1. Introduction

A major reform process in the Indian economic policy regime away from a four-decade-long inward orientation has been under way since July 1991 in response to a serious macro-economic crisis. The new policy regime aims at liberalising regulations on domestic economic transactions (including private investment) and a much greater integration with the world economy. This involved devaluation of overvalued exchange rate and liberalisation of restrictive industrial and trade policies. These changes have created an enabling environment for export expansion. How far these changes translate themselves into an expansion in export earnings depends on - (a) the responses of micro-level economic agents to the changes in policy that have enhanced the profitability of selling in the external markets relative to that in the domestic market and (b) available opportunities for exchange in the international markets. In turn, this micro-level response gets reflected in the directional impact of several firm-level choice variables like technology, scale of operation and product-mix representing the organisational efficiency apart from the relative factor prices faced by them. In this context, the present paper proposes to examine the behaviour of modern small-scale industrial units located in Delhi towards exports of Textile Garments and Apparel on the basis of the Census of Small Scale Industrial Units[1] carried out during 1987-88. Although the survey period relates to a pre-Reform year, we use it in the absence of a similar data set for a post-Reform year under a plausible postulate that the directional impact of the firm-level determinants of competitive advantage derived from industrial organisation theory would not differ between the pre and post-Reform period. If anything, the more favourable post-Reform incentive structure for exports may be expected to strengthen the magnitude of directional impact estimated in this paper.

Three interesting features of the study deserve to be highlighted. One, the study is based on the units located in the same area where the firms may be expected to face the same input prices and pay the same wage rates so that the observed inter-firm differences in competitive export markets can be traced to differences in organisational efficiency as reflected in the firm-level choice variables. Two, firm-level technical efficiency estimated from stochastic frontier function has been introduced and found to be significant in explaining export performance. Three, we examine two distinct aspects of export behaviour of firms, namely, whether to export or sell in the domestic market leading to export decision

function and given this choice, how much to export giving rise to export performance function. We empirically estimate the impact of factors governing both the functions.

Textile Garments and Apparel is one of the major export items of India. The garment exports accounted for about 9 per cent of total Indian exports during 1981-82. The share has almost doubled to 17 per cent by 1994-95.[2] These exports have been growing at an annual compound rate of 22 per cent through out the 1980s. The average annual rate of growth of garment exports for the period of 1985-86 to 1989-90, has been as high as 32 per cent.[3] Nearly, 33 per cent of the domestic production of Hosiery and Garments by small scale industrial units was exported during 1987-88.[4] The present study draws on the international trade and industrial organisation theories to suggest firm-level factors that impart competitive advantage, approximates them in data, uses the Probit and Censored Regression (Tobit) Models to verify them and finally brings out their policy implications for export expansion in the Textile Garment and Apparel industry.

The paper is organised as follows. Section 2 discusses the possible factors that are expected to influence the decision of the firms to export or not and those governing the export performance of the firms. This leads to a specification of both export decision function and export performance function. Next section indicates the data base and establishes the empirical relevance of the determinants of exports that are identified in section 2. Section 4 deals with the estimation of the two export functions and econometric problems involved. Section 5 examines the empirical results of the export decision function estimated from the Probit model. In section 6, we present the empirical results of the export performance function estimated from the Tobit model. The final section summarises the findings and their implications for government policy.

2. Analytical Considerations

Export performance of any single commodity is governed by - (a) the character of the government policy regime in the exporting and importing countries; (b) external demand conditions and (c) supply response in terms of establishing and maintaining price and quality competitiveness in the external markets. In this section, we discuss these factors with reference to the Textile Garment and Apparel Industry.

Predominantly inward-looking or import substitution strategy and the associated restrictive trade and industrial policies in India till 1991, created a bias against exports. The trade policy package consisting of overvalued exchange rate and a variety of high tariff and quantitative restrictions on imports made effective exchange rate for exporters lower than that for importers and thus discriminated against exports.[5] Import restrictions along with the industrial policies like capacity licensing resulted in insulating the domestic producers from external as well as internal competition and provided sheltered domestic market to existing producers. The net impact of all these policies was to enhance the profitability of selling in the domestic market relative to that in the external markets. Economic policy reforms initiated in July 1991 involved devaluation of the currency, phased reduction in the peak rate, the average rate as well as spread of import tariffs, removal of quantitative import restrictions except those on consumer goods and the removal of industrial licensing except for a short and well-defined negative list. In addition, government introduced or continued various export incentives like duty drawbacks and advance licensing. These policy changes created a favourable environment for exports by raising the profitability of selling in the international market.

