CHAPTER VI
THE CONCLUSION.

The objective of the thesis is to observe the significance of 'firm size' dimension in explaining the exports of manufactured goods in imperfect competition framework. This, in turn, leads to answering the question of why different size groups of firms are behaving in an identifiable fashion towards exports. The relevance of firm size is derived out of the recent developments in trade theory in imperfect competition framework, in its relevance to the type of market imperfections that are prevalent in the Indian industry and the economy. The question of 'why' different size groups behave in the identified fashion leads to the identification and analysis of the type of market imperfections or economic factors that cause the export behaviour of the size groups, established.

The analysis is based on two major underlying conditions. First one is adherence to Linder's (1961) argument, in a slightly modified terms, that firms are set up to cater to the domestic market first and exports are an offshoot of the domestic activity. The modification is that in a market structure characterized by monopoly or oligopoly conditions, firms need not saturate domestic demand (on a downward sloping demand curve) in order to export. But, on the core, exports are taken to be a result or reaction to the domestic conditions. The other condition is the
assumption of small country in the world market. In other words, all firms of the domestic industry are taken to be the price takers in the world market.

Under the above condition, the export behaviour of different size groups is analyzed to be the process of their adjustment to the domestic conditions in which the market structure is the principal. The market structure that is abstracted is the long tailed market structure which is straightforward in the case of light engineering industries. In the case of heavy engineering industries, the long tailed market structure is an indirect one, possible in an vertically separable production structure. Few large firms at the top ladder produce the final products and large number of S&M firms produce the components and intermediates for the large final product manufacturers. So the market structure determinants of firm level exports, on the overall, are taken to be generalizable depending on the nature of the results.

Under the long-tailed market structure of the industry the few large firms at the top ladder (who take the major market share of the industry) are taken to face oligopolistic conditions and the large number of small and medium firms (within the industry) are taken to face competitive conditions. 1 In such a market structure, the differential market structure pressures on the large and

1 The word of 'competitive conditions', here, does not follow the strict definition of 'perfect competition.'
small firms (within an industry) determine their respective export behaviour.

On the basis of the primary objective, the overall results at the aggregate as well as at the disaggregate classification of the engineering industries samples, indicate that export propensity declines as firm size increases. In other words, proportionate increase in exports declines as firm size increases and after a critically large firm size even absolute exports decline as size increases. Although the non-monotonicity in the relationship established and the concept of the critical size is generalizable for the engineering industry as whole, the levels of the critical firm sizes identified are not. The critical firm size, where the relationship between firm size and exports changes, through the demand and supply side factors, is industry specific.

The above observation does not mean that smaller the firm higher is the export propensity. The results (of equations III and V) indicate that firms have to reach a critical minimum threshold size in order to 'produce' the exportable products (on a vertical product differentiation plane). Although the concept of the technological threshold size is generalizable, but the level of the threshold size identified is industry specific. The critical minimum size is determined by the specific technological conditions of different industries and also the nature of export demand.
In industries like Steel tubes and pipes, although small firms have export presence, as shown by the results, their export relevance is low. This is because of the nature of technology, the product and export orders and also the high transport cost element involved in exports. So the generalization, here, is that after the critical threshold size, as firm size increases export propensity declines.

Before discussing the identified economic factors governing the export behaviour of the large and S&M firms, the following observations give some of the limitations of the analysis and the methodologies adopted.

Given the complexity of the existing phenomena, the methodology adopted, in identifying the underlying economic factors, from the supply and demand side, is in terms of identifying the possible dominant causes.² The a priori hypothesized dominant causes, in the analytical framework, may not explain the phenomena completely. Some of the relevant causes, which are not included in the analysis, are identified in the process of searching for the explanations. Some of the arguments put forward in Chapter III might not be captured or brought out explicitly in the empirical analysis due to the data and measurement limitations. But these arguments are used to give the possible underlying reasons behind the identified export behaviour of the size groups.

² For any given outcome, there could be numerous causes, which could be mutually-supportive or mutually counter-veiling.
Some of the variables are taken to represent the economic factors in implicit terms. The necessity for the implicitness arises not only due to data limitations but also due to measurement problems. For example, the firm size variables used, are taken to represent firm level domestic market power implicitly, under the assumption that in an imperfect market structure, larger is a firm higher is its market power. This is based on the theories of industrial organization that larger size of firms results in internal scale economies and the scale economies, in turn, result in imperfect market structures. Firm size, even in relative terms, may not be an accurate measure of domestic market power because cost and price conditions may play more important role rather than a pure firm size dimension.

