

Pakistan's Experience with Manufacturing of Components for Consumer Durables†

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I. INTRODUCTION

The experience of developed countries suggests that the capital-goods industries are transmitters of technological change and are instrumental in diffusing innovations throughout the economy.¹ Pakistan's manufacturing industries have largely been confined to consumer goods industries, such as food and textiles, which require simple technology. Industries such as machinery, automobiles, consumer durables and basic chemicals which require sophisticated technology were virtually non-existent till the Seventies.² However, output of machinery, automobiles and consumer durables registered a sharp increase during the Eighties.

Capital-goods industries may be initiated/promoted through any of three routes: evolutionary, policy-induced and vehicle assembly.³ The evolutionary method to initiate capital goods production is through the formation of skilled manpower through a gradual process starting with repairs and maintenance. The policy-induced method of developing the capital goods industries takes the form of creating skilled manpower through deliberate government policy. The vehicle assembly based capital goods production minimises initial skill requirements but helps in developing the skills by creating demand for components and, hence, for the skilled manpower through on-the-job-training.

Due to the lack of the necessary skilled people Pakistan has initiated the process of developing the capital-goods industries through vehicle assembly in the early Eighties by encouraging assembly of automobiles, consumer durables and capital-goods industries.⁴ These industries are encouraged by allowing concessional rates of duty ranging between zero and 60 percent⁵ on the import of components as

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¹For role of capital-goods industries in spread of technology see Rosenberg (1976).

²Even though machinery and automobiles accounted for about 9 percent of total manufacturing output in 1980-81, they largely consisted of traditional goods such as agricultural implements, cycles etc.

³For details see Chundovsky, Nago and Jacobsson. (1983).

⁴For details of the industries see Government of Pakistan (1985).

⁵Most of the components can be imported at concessional rate of 30 percent import duty.

compared to an average rate of about 100 percent import duties on the finished goods. These incentives have been provided in the hope that over a period of five years almost three-fourths of the components would be produced in the country.

The indigenization programme approved by the government along with industrial sanction is called the 'Deletion Programme' in Pakistan.⁶ Since industrial sanctions depend upon the undertaking of a high level of indigenization, very ambitious 'deletion programmes' have been formulated. However, implementation of these programmes, as shall be shown later, has been rather disappointing. The capital-goods industries have mainly been confined to assembly and even where some indigenous components/spare parts have been used, they were already in production.⁷

The main objective of the paper is to review the vehicle assembly based development of capital-goods industries in Pakistan. Since the indigenization of machinery sectors is not being closely monitored and data are not available, the analysis presented in this study is confined to automobiles and consumer durables only. The paper has five sections: The Structure of Manufacturing Industries is examined in Section II. Deletion Policy, Programmes and Achievements are examined in Section III. The factors governing a firm's decision to produce or purchase a component from a domestic vendor instead of importing are analysed in Section IV. The final section presents a summary of the findings.

II. STRUCTURE OF MANUFACTURING INDUSTRIES OF PAKISTAN

While the large-scale manufacturing sector accounts for about 13 percent of the output almost two-fifths of manufacturing output is accounted for by the food and textiles industries. The share of electrical and non-electrical machinery and automobile industries in value added originating in the large-scale manufacturing sector until 1980-81 stagnated at very low levels. Their share was 8.2, 8.1 and 9.1 percent in 1959-60, 1969-70 and 1980-81 respectively. However, mainly because of a sharp increase in the production of motor vehicles, batteries, metal fabrication and textile machinery, their share in large-scale manufacturing value added increased to 16.3 percent in 1983-84.⁸

The growth of capital-goods industries was constrained by the fact that they were being penalized in the sense that the incidence of import duties on inputs

⁶It is called deletion programme because the components which are manufactured in the country are deleted from the list of components which enjoy concessionary rate of duty.

⁷Sometimes the industrialists did not use even the parts already being manufactured in the country e.g., indigenous tyres and batteries were not used by the Automobiles industry.