Turning to external demand conditions, Nurkse (1959) had emphasised external demand as the most binding constraint on exports from low income countries.[6] This thesis was later challenged by Kravis (1970) who traced the stagnation in exports of less developed countries primarily to internal supply constraints. Kravis argument was corroborated by an empirical examination of this issue for the recent period (1970-87) by Panoutsopoulos (1992). This analysis showed that although the rate of growth of apparent consumption in volume terms in the major industrial nations was low, the percentage share of imports especially from the developing countries in apparent consumption increased over time despite the imposition of non-tariff barriers in the case of all manufactures including Textile, Clothing and Footwear.[7] This was traced to the relocation of the corresponding industries away from the developed countries where labour costs had been rising and toward labour abundant developing countries. In other words, external markets for Textiles and Clothing though not expanding very fast, did not appear to pose a constraint on exports from developing countries.

As regards the policies of importing countries, the exports of Textile Garments and Apparel have been subjected to quantitative restrictions in the importing developed countries

under Multi Fibre Arrangement (MFA) since 1974. Under MFA quotas are fixed for each exporting country in terms of volume of exports for different textile products through bilateral negotiations. Many studies have observed that these non-tariff trade barriers did not restrict exports as apprehended.[8] Rather, according to some studies, quotas appeared to have benefited those developing countries that had just entered or had negligible presence in the international market.[9]

A major proportion of Indian garment exports has so far been directed to countries like USA, UK and Germany which have been enforcing quotas under MFA though the percentage share of these quota countries in Indian Textile exports has been declining over time.[10] Although there exists scope for diversification in terms of regions and products,[11] India's garment and apparel exports have been confined to a few product categories in the quota countries.[12] However, quotas are not expected to constrain exports because of the provisions for increasing their margins in bilateral agreements.[13] In any case MFA on quotas will be phased out by 2005.

The foregoing discussion as well as empirical evidence on rapid growth in garment exports seem to suggest that neither the volume of external demand nor non-tariff trade barriers like quotas have affected Indian garment exports in a significant way. It is, therefore, pertinent to focus on internal supply factors that affect the international competitiveness of firms and hence on factors influencing the inter-firm export performance. In this context, traditional trade theories emphasise economy-level *comparative advantage* originating in relative labour productivities (Ricardian formulation) or relative factor endowments (Heckscher-Ohlin formulation) across countries as a source of potential competitiveness. The recent theoretical developments in the international economics put greater emphasis on firm level *competitive advantage* flowing from technology, product differentiation, imperfect competition and economies of scale.[14]

Production of Textile Garments and Apparel is a labour intensive activity which is expected to have potential comparative advantage in a labour abundant economy like India. *Ex post* Revealed Comparative Advantage (RCA) indices[15] for a three-digit product category namely, Women's Outer Garments - a major item in the Indian garment exports,[16] confirm

this by consistently having values well above unity during 1978-92 though declining over time.

As regards the market structure, the selected industry consists of a large number of small firms as the production of Ready-made garments had till recently been reserved exclusively for the small scale units.[17] Consequently, most of the garment exports are in the non-branded bulk export segment where cost competitiveness is more important than product differentiation. With no entry or exit barriers except for reservation, the market structure can, therefore, be taken to be competitive. Hence, considerations relating to imperfect competition and product differentiation are not relevant in gauging the competitive advantage at the firm level in this industry.

An important source of cost competitiveness at the firm level that has been discussed in trade theories is the advantage imparted by scale of operation which results in lower average costs and hence improve their competitiveness in the market. The three major sources of scale-based advantage are: (a) economies in the production process due to the presence of increasing returns to scale; (b) economies in the bulk purchases of materials and (c) economies in marketing and selling costs. In the case of Garments and Apparel, production process is expected to be scale neutral. There exist, however, economies in bulk purchase of materials and in the sale of output. Given the fact that the industry is material intensive (average share of materials in gross output is 0.60), economies in bulk purchase of materials are expected to be higher, the larger is the scale of operation. Material intensity also implies higher working capital requirements for which larger scale enables better access. Overhead marketing costs per unit would also decline with a rise in sales volume. Since the outlay on materials as well as volume of sales are directly related to the magnitude of production, we consider the value of production as a preferred proxy for scale advantage. As the magnitude of production increases, average costs are expected to fall thereby increasing the firm level competitiveness and hence exports. We, therefore, expect *ceteris paribus*, a positive association between value of production and export intensity.

