-88. This is the reason why we could not estimate the equations for 1989-90. Further, we did not have estimates of ERP for 1987-88. It became therefore necesary to use ERP estinate for 1989-90 in the equations estimated for 1987-88.

Table 3

ERP and Factor remunerations, Regression Results

(n = 62)

Dependent variable	Year	Explanatory variables		R^2
		K/L	ERP	
w	1980-81	0.048	-0.010	0.302
		(4.9)	(-1.2)	
w	1983-84	0.043	-0.032	0.448
		(6.9)	(-3.4)	
w	1987-88	0.047	-0.055	0.466
		(6.6)	(-3.4)	
r	1980-81	-0.422	0.120	0.235
		(-4.1)	(1.3)	
r	1983-84	-0.182	0.126	0.063
		(-2.0)	(0.9)	
r	1987-88	0.009	0.074	0.026
		(0.3)	(1.2)	

w = wage rate; r = profit rate; K/L = capital-labour ratio;
ERP = effective rate of protection.

Note : For the equations estimated for 1987-88, the ERP estimates for 1989-90 have been used.

t- values in parentheses.

In the estimated equations for profit rate, the coefficient of ERP is found to be positive, as expected. The coefficients are, however, not statistically significant. In the estimated equations for wage rate, the coefficient of ERP is found to be negative. It is statistically significant at one per cent level in the estimates for 1983-84 and 1987-88. Thus, our results do not lend strong support to the hypothesis that tariff protection raised the income of primary factors of production in Indian Industries. While a positive relationship is found between ERP and profit rate, it is a weak one. On the other hand, a significant negative relationship is found between ERP and wage rate which contradicts our hypothesis.

Since there are no good reasons for a significant negative relationship to arise between ERP and wage rate, we have investigated this point further by using a different set of ERP estimates. We have re-estimated the wage rate equations replacing the ERP variable (based on our estimates) by a dummy variable reflecting the level of effective protection based on the information on effective protection rates provided in a study of the World Bank (1989)[9]. In the World Bank study, the industries have been classified according to rates of effective protection into three groups - high (over 70 per cent), medium (30 to 70 per cent) and low (below 30 per cent including negative). The estimates of the World Bank are for 1986-87. These are based on price comparisons and thus incorporate both tariff and non-tariff barriers (also tariff redundancy). The dummy variable has been assigned value one if the effective rate of protection is high or medium, and zero otherwise. The equations that we have estimated using this dummy variable (ERPD), reflecting level of effective protection, are shown below (t-value in parentheses):

For 1980-81

$$w = 6.89 + \underset{(3.74)}{0.040\ K/L} + \underset{(1.97)}{1.78\ ERPD}$$

$n = 60 \qquad R^2 = 0.34$

9. Due to difficulties in matching data, we have to leave out two industries.

For 1983-84

$$w = 10.24 + 0.029\ K/L + 3.21\ ERPD$$
$$\quad\quad (4.42) \quad (2.56)$$

$n = 60 \qquad R^2 = 0.41$

For 1987-88

$$w = 14.75 + 0.035\ K/L + 3.63\ ERPD$$
$$\quad\quad (5.16) \quad (1.94)$$

$n = 60 \qquad R^2 = 0.44$

The coefficient of K/L is positive and statistically significant as in the estimates presented in Table 3. It is interesting to note that the coefficient of the ERP dummy variable is positive and statistically significant. Thus, these results are different from those presented in Table 3.

Considering the above three estimated equations along with the results reported in Table 3, it seems to us that protection of domestic industries does have a favourable effect on the wage rate. However, high tariff may not lead to high wages if there is tariff redundancy. Thus, the agro-based industries enjoy high effective protection from the tariff system. But, the realised protection is much lower due to tariff redundancy (caused by competition among domestic firms) with the result that the wage rates in such industries are not relatively higher. Another point to be noted in this connection is that high tariffs are sometimes a reflection of low efficiency of the concerned industries (made-to-measure tariffs). In such a situation, a high tariff rate for an industry may be merely compensating for cost disadvantages and it may not make the industry capable of paying higher wages.