The variable of imports of raw materials and components is taken to represent two self-supportive economic factors. One is from the market structure in terms of its effect on the firm level domestic market power. The other is that it is taken to be a proxy to the extent of imported technology of firms. In the later case, where the results are interpreted on the basis of the proxy, the results can get more (or less) support if a closer measure of the imported technology like the extent of imported capital goods is used.

In case of some of the variables, like firm level technical efficiency indices, the methodological dimensions in the measurement, itself, have implications on the possible economic factors behind the
results. Generally TE is measured under the assumption that all firms in the industry adopt a homogenous technology and firms which are relatively inefficient are the ones which use excess inputs to produce a given level of output. If this assumption fails in terms of that firms are operating with different levels or different technologies, the efficiency differences due to this will reflect in the measure. The technology that determines the efficient frontier could be the latest vintage or the imported (from the advanced countries) technology. Firms which adopt this technology could be the ones which determine the efficient frontier. But, on the other hand, the technology that determines the relatively higher TE values (or higher total factor productivity in the sample) could be the one that falls in line with the specific domestic technological features and factor endowments. This type of technology might facilitate realization of the highest total factor productivity possible for a given level of inputs spent. In such a case, the TE indices would reflect the domestic comparative advantage in certain technological features specific to the country. On the basis of the argument of comparative advantage or efficiency (due to technological distance or differences across firms), the TE indices should explain exports positively and significantly. \(^3\) The results give

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\(^3\) Since the objective is to explain exports and the possible effects of technological gap between firms on their respective exports is built into the analysis in Chapter III.III, the dominant factor in TE that explains exports could be taken to be the one due to efficiency differences arising out of the differences in technology.
support to the argument to some extent. It is not the imports or the import intensive large firms which are determining the highest TE levels, but it is somewhere in the medium firm size range, where the TE indices are the highest and this is where the TE indices are explaining exports positively and significantly. But to derive more reliable interpretations of the results on the basis of the above argument, a more explicit proof is required.

One of the drawbacks of the estimated technical efficiency measures is that production functions are estimated on the assumption that all firms face same price regimes. If large firms get higher product prices for a given quality of output, due to their higher domestic market power, the estimated technical efficiency would be upward biased in favour of large firms.

The X-efficiency dimension is frequently used in the arguments. But, it is extremely difficult to measure or segregate firm level X-efficiency empirically as it talks about managerial and labour motivation etc. The firm level (relative) X-efficiency differences are taken to be reflected partly by the TE variable as one can argue that firms which are relatively X-efficient would realize higher level of output for a given level of inputs used. This argument can be justified because the TE measure is a relative measure.

In the case of labour and labour intensity variable, the implications of skilled and unskilled labour components in the way the variables are measured are taken into account in interpreting the results.
associated with the variables. An explicit decomposition of the components will be more useful.

Measurement of the capital input is always troublesome in empirical works. In the present case the total capital reduced to the present value, with more information than it was obtained, will be a more reliable measure.

In case of the systematic allocative efficiency measure AEii, the shadow factor prices, especially of capital, is a benchmark one. More accurate values of the shadow prices of capital and labour would give more reliability to the findings.

Lastly, given the complexity of the problem at hand, a minimum possible level of adhocism in the interpretations is unavoidable.

The answer to 'why' large firms as a group have lower export propensity than S&M firms can be explained by the domestic market structure conditions.

In the long tailed market structure characterized, majority of large firms at the top ladder of the industry have secure domestic markets and also face little threat of new entrants. In addition, most of these firms are generally concentrated in the production of final products. The final engineering product industries are characterized by high effective rates of protection (ERP's) from imports. Consequently, the large firms face low competitive pressures in the domestic markets and could reap monopoly profits. Apart from this, the rate of returns in the industries with higher ERP's tend to be
higher. This, in turn, might have resulted in higher relative profitability of domestic sales to exports to the large. To recapitulate, most of the large firms responded in the field study that exports are not profitable. Large firms, under a fixed production capacity (short run), with higher domestic market power attained through brand names etc, would be able to charge higher prices in the domestic market than the S&M firms. As a result, their relative profitability of domestic sales in comparison to exports would be higher than for S&M firms. Consequently the export propensity of large firms tends to be lower. Secondly, due to low domestic market pressures, these firms would become x-inefficient, which, in turn, would result in lower comparative efficiency in exports.