⁸The last Census Manufacturing relates to 1983-84. The share of these sectors and consumer durables must have increased further because of heavy investment in these sectors over last few years.

exceeded the nominal protection enjoyed by the industry in the early Eighties.⁹ As soon as incentives for the assembly of capital goods were created in the form of very low concessional duties on the import of components and raw materials both the investment as well as output of these industries increased at a very rapid rate.

Assembly operations, no doubt, created demand for the components, but due to the low protection enjoyed by the manufacture of components, the production of components remained low. It seems that while government was aware of the low profits in manufacturing of components it resorted to administrative measures instead of rationalizing the tariff structure to improve the profitability of producing components. The sponsors were asked to submit a deletion programme i.e. indigenization programme, outlining the extent of indigenization to be achieved over five years and its phasing over time. In case the sponsor failed to adhere to the deletion programme, he could be penalized the penalty could take the form of withdrawing the concession on import duties on components and raw materials and refusal to grant expansion of the assembly activities.¹⁰

III. DELETION POLICY, PROGRAMMES AND ACHIEVEMENTS

In order to encourage assembly-cum-manufacture, the government provided incentives to assembly through lower import duties on components only against an approved 'deletion' programme.¹¹ These programmes are analysed before reviewing the deletion policy which underwent major changes in 1987. Deletion programmes and the achievement shown in Table 1, bring out the fact that the deletion programme in most of the cases have been quite ambitious and unrealistic. For example, with a capacity to manufacture only ten to fifteen thousand cars per annum, it is wishful thinking to start producing 84 percent of the parts in the country by the fifth year of operation. Whereas targets for indigenization had been very high, performance, except in the case of tractors, has been very disappointing. Moreover, both the indigenization targets and realisations vary significantly across different firms within an industry. For example, deletion achieved ranges between 19.9 percent and 64.9 percent in case of tractors and between 10.8 percent and 65 percent in case of buses.

Deletion programmes have been drawn in terms of the percentage of completely built units (CBU) rather than as the percentage of completely knocked down

⁹See, Naqvi and Kemal (1983).

¹⁰In the new policy on 'deletion', there are no capacity constraints on the expansion assembly operations.

¹¹Ministry of Industries monitors programmes relating to automobiles and consumer durables. Central Board of Revenue also had a deletion programme; any firm agreeing to 'delete' 75 percent parts over a five-year period was granted tax concession irrespective of the deletion programme approved by Ministry of Industries.

Table 1
Deletion Programmes and Achievements

		Targets		Achievements
I. Trucks		1988	1991	1988
Firm 1		40.9	81.2	17.3
Firm 2		38.2	82.0	27.0
Firm 3		36.7	81.3	18.2
Firm 4		71.5	74.2	53.9
II. Buses		1988	1991	1988
Firm 1		40.9	81.2	17.3
Firm 2		38.2	82.0	23.4
Firm 3		51.4	74.9	32.0
Firm 4		37.7	75.1	22.9
III. Cars, Vans, Pickups and Jeeps		1987	1989	1987
Cars		53.5	80.8	31.2
Vans		55.3	73.9	23.4
Pickups		57.4	82.9	31.1
Jeeps		55.0	81.0	45.8
IV. Tractors		1985	1987-88	1986
Firm 1, Model A		64.7	81.8	66.3
Firm 1, Model B		19.9	53.6	20.0
Firm 2, Model A		59.9	82.4	47.3
Firm 2, Model B		25.2	60.8	36.1
Firm 3		60.8	87.1	48.5
Firm 4		52.6	72.0	46.4
Firm 5, Model A		64.9	85.6	49.8
Firm 5, Model B		62.9	85.6	47.8
V. Two and Three Wheelers		1985	1989	1987
Motorcycles		73.6	73.6	50.6
Scooters		75.0	75.0	57.6
Scooter Ricshaws		52.8	62.0	58.9

Table 1 - (Continued)

VI. T.V. (Black and White)	1987	1987
Firm 1	50	38.8
Firm 2	50	43.3
Firm 3	50	41.0
Firm 4	50	28.0
Firm 5	50	37.0
Firm 6	50	44.0
Firm 7	50	41.0
T.V. (Coloured)		
Firm 1	40	20.0
Firm 2	40	19.0
Firm 3	40	11.0
Firm 4	40	16.0
Firm 5	40	27.0
Firm 6	40	12.0
Firm 7	40	0.0
VII. Refrigerators	65	N.A.
VIII. Air-conditioners	65	N.A.
IX. Deep-freezers	65	N.A.