4.3 Capacity Utilisation

One disquieting feature of the Indian industry has been, and is, the existence of substantial unutilized production capacities in many branches of the industrial economy. Demand deficiencies, labour problems, transport bottlenecks and power shortages are

generally regarded as important causes of capacity underutilization. Capacity underutilization may be attributed also to market structure and the industrial and trade policies of the government.

Paul (1974) has investigated into the causes of capacity underutilization in Indian industries using multiple regression analysis. He used cross-sectional data for 39 industrial groups for the year 1965. He used six explanatory variables, namely market structure (number of firms), demand pressure, firm size, import penetration, effective rate of protection, and import content of production. A statistically significant relationship was found with each of these six variables. A positive relationship was found between demand pressure and capacity utilization and a negative relationship between ERP and capacity utilization. Capacity utilization was found to be inversely related to the number of firms in the industry and the degree of import penetration.

Goldar and Renganathan (1991) have carried out similar analysis for the year 1983-84 using cross-sectional data for 73 industries. They have used a dummy variable to reflect the level of effective protection, based on the information on ERP provided in a study of the World Bank (1989) (discussed earlier). The results of their study indicate that market concentration and demand pressure have significant positive effect on capacity utilization, which is in agreement with the findings of Paul (1974). ERP is found to have a negative coefficient as in the results of Paul; but the coefficient is statistically significant only at 10 per cent level.

The finding of a negative relationship between ERP and capacity utilization in the studies of Paul (1974) and Goldar and Renganathan (1991) lends support to the view that protection from foreign competition has an adverse effect on capacity utilization since the domestic firms are insulated from competitive pressures to utilize fully the resources available to them and reduce costs of production. It should be noted at the same time that Paul finds a significant negative relationship between import penetration ratio and capacity utilization, which indicates that intense import competition may prevent domestic firms from utilizing their production capacities fully. It may be inferred accordingly that protection from import competition has both a favourable effect and an unfavourable effect on capacity utilization. A high level of protection may cause underutilization of capacity since there would be no competitive pressure to utilize

resources efficiently. A low level of protection may, on the other hand, lead to import penetration and demand deficiency for domestic firms and make it difficult for them to utilize fully their production capacities.

For this study, we have estimated a multiple regression equation to explain inter-industry variation in capacity utilization using data for 110 industries (see Annexure II) for the year 1989-90. Rates of capacity utilization have been derived from DGTD sources. We have used three explanatory variables, namely demand pressure (measured by growth rate of production, 1985 to 1990), number of units in the industry (representing market structure) and tariff rate (for 1989-90). It is well known that capacity utilization rates derived from DGTD sources are not reliable. But, we are compelled to use this source as no other suitable alternative is available. Also, estimates of ERP not being available at such level of disaggregation, we have to use tariff rates (nominal protection) rather than ERP.

Regressing capacity utilization (CU) on demand pressure variable (DP), tariff rate (TR) and number of units in the industry (NU), we obtain the following equation (t-values in parentheses):

$$CU = 59.6 + \underset{(0.38)}{6.17\,DP} + \underset{(0.97)}{0.08\,TR} - \underset{(-0.87)}{0.07\,NU}$$

$$n = 110 \qquad R^2 = 0.019$$

The coefficients of DP and NU are of the expected sign and in this regard our results are similar to the results of Paul (1974) and Goldar and Renganathan (1991). On the other hand, the coefficient of TR is positive and this is at variance with the findings of those studies. It should be noted that all three coefficients are statistically insignificant. Also, the overall explanatory power of the model, as indicated by R^2, is low. This is partly due to errors in the measurement of capacity utilization (due to poor quality of data on production capacity); but it basically shows that certain important determinants of capacity utilization have not been included in the regression equation (which we could not do as the required data were not readily available).

The simple correlation coefficient between capacity utilization and tariff rate is found to be 0.1. However, for 38 industries (out of the 110) engaged in the manufacture of engineering products, the correlation coefficient is found to be -0.2. Similarly, for 33 industries producing chemical products, the correlation coefficient is found to be -0.1. All these coefficients of correlation are statistically insignificant. But, the differences in the signs of correlation coefficients imply that the results of multiple regression presented above may have been affected by heterogeneity among industries.