In case of S&M firms, entry into the small scale sector is easy. This is facilitated by the low fixed cost element involved in setting up a SSI unit but also by labour market fragmentation (higher access to the unorganized labour at low wages) and the government policies towards the SSI sector. These factors led to over-crowding by large number of small firms both in the light engineering industries and also in the intermediate manufacturing of the heavy engineering industry. Apart from this, several of the component industries, concentrated by small firms, are characterized by very low or even negative ERP's. As a result, small firms face severe competitive pressures and barriers to expansion in the domestic market. Under
these conditions, several small firms, in order to survive and expand, adapted themselves to be efficient producers and exporters. As observed in the field study, the monopsonistic behaviour of the large final product manufacturers also pushed several sub-contractor small firms to branch out into export markets, in order to reduce their dependence on a few buyers in the domestic market. The small firms which adapted themselves as efficient producers, were able to turn into exporters. The results clearly indicate that firm level relative efficiency is a necessary condition for S&M firms to export and that among the S&M firms it is the relatively efficient producers which have higher export propensity.

Although the large firms as a group have low propensity to export, larger proportion of large firms, in terms of numbers, export compared to S&M firms. The econometric results indicate that unlike in case of S&M firms as a group, among the large firms it is the relatively inefficient producers which have higher export propensity. Secondly it is the relatively capital intensive large firms which have higher export propensity. Some of the possible reasons for this are as follows.

As theoretically argued, large oligopoly firms could export through price discriminatory behaviour towards domestic and foreign markets. Among the large firms, at the top ladder of the market structure (assumed to be immune to the behaviour of S&M firms), there would be oligopoly rivalry for the domestic monopoly
profits. Among the oligopolists, it would be the relatively efficient firms which could dictate the market terms in the domestic market to a large extent. They could take the major share of the domestic market and would be able to impose the market share terms on the relatively inefficient large firms. As a result, the inefficient large firms would be more prone to export, if their existing production capacity is higher than the imposed market shares (see Chapter III.I.1). This observation gets additional support from the result that among the large firms it is the relatively capital intensive firms which are more export oriented. Higher the capital intensity higher would be the possibility that the production capacity would be higher than the (imposed) market shares and higher the need to export to utilize the idle production capacity. These firms, with excess capacity, could export through price discrimination by pricing the exports at short run marginal costs even if their average costs are higher than the world market price, (instead of keeping the capacity idle). Secondly the export activity by these firms could function as a means to compete in the domestic market by facilitating higher capacity utilization and also by giving higher access to imports,(through the import replenishment policies).

One more additional result, a weak one, is that among the large firms, the firms with overseas investment, appears to be more export oriented than the other firms.
These firms might be able to export more due to vertical integration with their overseas subsidiaries and also due to higher exposure to the overseas markets. The market structure issue that is relevant, here, is the question of why do these firms undertake foreign direct investment, which is far beyond the scope of the thesis.

Access to large protected domestic markets (as argued by Krugman (1984)), could lead to static and dynamic scale economies and as a result, relative advantages in the world market. But in case of the Indian large firms, access to the protected domestic markets appears to be more of a source of monopoly profits rather than the possible relative advantages of static and dynamic scale economies in exports. There is no proof of scale economies advantages to large firms in exports. On the contrary, the results indicate that firm level exports (growth) and domestic sales turnover (growth) are negatively associated (the results of equation IV), which implies that exports and domestic activity are substitutes rather than complimentary to each other. Apart from this the scale economies indices are negatively associated with exports. The possible reasons for the absence of the scale economies advantages can be seen in terms of the size of the domestic market and the nature of domestic demand.