Source: Ministry of Industries.

(CKD) units, i.e. total components forming total kit. This exaggerates the indigenization of components. Besides components which hardly involve any sophisticated technology and which are already being produced in the country, are also counted towards deletion. The distinction is important because CBU also contains cost of assembly and body manufacturing and as such linking the percentage to CBU exaggerates the deletion levels realized. For example, in the case of refrigerators, air-conditioners and deep-freezers, the indigenization target of 65 percent, which looks rather high, consists of body assembly and components such as plastic and rubber parts, metal parts, cabinet parts and electrical parts. While the crucial and basic parts such as compressors, thermostat controls, overload relay, evaporators, gasket/capacitor and copper tubing are neither being produced in the country nor are part of the deletion programme. Moreover, the coverage of indigenization programmes has been restricted to the manufacturing of components for the industry: it ignores backward linkages.

The failure of the indigenization programmes led the government to review the 'Deletion Policy' which consequently underwent major changes in 1987. The salient features of the present 'Deletion' policy are detailed in Kemal (1989). While the new policy is an improvement over the earlier policy in the sense that heavier penalties have been imposed through withdrawal of total/partial concessions in import duties on components rather than through capacity constraints, and a cell has been created to draw realistic deletion plans and monitor them, it still relies on penalties for defaulters instead of rewards for indigenization. It needs to be underscored that defaulters would always find an excuse for their failure to avoid penalties. The past experience suggests that the sponsors have always been successful in extending the deadlines for deletion without any penalty. Therefore, sponsors rightly feel that the probability of penalties being imposed is low.

IV. DETERMINANTS OF DOMESTIC MANUFACTURING OF COMPONENTS

The decision to produce or purchase a component from a domestic vendor instead of importing it depends upon whether the domestic production of components would raise or lower the profits. The decision is also constrained by the technical agreements to transfer technology by the sponsors to produce the component and the effect of domestic component production on the profits of the foreign collaborator. Therefore, we have to analyse the behaviour of both the domestic incorporated firm and the foreign collaborator.

Profits (Π) of the domestic incorporated firm are:

$$\Pi = P^d - \sum_{i=1}^n P_i^d a_i \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

where:

P^d is domestic price of output;

a_i is the i th input required to produce one unit of output, where the first k inputs are domestic while the remaining $n-k$ inputs are imported; and

P_i^d is domestic market price of an indigenous input when $i = 1, \dots, k$ and to landed cost of an imported input when it refers to last $n-k$ inputs.

Price of output is set by the firm at a point which maximises his profits. However, the domestic price would be no higher than the landed cost.

$$P^d < P^w(1 + t) \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

where

P^w is c & f value of output.

Whether an input will be produced in the country or not depends upon whether the domestic activity is sufficiently protected to offset cost disadvantages or not, i.e.

$$c_i^d < P_i^w (1 + t_i) \quad \dots \quad \dots \quad \dots \quad \dots \quad (3)$$

$$c_i^d \leq P_i^d \quad \dots \quad \dots \quad \dots \quad \dots \quad (4)$$

The domestic cost of producing an additional component is governed by the extent of indigenization already accomplished in the country, tariffs on raw materials and volume of production, i.e.

$$c_i^d = c_i^d(D, t_p, Y) \quad \dots \quad \dots \quad \dots \quad \dots \quad (5)$$

where:

D is the cumulative idigenization realised in the industry;

t_p is the tariff on raw materials used in the production of i th component; and

Y is volume of output.

and

$$\frac{\partial c_i^d}{\partial D} > 0 \quad \frac{\partial c_i^d}{\partial t_p} > 0 \quad \frac{\partial c_i^d}{\partial Y} < 0; \quad \dots \quad \dots \quad \dots \quad (6)$$

It becomes increasingly difficult to indigenize after a certain level of indigenization has been achieved because of the complexity and the sophistication of technology required to produce the remaining components. Since technology transfer is difficult and costly, the ratio of costs of production to c. & f. value increases more sharply as cumulative indigenization increases. The positive relationship between cost and tariff on inputs is obvious. Finally, scale economies in the production of components suggest a negative relationship between costs and magnitude of output.