Due to inadequacies of data, the results of our empirical analysis in respect of capacity utilization are not very satisfactory. More careful research on this aspect is needed. However, if we go by whatever results we have obtained then it may be inferred that high tariff protection was not generally associated with very low rates of capacity utilization.

The studies of Paul, and Goldar and Renganathan have lent empirical support to the hypothesis that high rates of protection may adversely affect capacity utilization in domestic industry. Our empirical results do not reject this hypothesis. However, it seems to us that for Indian industries in which capacity utilization was very low, high tariff protection was generally not a major factor responsible for capacity underutilization; there were possibly other causes like demand deficiency, power shortage and inadequate availability of some crucial inputs.

4.4 Export Performance

As discussed in Section 3, several earlier studies have noted that Indian foreign trade regime has created a significant bias against exports. Empirical evidence has been presented to show that the rate of effective protection to exports is much lower than that to domestic sales and that domestic profitability is significantly higher than export profitability even when export incentives are taken into account.

A comparison of ERP and the rates of net export incentives presented in Table 4 lends support to this assertion.

Table 4: ERP and Export Incentive Rates

Product	ERP	Rate of Export Incentive	
	1989-90	1987-88	1988-89
Cotton textiles	149.9	22.7	28.1
Leather & leather products	157.0	20.8	23.7
Chemical items	143.3	29.6	29.7
Engineering items	96.2	42.4	43.5
Rayon fabric/ synthetic garments	166.3	56.1	58.8
Woolen textiles,hosiery	108.7	17.2	37.8
Plastic goods	159.3	31.4	35.8

The export incentive rates are based on a recent study carried out at the National Institute of Public Finance and Policy.[10] In that study, export incentive rates have been provided for the years 1984-85 to 1988-89. For computing the export incentive rates, cash compensatory support, duty drawback, premium on REP licenses, interest subsidy on credit for exports, tax subsidy on export profit and international price reimbursement schemes on steel and aluminium products have been taken into account. The incentive rates have been computed as ratio to domestic value added i.e. netting out requirements of imported intermediate inputs. The incentive rates are shown in the table for seven major export categories for 1987-88 and 1988-89. Average ERP for these categories of products are shown in the table for the year 1989-90 (as we do not have estimates for 1987-88 or 1988-89).

The rate of export incentive is not the same as the rate of effective protection to export activity. However, considering the fact that the rates have been computed as ratio to domestic value added, one would expect the ERP for export activity to be not much higher than the export incentive rates presented in the table. It is seen, that ERP estimates made by us (which are for domestic sales) are much larger than the corresponding export incentive rates. Accordingly, it may be inferred that effective protection provided to domestic sales by the tariff system is not matched by the export incentives so that a bias is created against export activity. From the figures presented in Table 4, it seems that the bias is relatively less in the case of engineering products.

Given that the tariff system has created a significant bias against exports, one would expect export performance to be relatively inferior in those industries in which the level of effective protection to domestic sales is relatively high. Accordingly, an inverse relationship may be expected between ERP and export performance of different industries.

10. See Pradhan, G., 1992.

We have computed the correlation coefficient between export-intensity (ratio of exports to domestic production) and ERP. For 1983-84, we get such data for all the 66 input-output sectors engaged in manufacturing. The correlation coefficient is found to be -0.19. Though statistically insignificant, the finding of a negative correlation between ERP and export intensity is consistent with the hypothesis that protection affects export performance adversely. When some of the traditional exporting industries, such as textiles, leather and leather products, tea and coffee, and non-metallic mineral products (gems), are excluded, the correlation coefficient declines in value, but it still remains negative at -0.14 (59 observations).