4 If exports and domestic sales are moving in the same direction, one can say that domestic market (sales) is operating as a source higher export performance. This would be the case when exports are taken to be a function of domestic sales.
The large firms, generally concentrate, in the consumer goods areas which cater to the minority rich with consumption patterns similar to the developed country consumers. The domestic market for these goods is small compared to any developed country. Although on the basis of Linders representative demand argument the large firms should be able to export to the large developed country markets, the small size of the domestic market does not give any scale economies advantages to compete in those and also in third country markets. But the domestic market for several engineering products like Bicycles etc., whose demand is price elastic (low quality goods oriented), is significantly large. But on the basis of the representative demand argument, the exports to the developed countries require production of higher quality goods (on a vertical product differentiation plane.) If a (large) firm has to produce different type or quality products for the domestic and export markets, it will result in shorter production runs and consequently reduce the scope for the scale economies advantage in exports.

The large firms which take the major share of the domestic market should be able to internalize any external economies in the domestic industrial base and skill endowments. For example, as observed in the field study, the large final firms which manufacture the final products, could internalize the external economies in the growth of the ancillary sector resulting in the (Stigler's (1951) type of) economies of specialization.
Due to their higher bargaining strength, the large firms could internalize these economies. Furthermore, the large firms which have higher access to imported inputs should be able to realize the Ethiers type of external economies. But the internalization of these economies appears to enhance their domestic market power and profits rather than any significant exports.

Under the given domestic market conditions and the policies, the large firms, in search of monopoly profits prematurely diversify into different operations on a import substitution cycle. Instead of flooding the domestic market with a few products by expanding production capacities, which may depress the prices and profits, it might be profitable to prematurely diversify into multiple areas with high returns. This obviously reduces scope for scale economies in any single operation.

As far as the dynamic economies of learning by doing are concerned, analytically, they are relevant to all size group of firms. On the basis of the field study observations, S&M firms are able to realize these economies due to their higher x-efficiency in specialized operations. The econometric results indicate that specialization is positively related to export activity. This may be especially true in the case of S&M firms whose major strength is their x-efficiency in specialized operations.

Growth of S&M firms in specialized operations has significant positive implications on the dynamic economies and subsequently on exports. But
premature diversification into multi-product and multi-plant operations by the efficient S&M firms, which is observed in the field study, to be quite prevalent due to the government policies towards the SSI sector will result in the diffusion of managerial involvement and consequently in lower x-efficiency. This, in turn, reduces the scope for the potential dynamic economies advantage in exports.

There is direct evidence in the results, regarding the presence of the dynamic economies in export activity arising out of cumulative experience of firms in export activity over time. S&M firms ability to absorb these learning by doing economies in export activity might be high due to their simpler organizational structure and higher x-efficiency. Large firms might be able to realize these economies at the same level as a small firm at higher export propensity. A higher degree of export orientation could bring in fundamental organizational changes (due to higher export market pressure) and closer integration of different divisions and domestic and export activities and consequently to efficiency improvements in these firms. It is important to take into notice, here, that the initial exports that takes place are a result of the domestic market conditions. But, the role of the domestic conditions or market structure in the dynamic economies of export activity would be less significant.
The primary relationship established between firm size and revealed exports is explained by the domestic market structure argument. The differing market structure pressures also determine not only the different size group of firms ability to transform the domestic supply side comparative advantages into production but also the realization and transmission of the supply side advantages into revealed exports.

In the long-tailed market structure, the differential domestic market structure pressures determine the nature of technology and production techniques adopted by different size group of firms which, in turn, determine the ability of the size groups to transform the domestically available inputs into exportable products in accordance with the domestic comparative advantage.

If one goes by purely in terms of revealed exports or revealed comparative advantage, the results of equations III and the results with respect to technical efficiency (TEO variable in equation V tell us that one can not really generalize that an industry's comparative advantage is either in labour intensive or capital intensive operations. Given the heterogeneity in the nature of technology and labour and capital employed by different size groups, their revealed exports are governed by differential supply side factors.

But the story would be different if we go by the condition that in the labour abundant and capital scarce Indian economy, the comparative advantage in
exports is in labour intensive techniques. Within the large firms as a distinct group, there is a kind of Leontiff paradox. Within the large firms, it is relatively more capital intensive firms which have higher export orientation. One of the possible explanations that could be derived are in terms of the domestic oligopoly rivalry and excess capacity factors in influencing the exports of large firms (as discussed earlier).