Given the scale advantage, another important source of competitiveness relates to technology. As regards production technology, garment production involves four basic operations viz., cutting, stitching, embroidery / zipping / button holing and stitching and

finishing. Almost all the operations can be done manually or by manually operated or power driven machines. While specialised operation-specific machines can ensure uniformity in specifications and quality and reduce the time required for completing a given operation, the viable scale would inevitably go up. The same operations can be manually carried out by skilled workers who may either be specialised in one or a few related operations or who may be general purpose tailors specialised in stitching certain type(s) of garments. Similarly, the organisation of production can be either in batch production of parts of a given garment to be stitched together at the final stage or it can take place in a sequential fashion in the same unit. The production process thus lends itself to a wide variety of factor combinations involving different types of specialised and general purpose machines and using manual/ mechanical/ electronic devices, skilled and unskilled labour as also diversity in organising the production activity. Surveys, however, do not provide quantifiable information on these aspects which have to be crudely approximated by available quantifiable indicators. In the present study we expect the wage share and technical efficiency variables to reflect the impact of technology on export performance. The productivity per worker that is implicit in the wage share provides a possible operational approximation to a firm's technology. For the given technology, the extent to which firm operates on the frontier is indicated by the technical efficiency which we estimate with a stochastic frontier function. We turn now to an interpretation of both the wage share and technical efficiency.

Economy-level potential comparative advantage originating in relative factor endowments provides an enabling environment of cost competitiveness for firms at micro level. Firm-level organisational factors translate the potential comparative advantage at the economy-level into firm-specific competitive cost advantage. Comparative advantage of India, as mentioned earlier, is expected to originate in its relatively abundant factor namely, labour. However, it is not just cheap labour in terms of low wage rate per worker that leads to comparative cost advantage but low wage *in relation to* productivity of that labour. This is captured at the firm level in the share of wages in the value of production. The rationale can be seen from the following relation.

$$(W/P) = (W/L) \div (P/L)$$

where, W = Wage bill,

P = Value of production,

L = Number of employees.

Notice that the wage bill reflects the skill composition of firm level work force so that the (implicitly weighted) average wage is a skill composition adjusted wage rate. Similarly, productivity per worker may be taken to reflect the choice of technology at the firm level. Given the material intensity, the lower the wage share, the lower is the (skill adjusted) wage rate in relation to labour productivity and greater is the firm level competitive advantage which is expected to result in higher volume of exports. Thus, the wage share taken to be a ratio of wage bill to value of production, is expected to have *ceteris paribus* a negative association with the export performance of a firm.

Given the input prices, scale advantage and technology, a technically more efficient firm would obviously possess an additional cost advantage. *Technical Efficiency* is represented by a firm's capabilities either to produce maximum possible output given the input combination and technology or to use cost minimising input combination given a level of output and technology. The survey based data enables an approximation to the former concept and consequently technical efficiency is measured as the ratio of observed output to maximum producible output with observed input combination. It has been estimated through the stochastic Translog production frontier model.[18] Technical efficiency at a firm level can be attributed to organisational factors like nature of management, plant layout, material handling, waste control and work methods.[19] Firms using their available resources with selected technologies more efficiently are able to produce at lower costs and hence improve their competitiveness in the market and thus expected to have a positive impact on exports.

In addition to the trade theoretic variables (relevant for technical viability) two more factors are relevant for commercial viability, namely, access to capital markets and efforts made to access the international product markets.

Form of business organisation of a firm is taken to approximate the firm's access to capital market as the survey data do not provide any quantifiable information in this regard. Three forms of business organisation are distinguished in the data source of the selected industry. They are - single proprietorship, partnership and companies incorporated under the Companies Act. Two distinguishing features of these forms of business organisation relate to the liability of owners in the case of bankruptcy and legal life of the business entity. Both single proprietorship and partnership are characterised by *unlimited liability* but *limited life*.[20]

In contrast, limited companies have *unlimited life* and its shareholders have *limited liability*. One shareholder's death or selling away the shares do not affect the legal existence of the company. Limited liability makes it possible for firms to access finances from a potentially large number of limited liability shareholders.[21] The form of business organisation determines a firm's capacity to raise finances - the basic resource at firm level and hence probability of its undertaking production for exports. Form of business organisation is represented through intercept dummy variables in the export functions.

Finally, firms need to put in efforts to explore, establish and continuously expand markets to survive in a competitive environment. For this purpose firms require to develop distribution networks. The need for it is all the more so if a firm operates in the international market. Increasing globalisation of the product systems that has led to global commodity chains and the special importance of distribution and marketing links in the garment and apparel product chain enhances the importance of this factor.[22] Development of the markets and distribution networks involve expenses which are expected to be higher per unit of sales volume in the context of international markets.[23] Hence, marketing and sales expenses can be taken as an indicator of firm's actual efforts towards accessing markets and distribution networks and are expected to promote exports. Consequently, share of sales expenses would bear *ceteris paribus* a positive relation with export performance. It is defined as a ratio of sales expenses to value of production.