In this context, it is important to study the growth rate of exports and relate it to ERP. Using input-output tables for 1979-80 and 1989-90, we have computed growth rate of exports for 28 sectors engaged in manufacturing. The correlation coefficient between growth rate of exports (1979-80 to 1989-90) and average ERP (for 1980-81, 1983-84 and 1989-90) is found to be 0.1. And, for 16 sectors (out of 28) engaged in manufacture of chemical products, rubber products, plastic products, metal products, machinery and transport equipment, the correlation coefficient is found to be 0.32. Thus, we find a positive relationship between export growth and protection, rather than a negative one.

Estimates of ERP presented in Part II of the study indicated that the level of effective protection was higher for chemicals than that for engineering. Yet, a study of export trends during the 1980s brings out that the growth of exports of chemical items has been much faster than that of engineering products. Exports of engineering products increased from Rs.874 crore in 1980-81 to Rs.2350 crore in 1989-90 (at the rate of 11.6 per cent per annum). During the same period, exports of chemical items increased from Rs. 235 crore to Rs. 2158 crore (at the rate of 27.9 per cent per annum).

Table 5 shows India's exports of some chemical and engineering items in 1980 and 1989. It is seen from the table that in organic chemicals and dying, tanning and colouring materials there has been a large increase in exports. For both the industries, the ERP has been quite high. Similarly, exports of artificial resins and plastic materials have

grown rapidly and this industry has also enjoyed high effective protection. On the other hand, the level of protection has been relatively lower for medicinal and pharmaceutical products, and exports of these items did not grow between 1980 and 1989.

Among the engineering items, there has been a rapid growth of exports of office machinery and ADP equipment, and telecommunication and sound recording and reproducing equipment. The ERP for these industries has been high. By contrast, the level of effective protection has been relatively lower for power generating machinery and equipment, metal working machinery and electrical industrial machinery; but exports of these items have grown between 1980 and 1989. Effective protection to electronics industry has been high and so has been the rate of growth of exports of electronic items.

Table 5: India's Exports, Selected Items, 1980 and 1989

($ mn)

Item	1980	1989
Organic chemicals	17	192
Inorganic chemicals	26	38
Dying, tanning and colouring materials	65	165
Medicinal & pharmaceutical products	109	103
Essential oils and perfume materials	86	65
Artificial resins, plastic materials	3	17
Power generating machinery & equipment	88	84
Machinery specialized for particular industries	65	85
Metal working machinery	32	22
General industrial machinery	67	127
Office machinery & ADP equipment	2	69
Telecommunication, sound recording and reproducing equipment	11	20
Electrical machinery	114	90
Road vehicles	208	143
Other transport equipment	32	4

Source : Economic Survey, 1992-93

It is evident from the above that many of the industries which achieved rapid growth of exports in the 1980s enjoyed high rates of effective protection on their domestic sales. Thus, these industries could achieve rapid export growth despite the significant anti-export bias created by the tariff system. The industries for which the ERP was relatively lower and the anti-export bias relatively less did not in general attain faster growth in exports than the industries for which the ERP was relatively high.

How do we explain the observed positive association between high rates of protection to domestic sales and high rates of growth of exports? In a static framework, high protection to domestic sales obviously goes against exports. In a dynamic setting, however, this need not be so, since the issues of learning, economies of scale etc. become important. It seems to us that high protection may enable the domestic industry to grow rapidly and attain maturity, and this may enable the domestic industry to enter successfully in international markets.

Conclusion

In Parts I and II of the study, we had examined the nominal and effective rates of protection accorded to Indian industries by the tariff system. This part of the study was concerned with the effects of tariff on domestic industries. We discussed some theoretical issues regarding the effect of tariff on domestic industrial production. We presented a brief review of the available literature of the effect of protection on the performance of Indian industries. Finally, we presented the results of our empirical analysis.

Based on the theoretical discussion, it was concluded that tariff should increase domestic production, though in certain circumstances it may not do so. Even if tariff succeeds in raising domestic production there is a welfare cost arising from misallocation of resources and x-inefficiency.

In the literature on India's trade policy regime, it has been recognised that while protection has succeeded in creating a large and highly diversified industrial base, it has led to inefficiency in the use of resources. The inefficiencies have taken various forms: inefficient allocation of resources among industries, rent-seeking, x-inefficiency, and lack of technological dynamism. Other important conclusions reached in earlier studies are: (1) tariff on capital goods and key intermediates have led to widespread cost escalation, and (2) the foreign trade regime has created a significant bias against exports.