Going strictly by the results higher labor intensity is resulting in higher exports only at the firm size range of Rs. 31 crores sales turnover in the industry in consideration. But, as mentioned earlier, one has to be very careful in interpreting this result because, given the heterogeneity in the type of labour employed by firms and the nature of labour market segmentation (the wage differentials), the way the labour intensity variable is measured has implications on the result.

On the basis of the results, one can say, that firm size itself is a technological dimension - in terms of the nature and the process of the effective transformation of inputs into outputs and its relation to exports. Different size firms appears to adopt different methods or technologies of transforming the inputs into outputs.

As mentioned earlier, a firm has to reach a technological minimum threshold size in order to produce exports. After the threshold size the relationship between the production processes of the different size groups
and their exports is governed by the differing domestic market pressures.

As discussed in Chapter III.III under the existing domestic market structure conditions, the technological behaviour of the large firms, at the top ladder could result in the deviation of their production processes from the domestic comparative advantage in the domestic factor endowments and incomes. This would be a result of their monopoly market power in the protected domestic markets, as these firms would have low domestic market structure pressure to produce at the lowest costs possible (in macro sense) or in other words, to maximize the (potential) total factor productivity on the basis of the domestic factor endowments. The large firms can make super normal profits even by adopting the sub-optimal production technologies and techniques in the domestic market.

In the long-tailed market structure, the monopoly or oligopoly privilege, the large firms have should result in Shumpeterarian innovation and the temporary comparative advantages in exports out of the innovations. On the basis of the existing literature on the technological behaviour, one can say this phenomena is very minimal among the Indian large firms. The technological behaviour of the large firms can be said to be more towards maximizing the domestic monopoly profits rather than minimizing costs in relation to the domestic factor endowments and incomes. The technological behaviour is more in terms of importation
rather than doing any significant innovation and R&D. Higher access to the imported technology and brand names appears to augment the domestic profits rather than exports.

The secure domestic market and high profits associated with the imported technology and brand names do not impose much pressure on the large firms to adapt these technologies most efficiently on the basis of the domestic factor endowments and shadow factor prices.\(^5\) This could get accentuated due to the factor market distortions like their higher access to the scarce factor, capital at far lower price than it's shadow price. As a consequence these firms would be able to still reap super-normal profits in the domestic market, by making the capital intensive imported technologies even more capital intensive. This, in turn, reduces their ability to export on the basis of the country's comparative advantage.

If we assume that the imported technologies are of the later vintage (or the most advanced), the large firms which have higher access to them should determine the most efficient production frontier in the industry. But the results show that this is not the case. The technical efficiency estimated is highest somewhere in the medium firm size level. And at around this firm size range the estimated TE is explaining exports

\(^5\) Adopting a production technique on a given technology is different from adapting a technology, in relation to the indigenous supply side conditions. In the latter case, the shape of an isoquant, representing a technology, can be changed.
significantly. What does this imply! After the technological minimum threshold firm size, the firms which are able maximize productivity by adopting the type of technology and production techniques (the labour and capital combination) on the basis of the domestic factor endowments and incomes, could be the ones which could realize the highest TE. In turn, these firms could realize the comparative advantage in the factor endowments and certain domestic technological conditions most effectively.

In the long-tailed market structure, unlike the large firms, S&M firms (in generalized terms) face highly competitive conditions in the domestic market. These firms have very low access to imported technology and brand names. Consequently, only way these firms can compete in the domestic market is by producing output at the lowest costs and pricing it at the lowest price, possible. As observed in the field study, a model efficient small or medium firm tends to minimize both the fixed costs involved in choosing and installing the machinery and also the variable costs in operating it at maximum capacity possible. As a result, these firms maximize the total factor productivity by adopting the methods and techniques of production more on the basis of the indigenous technological features and domestic factor endowments and incomes. This, in turn, puts them in better position to reap the supply side comparative advantages in exports more effectively.
Furthermore, as observed in Chapter III, S&M firms generally are concentrated in those industries which have low or even negative effective rates of protection (ERP's), while the large firms concentrate in those with higher ERP's. One way the S&M firms can compete with imports or in other words, produce at lower prices than imports is by adopting the technology and techniques of production which facilitate the maximization of gains out of the domestic comparative advantage. Consequently these firms production processes could fall more in line with the domestic factor endowments.