Substituting Equations (5) and (3) into Equation (4) gives us.

$$c_i^d(D, t_p, Y) \leq P_i^d \leq P_i^w (1 + t_i) \quad \dots \quad \dots \quad \dots \quad (7)$$

The relationship shows that the differential rates of tariffs on components and raw materials may or may not be sufficient to offset cost disadvantages in the production of a component at very low volumes of output. This relationship would determine the size of k in Equation 1.

Since the size of market, particularly in the initial stages, is limited and skilled manpower is also in short supply the cost of production is expected to be significant-

ly higher than the c. & f. value. For example, Pratten (1971) has estimated that the minimum efficient size of a car plant ranges between 100,000 to 250,000 whereas the size of the plant in Pakistan has been around 15,000. In countries like Thailand, with the market around 65,000, the penalty costs¹² for radiators, starters, regulators and wiper sets were 60, 175, 146 and 180 percent respectively. In case of Malaysia the penalty costs for shock absorber and filter element were 93 and 152 percent respectively.¹³ Therefore, mere exemption from duty on raw materials would be inadequate to encourage domestic production unless the statutory rates of duty are imposed on the import component.

When a duopolistic or oligopolistic structure of the market prevails, which is the case in almost all the consumer durables in Pakistan, the firm's decision to indigenize is influenced by the rival firm's decision to indigenize. If a part/component is indigenized by any firm in an industry, the concessional duty on import of that component is withdrawn from all the firms. Accordingly, the indigenization may be conceived as a non-zero sum game with the following pay-offs.

	Indigenize	Don't Indigenize
Firm A		
Indigenize	(a_{11}, b_{11})	(a_{12}, b_{12})
Don't Indigenize	(a_{21}, b_{21})	(a_{22}, b_{22})

Obviously if the domestic production of a component is profitable even when the components are subject to concessional rates of duty i.e. the difference between the c. & f. price and the cost of production falls short of concessional duty on the import of components, both firms would indigenize with pay-offs (a_{11}, b_{11}) . On the other hand, if the cost disadvantages exceed even the statutory rates of import duty on components, none of the firms would try to indigenize with pay-offs (a_{22}, b_{22}) . However, when the inefficiency in production exceeds the concessional rate of import duties, but falls short of the penalty duty, the producer will have to chalk out a strategy; they may collude or take independent decisions.

The collusion strategy leads to higher profits for both the firms, if the government fails to impose penalties and to lower profits for both the firms if government imposes the penalty duties. Therefore, the probability of penalties being imposed would be a major determinant in the decision to indigenize. Besides the producer may be able to evade the penalty duty by raising the transfer price of those components which still enjoy the benefit of concessional duties, and lower the price of

¹²Penalty cost is the extent by which cost of domestic production exceeds the c. & f. values.

¹³See. Chundovsky, Nago and Jacobsson (1983).

inputs which are subject to the statutory rates of duties.¹⁴

While the new deletion policy, no doubt, suggests imposition of penalties, and fixing c. & f. values of components, yet past experience with government's resolve to impose penalties does not hold much promise. It is very likely that on the assumption that the probability of penalties being imposed is rather low, the producers would collude and decide not to indigenize.

Even when the domestic firm finds it advantageous to indigenize, the foreign collaborator may not be interested if the total profits, consisting of the share in the profits of the domestic firm and the profits from sales of components, fall. The principal's profits (Πr) are:

$$\Pi r = \gamma \sum_{k=1}^n P_i^w a_i + \eta \Pi$$

γ is the profit of foreign collaborator through sales of components measured as a percentage of the c. & f. value of component; and

η is the share of foreign equity in domestically incorporated firm.