In our empirical analysis we considered four aspects of industrial performance, namely growth, factor remuneration, capacity utilization and exports. The main findings of our analysis are as follows:

(1) The industries enjoying higher protection do not exhibit significantly better growth performance. Thus, there are other more important factors influencing growth of industries.

(2) Protection has a significant favourable effect on wage rate. However, higher rates of tariff may not lead to higher wages, since competition among domestic firms may keep the realised protection low (even though the available protection goes up).

(3) Some studies have found a significant negative relationship between protection and capacity utilization. The results of our analysis, however, do not reveal any significant negative relationship between tariff rate and capacity utilization. Thus, for the industries in which capacity utilization is very low, tariff protection cannot be held a major factor responsible for underutilization of capacity.

(4) Comparison of effective rates of protection and net export incentive rates lends support to the assertion that the tariff system has created a significant bias against exports. However, we also find that many of the industries which achieved high rates of growth of exports during

the 1980s enjoyed relatively higher effective rates of protection to domestic sales. Thus, high export growth was achieved despite anti-export bias. This is possibly a consequence of the favourable effect of tariff on growth, and the favourable effect of growth on export performance.

Annexure 1

Average Effective Rates of Protection and Growth of Production in the Eighties

S.No.	IO Code	Sectors	ERP Avg.of 1980-81, 1983-84, 1989-90	Gr.rate o Productio (1980-88
1	33	Sugar	104.41	8.
2	35	Hydrogenated oil	119.63	3.
3	37	Tea & Coffee processing	138.12	13.
4	38	Miscellaneous food products	216.36	30.
5	39	Beverages	228.53	6.
6	40	Tobacco products	130.75	-3.
7	42	Cotton textiles	154.65	16.
8	49	Miscellaneous textile products	144.24	9.
9	54	Leather footwear	141.56	13.
10	55	Leather products excluding footwear	I36.24	5.
11	56	Rubbber products	135.25	17.
12	57	Plastic products	139.03	13.
13	58	Petroleum products	273.22	9.
14	59	Coal tar products	57.17	-1.
15	60	Inorganic heavy chemicals	94.67	6.
16	62	Fertilisers	12.27	12.
17	64	Paints, Varnishes & Lacquers	162.88	0.
18	65	Drugs & Medicines	85.97	15.
19	66	Soaps,Cosmetics & Glycerine	137.48	6.
20	67	Synthetic fibres,Resin	140.43	11.
21	68	Other chemicals	99.38	25.
22	70	Cement	82.03	17.
23	71	Other Non-metallic mineral products	106.00	1.
24	72	Iron & Steel & Ferro-alloys	102.34	11.
25	73	Iron & Steel casting & forging	166.04	2.
26	75	Non-ferrous basic metals	102.70	18.
27	76	Hand tools,hardware	98.11	7.
28	77	Miscellaneous metal products	120.80	11.
29	78	Tractors & other Agricultural machinery	24.57	2.
30	79	Food & Textile industrial machinery	47.67	-0.
31	80	Industrial machinery(except Food & Textile)	63.69	-0.
32	81	Machine tools	32.88	3.
33	82	Office computing & Accounting machinery	103.88	-0.
34	83	Other Non-electrical machinery	58.36	34.
35	84	Electrical industrial machinery	77.23	1.
36	85	Electrical cables,wires	108.71	-3.
37	86	Batteries	146.26	8.
38	87	Electrical appliances	88.85	4.
39	88	Communication equipment	138.79	21.
40	89	Other Electrical machinery	70.94	-0.
41	90	Electronic equipment & T.V.	95.92	25.
42	91	Ships & Boats	34.37	-1.
43	92	Rail equipment	49.90	10.
44	93	Motor vehicles	102.84	8.
45	94	Motor cycles & Scooters	97.27	-14.
46	95	Bicycles,Cycle-rickshaws	91.74	6.
47	96	Other Transport equipment	129.17	9.
48	98	Miscellaneous manufacturing	85.09	28.