It is important to keep in consideration, here, that the results obtained are on the basis of an expost phenomena. The transmission of the supply side comparative advantage into the exports, that have taken place, is possible only after the firms could break the demand side barriers in exports. The demand side barriers in exports are in terms of the Linder's representative demand and product quality in line with the export requirements etc. A firm which adopts a production process in line with the domestic factor endowments but produces a product whose quality or features does not conform to the export market requirements would not be able to export. This argument is implicit in the observation regarding the technological threshold size in export activity, to some extent.

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6 This would be most likely in many of the component industries.
The results obtained with the allocative efficiency measures (AEi) and (AEii) give support to the above observations regarding the nature of production processes and the choice of production techniques adopted by large and S&M firms and their relation to the domestic factor endowments and factor prices.

In case of the allocative efficiency measure, AEi, which is measured on the basis of the capital price of 12 per cent interest rate and a fixed wage rate, the price of capital is argued to be far below its domestic shadow price and it is what the large firms generally pay.

In case of the systematic allocative efficiency measure, AEii, which is measured on the basis of the capital price of 21 per cent interest rate and a variable wage rate, the price of capital is argued to be closer to its shadow price and it is what S&M firms generally pay.

In a highly distorted factor market conditions, the relative shadow factor price ratio (or factor price line) reflect the domestic comparative advantage in the relative factor endowments in terms of their relative opportunity costs or prices.

The allocative efficiency measure AEi explained export propensity in negative terms. The allocative efficiency measure AEii explained export propensity in positive terms. This implies that the firms which have access capital at far below its shadow price would adopt the production techniques deviated from the
country's comparative advantage and would be operating at excess costs than it is optimally possible under the given factor endowments of the country. Consequently their ability to realize the domestic comparative advantage in the factor endowments would be low. The positive explanation of exports by the AEii measure, based on the shadow price of capital, gives considerable support to the argument.

Under the existing domestic factor market conditions, the implications of firm size in the above results is obvious. As mentioned earlier, India's factor markets are highly segmented. The large firms which have access to the organized banking sector, whose lending rate of interest rate ranges between 11 to 12 per cent and also exclusive access to the share capital could adopt the technologies which are more capital intensive than the optimum capital intensity determined by the domestic factor endowments or shadow factor prices. The cost minimization on the basis of the private cost of capital would be sub-optimal on the basis of the opportunity costs of the factors of production. As observed in Chapter III.III, the large firms generally shy away from adopting labour intensive techniques due to labour management problems. As a result, the choice of technique on a given production technology frontier of large firms deviates from the country's comparative advantage in relative factor endowments. S&M firms have lower access to the capital of the organized banking sector and also to the share capital and have higher
access to the unorganized labour markets. As a result these firms tend to pay higher price to capital and relatively lower price to labour which tend to be closer to their shadow prices.

Apart from this, the firm level import intensity variable explained $AE_i$ in positive terms and $AE_{ii}$ in negative terms. This indicate that firms which get access to capital at lower price would tend to adopt the capital intensive imported technologies. Consequently, if these technologies are not properly adopted in accordance with the domestic factor endowments, it results in the production processes deviated from the country's comparative advantage.

The basic underlying factor that differentiates the export behaviour of the large and S&M firms, within an industry, is the domestic market structure. Under the long-tailed market structure of an industry, characterized, the large and small firms face differential domestic market structure pressures within an industry. In generalized terms, the highly competitive pressures in the domestic market push the S&M firms, (which face 'expansion barriers in the domestic market), towards export markets. Apart from this, the domestic market structure puts pressure on the S&M firms, in general terms, to minimize costs on the basis of the domestic factor endowments and incomes. This, in turn, facilitates their realization of the comparative advantage in the domestic factor endowments.
On the other hand, the large firms, due to their oligopoly status (in a long-tailed market structure), could charge higher prices in the domestic market than the small firms. This appears to have resulted in their higher relative profitability of domestic sales to exports which made them more inward oriented. Secondly, the low domestic market pressures and higher access to scarce capital at lower price than its shadow price do not put adequate pressure on these firms to minimize costs on the basis of the country’s domestic factor endowments and incomes. This, in turn, results in the deviation of their production processes from the comparative advantage in the domestic factor endowments and incomes.