Obviously when the domestic manufacturing of the component increases the foreign collaborator's sales of components would fall and consequently his profits would also fall. The profits of domestic firms may fall or rise depending upon the cost inefficiencies. In general, cost inefficiencies may exceed the concessional duties and as such profits would fall. Even where the cost inefficiencies fall short of concessional duties, increase in his profits from the domestic incorporated firm may be insufficient to compensate for the decline in profits from sale of components. Therefore, the foreign collaborator is expected to resist indigenization. Only when the penalty duties are high (leading to a steep fall in the expected profits of the domestic firm as well as that of the foreign collaborator), would the foreign collaborator consider indigenization. It also follows that the higher the share of foreign collaborators in the equity of the domestic incorporated firm, greater are the chances for indigenization.

In the existing policy framework, where the duty on the finished product is about 100 percent, and the concessional import duties on components are 20 percent, huge profit margins are created at the assembly stage. The profits tend to fall as more and more parts are manufactured. A system which envisages the declining profit rates with indigenization does not have much prospect of success. The producer is showered with threats of penalties to force indigenization, but you can take a horse to water but cannot make it drink even if you whip it.

¹⁴The c. & f. price of component subjected to concessional import duties is raised to ensure the foreign exchange repatriation to pay full for the transferred components to domestic firm by the head-office.

The simple fact is that incentives rather than the administrative mechanism can accomplish the desired economic results need to be underscored. For indigenization, the production of components will have to be made more profitable than the assembly. Accordingly, instead of allowing the sponsor to import components at only 30 percent and thus creating huge margins for assembly, the rate of import duty on components should be brought closer to the import duty on the finished product. As a firm accomplishes certain percentage of indigenization, the rate of import duty on the remaining imported components should be lowered. The incentives need to be built-in in the form of progressively higher rebates in import duty on the remaining imported components as higher and higher levels of indigenization are attained.

V. CONCLUSIONS

The main conclusions of the study are summarised below.

- (i) Enhanced incentives for assembly has resulted in the sharp increase of production in the capital-goods industries in the Eighties;
- (ii) The policy of concessional duties on imported components, which led to rapid expansion in the assembly lines is the main stumbling block in the way of indigenization;
- (iii) The government's policy to raise profitability of assembly and forcing producers through penalties to indigenize does not have very bright prospects as no producer would willingly go for a programme which promises declining profits over time;
- (iv) The producer has a perception of very low probability of the penalties being imposed. Even when penalties are imposed in the form of high import duties on components, the transfer price mechanism may be used to lower the total incidence of import duties;
- (v) The foreign collaborator has the least incentive to indigenize as he loses profits due to reduction in his sales of components. A higher share in equity would encourage the foreign collaborator to transfer technology; and
- (vi) The deletion policy needs a basic change by relying on incentives instead of penalties. The assembly should be made less profitable and the rate of duty on components should be positively related to the percentage of components being imported.

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Small-scale production is a key element in the development of a country's economy. It is building up a strong industrial base as small-scale manufacturing is essential for or region; developing a strong industrial base within the country; and providing a training ground for management and labour. Manufacturing is also a source of employment and entrepreneurial talent which is essential for the process.

In Pakistan, the importance of small-scale industry has been given its due recognition. The government has been focusing their main attention on the industry during the First Five-Year Plan (1955-60).

"Small industries have specific contributions to make in economic development. In the first place it can contribute to the development of rural areas without requiring the organization of large-scale projects. It can also provide opportunities for employment beyond the narrow limits of urban centres. Finally, as history shows, it can perform an important function in promoting growth, providing a training ground for management and labour and spreading industrial knowledge over wide areas." (Government of Pakistan, First Five-Year Plan p. 473)

Statements in a similar vein relating to small-scale manufacturing were repeated in the successive five-year plans.

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