Source :Goldar and Saleem (1991) ,Statistical Abstract 1990

Annexure 2

Tariff Rate and Capacity Utilisation :CSO industries

S.No	CSO Industry name	No of units	Capacity Utilisation 90	Growth Rate 1985-90	Tariff Rate 1989-90
1	Power Dist Transfmrs. including special transfmrs.	31	100.77	7.78	91.40
2	Motor Starters And Contractors	30	64.34	6.51	92.50
3	Power Capacitors	14	137.18	18.24	75.00
4	T. V. Receivers	55	56.23	13.69	145.00
5	Teleprinters	2	58.65	1.52	153.50
6	Plastic Film Capacitors	17	57.25	13.65	145.00
7	Electrolytic Capacitors	19	121.73	16.57	145.00
8	Cranes	43	35.50	0.28	90.50
9	Ship Building (Including shiprepairs)	22	78.53	5.42	85.00
10	Commercial Vehicles	20	66.29	5.28	195.00
11	Passenger Cars	5	103.37	14.83	132.10
12	Tungsten Carbide Tipped Tools	12	52.08	-16.42	105.00
13	Forged Hand Tools	11	44.42	1.02	105.00
14	Cutting Tools (Lathe Tools, Tool bits, Milling)	37	51.55	19.68	40.00
15	Pipes & Tubes (other than Spun Pipes)	105	31.00	1.91	115.00
16	Wire Ropes	17	105.76	7.81	115.00
17	Bolts & Nuts	28	70.13	15.67	115.00
18	Ball & Roller & Needle Bearings	26	94.59	12.26	195.00
19	Spun Pipes	10	29.72	0.05	115.00
20	Copper Metal (cathode)	2	81.62	6.71	107.50
21	Copper Alloy Rolled Products	26	58.82	34.17	117.00
22	Type-Writers	9	80.71	0.16	105.00
23	Bicycles of all kind	11	92.64	3.66	145.00
24	Storage Batteries	11	101.80	10.67	145.00
25	Dry Cells	21	53.00	-0.31	145.00
26	Electric Fans of all kinds	18	86.44	-3.72	105.50
27	G. L. S. Lamps	20	88.92	-0.07	105.00
28	Fluorescent Tubes	20	77.07	7.86	140.00
29	Wrist Watches	17	92.59	-37.05	145.00
30	Alarm Time Peices	9	77.11	-17.94	145.00
31	Razor Blades	93	115.75	-0.46	145.00
32	L. P. G. Cylinders	45	25.53	20.19	117.30
33	Boilers	26	65.53	8.97	117.30
34	Chemical Machinery	92	62.63	15.17	69.30
35	Mining Machinery	31	157.39	15.01	85.00
36	Cement Machinery	19	20.94	-17.58	80.00
37	Power Driven Pumps	63	54.41	-47.20	105.50
38	Air and Gas Compressors	16	59.76	4.84	105.50
39	Weighing Machines	11	58.77	15.28	108.50
40	Refrigerators (Domestic)	5	93.97	13.14	115.00
41	Water Coolers	9	81.55	3.89	93.70
42	DMT	3	19.78	30.37	132.00
43	Phthalic Unhydride	8	106.90	2.44	132.00
44	Linear Alkyle Benzene	2	114.41	24.80	81.00
45	Methanol	7	78.75	17.61	125.10
46	Phenol	6	74.11	19.56	85.00

S.No	CSO Industry name	No of units	Capacity Utilisation 90	Growth Rate 1985-90	Tariff Rate 1989-90
49	Benzene	6	92.66	-7.67	81.00
50	Acetic Acid	18	91.93	-3.41	119.70
51	Butyle Alcohol	4	83.67	-7.43	125.10
52	Acetic Anhydride	9	68.14	11.47	119.70
53	Camphor	4	89.00	41.14	111.00
54	Geraniol	5	3.54	6.41	125.10
55	Turpenool	4	212.57	-6.62	115.00
56	Cement All Kinds	175	77.81	7.63	105.00
57	Plywood Commercial	64	61.33	-3.82	105.00
58	Pulp Rayon Grade	5	88.83	-0.56	99.00
59	Newsprint Bleached	4	102.14	2.08	145.00
60	Matches	5	83.58	0.61	105.00
61	Caustic Soda	40	84.72	-51.50	227.50
62	Soda Ash	7	95.42	-43.76	85.00
63	Sulphuric Acid	123	44.67	1.63	115.00
64	Calcium Carbide	9	42.83	6.13	115.00
65	Alumina Ferric	17	34.02	-10.11	85.00
66	Chlorine	29	56.96	-44.34	85.00
67	Calcium Carbonate	11	69.97	2.48	115.00
68	Sodium Hydro Sulphite	8	51.57	5.33	115.00
69	Potassium Chlorate	18	31.96	-2.50	115.00
70	Rubber Chemicals	6	59.80	5.02	145.00
71	Bicyle Tyres	17	63.48	-5.69	145.00
72	Rubber Footwear	17	64.74	-2.24	145.00
73	Contraceptives	4	87.49	-32.69	145.00
74	Rubber Hoses (other type)	18	75.79	55.08	145.00
75	PVC Pipes & Tubings	13	56.80	-3.84	145.00
76	Laminates / Decoratives	20	65.80	-1.78	146.20
77	L. D. P. E.	3	73.42	49.37	145.00
78	H. D. P. E.	1	68.20	-2.43	145.00
79	Poly Propelene	1	49.78	2.03	145.00
80	P. F. Moulding Powder	2	63.57	-3.25	145.00
81	U. F. Moulding Powder	5	35.48	25.97	145.00
82	Viscose Tyre Cord	3	42.96	3.28	145.00
83	Viscose Staple Fibre	4	123.03	10.41	100.00
84	Cellulose Film	2	73.83	9.19	125.00
85	Nylon Filament Yarn	11	68.00	-3.38	199.10
86	Nylon Tyre Cord	8	137.12	11.53	199.10
87	Acrylic Fibre	3	63.61	5.63	166.50
88	Polyster Filament Yarn	20	180.14	19.77	199.10
89	Soaps All Kind	58	83.11	2.44	155.00
90	Detergents All Kind	23	58.79	4.75	155.00

S.No	CSO Industry name	No of units	Capacity Utilisation 90	Growth Rate 1985-90	Tariff Rate 1989-90
91	Fatty Acids	25	72.62	22.13	173.30
92	Glycerine	22	69.39	12.40	105.00
93	Toothpowder	8	53.22	-10.68	155.00
94	Pencils	2	9.53	-4.26	145.00
95	Industrial Explosives (N. G. Type)	23	48.06	3.13	105.00
96	Detonators	4	63.17	-0.05	105.00
97	Safety Fuses	2	30.06	-11.92	105.00
98	Detonating Fuses	7	89.45	25.81	105.00
99	Gaur Gum	8	26.24	-18.50	81.66
100	Biscuits	35	116.50	6.30	145.00
101	Malted Food	6	134.20	-8.80	105.00
102	Chocolate	9	79.64	7.65	145.00
103	Glue	3	49.47	4.81	105.00
104	Gelatine	5	68.35	1.68	105.00
105	Titanium Dioxide	2	44.49	1.84	195.00
106	Lead Oxide	3	56.30	0.39	195.00
107	Paints , Enamel & Varnishes	26	55.52	1.59	195.00
108	N. C. Lacquers	4	79.17	-5.18	195.00
109	Oxygen	217	81.00	1.93	111.36
110	D. A. Gases	123	48.93	56.10	111.36

Source :(1) DGTD Report 1985-86 and 1990,Go
(2) Customs Tariff Manual 1989

REFERENCES

Ahluwalia, I.J.(1991), Productivity and Growth in Indian Manufacturing,Delhi Oxford University Press.

Aksoy,M.A.(1991),'The Indian Trade Regime', Policy Research Working Paper No.989, The World Bank.

Aksoy, M.A. & F.M.Ettori (1992), 'Protection and Industrial Structure in India', Policy Research Working Paper No. 990, October, The World Bank.

Baldwin,R.E. (1982). The inefficacy of trade policy. Essays in International Finance, No.150. International Finance Section, Department of Economics, Princeton University.

Baldwin,R.E. and R.K.Green. (1988): 'The Effects of Protection on Domestic Output'. in Baldwin ,R.E(ed.). Trade Policy Issues and Empirical Analysis.

Bhagwati,J.N. and B. Hansen. (1973) 'A theoretical analysis of smuggling'. Quarterly Journal of Economics 87: 172-87.

Bhagwati,J.N. and T.N. Srinivasan, (1975). Foreign Trade Regimes and Economic Development: India, NBER, New York.

Boadway,R and J.Treddenick(1978) , A General Equilibrium computation of the effects of the Canadian tariff structure. The Canadian Journal of Economics,11,424-46.

Dixon,P.B. et al (1977) ORANI, A General Equilibrium Model of the Australian Economy,First Progress Report of the Impact Project,Vol.2.Canberra.Australian Government Publishing Service.

Chan,K. (1978), 'The Employment Effects of Tariff under a Free Exchange Rate Regime', Journal of International Economics, Vol.8, p 415-29.

Ettori,F.M. (1990), 'The Perverse Effect of High Taxation of Capital Goods in India' PRE Working Paper 433, World Bank.

Ford,J.L. and S.Sen, (1985): Protectionism, Exchange Rates and the Macroeconomy, Basil Blackwell, Oxford.

Goldar,B.(1986) Productivity Growth in Indian Industry. Allied Publishers.

Goldar,B.(1986a),Import Substitution,Industrial Concentration and Productivity Growth in Indian Manufacturing, Oxford Bulletin Of Economics and Statistics,May.

Goldar,B.and V.S.Renganathan, (1990) Liberalisation of Capital Goods Imports,Working Paper,National Institute of Public Finance and Policy.

Goldar,B and V.S.Renganathan, (1991). 'Capacity Utilization in Indian Industries' , Indian Economic Journal.

ICICI (1985), Export Performance of ICICI Financed Companies, 1978-79 to 1980-81.

Kaldor,N. (1970): 'The case for regional policies', Scottish Journal of Political Economy, 17: 337-48.

Kaldor,N. (1982): Limitations of "General Theory"', Proceedings of the British Academy, 68.

Kitson,M. and S.Solomou, (1990): Protectionism and Economic Revival: - The British Interwar Economy, Cambridge University Press.

Krugman,P.(1982), "The Macroeconomics of Protection with a Floating Exchange Rate", Carnegie-Rochester Conference Series on Public Policy, 16: p 141-82, North Holland, Amsterdam.

Metzler (1949): 'Tariffs, the terms of trade, and the distribution of national income', Journal of Political Economy, 62: 1-29.

Mitra,P.(1990), "Tarifff Design and Reform in a Revenue-Constrained Economy: Theory and an Illustration from India" Paper presented at the Conference on Public Finance and Planning organized by the International Seminar on Public Economics and the National Institute of Public Finance and Policy, New Delhi, Jan 11-13.

Mitra,P. and D.Go (1992), 'Trade Liberalization, Fiscal Adjustment and Exchange Rate Policy:' A methodological illustration using Indian Data, World Bank, Forthcoming, discussed in Aksoy and Ettori (1992).

Mundell,R.A. (1961),"Flexible Exchange Rates and Employment Policy", Canadian Journal of Economics, Vol 2-7, p 509-17.

Panchamukhi,V.R.(1978) Trade Policies of India -A Quantitative Analysis,Concept Publishing Company.

Paul,S. (1979), 'Industrial Performance and Government Controls', in J.C. Sandesara (ed.), The Indian Economy Performance and Prospects, Bombay,University of Bombay.

Pradhan,G.(1992), Incentives for exports in India:An evaluation,NIPFP.

Venkataramanan,P.R. (1987), Import Tariffs and Protection to Domestic industry in India, M.Sc. Dissertation, University of Bath.

World Bank (1989), India: An Industrializing Economy in Transition. A World Bank Country Study.