As mentioned in the introduction, we wish to examine two distinct aspects of export behaviour of firms, namely, whether to export and sell in the domestic market leading to export decision function and given this choice, how much to export or export performance function.

Among the factors identified in the previous discussion, the scale advantage, the efforts at accessing markets (as reflected in the share of sales expenses) and access to capital (as approximated by the form of business organisation) may plausibly be taken to be arguments in the *ex ante* export decision function. The same factors are also expected to govern the export performance at firm level in addition to the remaining two efficiency indicators, namely, wage share of gross output and technical efficiency which, by giving

competitive edge, would govern the firm level export performance. Consequently, we specify the export decision

function at firm level as:

$$\mathbf{Y = f (x_1, x_4, d_1, d_2)} \quad \text{.....} \quad (1)$$

where, $Y = 0$ for non-exporting firms,

$Y = 1$ for exporting firms

x_1 = Value of production,

x_4 = Share of sales and other expenses in production,

d_1 = 1 for proprietorship, otherwise 0,

d_2 = 1 for partnership, otherwise 0.

d_1 and d_2 are intercept dummies. Since the dependent variable in equation (1) is binary, we have estimated it by the Probit model.

Export performance function at firm level is specified as

$$\mathbf{y = f (x_1, x_2, x_3, x_4, d_1, d_2)} \quad \text{.....} \quad (2)$$

where, y = Ratio of exports to production taken to represent the export performance

x_2 = Technical efficiency index ,

x_3 = Ratio of wage bill to production,

The remaining variables are the same as in the export decision function. As the current sample has a good number of non-exporting units for which the dependent variable takes a zero value, we have estimated equation (2) using Tobit or Censored Regression Model.

3. Data Base and Relevance of Identified Factors

This section is devoted to a brief discussion of the data base used in the present study and empirical relevance of the factors identified in the last section.

As mentioned in the introduction, this study relates to the Manufacture of Textile Garments including Wearing Apparel (264) [24] located in Delhi. This industry includes Ready-made Garments (2641) and Custom-made Wearing Apparel (2642). Textile Garments and Apparel industry had 395 units in Delhi. [25] These had been surveyed during the Second

census of small Scale industrial units (CSSIU2) as the industry had been reserved for exclusive production in small scale units defined as an undertaking having original investment in plant and machinery not exceeding Rs. 3.5 millions. Unit level data for all those small scale industrial units registered with the State Directorates of Industries in India were collected under CSSIU2 conducted in 1989 for the reference year April 1987 - March 1988. We have obtained CSSIU2 data for Delhi from the office of the Development Commissioner, Small Scale Industries.

We study the salient features of the selected industry cross classified on the basis of the form of business organisation and exporting and non-exporting units separately to examine the empirical relevance of the determinants of exports discussed in section 2. We consider the following economic variables namely, scale of operation, capital - labour ratio, (partial) labour productivity, average (skill adjusted) wage rate and factor shares. All these structural ratios are presented in Table 4 in the appendix.

In the selected industry after editing, we are finally left with only 310 units out of 395, for econometric analysis.[26] Of these, 132 (43%) units are proprietary units, 122 (39%) are partnership firms and 56 (18%) are limited companies. Of the 132 proprietary concerns, only 47 units exported either full or part of their production contributing 19 per cent of exports of the selected industry. Out of 122 partnership firms, 58 units exported their production constituting 38 per cent of the industry's exports. As many as 52 out of 56 limited companies were engaged in export activity accounting for 43 per cent exports of the selected industry.

We may recall at this stage, one significant aspect of the data base used in this study and mentioned in the introduction. We have analysed units producing a narrow range of output (mainly 2641 and 2642) and located in the same area viz., Delhi. All the firms, therefore, can be reasonably assumed to face similar prices of inputs and pay same wage rates so that observed inter-firm differences in export performance can be traced to differences in organisational efficiency as captured in the quantifiable variables and non-quantifiable forms of business organisation.

Notice (Table 4 in appendix) that material intensity does not differ significantly either across exporting and non-exporting units. Given the form of business organisation, exporting

units have a considerably higher scale of operation than non-exporting units that results from a higher capital-labour ratio and consequent higher labour productivity and a lower share of wages in gross output. As argued in section 2, a lower wage share reflects a skill-adjusted wage rate that is lower in relation to average productivity among exporting units but can be seen to be associated with an absolute average wage rate that is higher than in non-exporting units. This enhances competitive advantage, brings about a higher volume of exports and consequently enables payment of higher wage rate as well as absorbing higher share of employment in exporting units. In other words, larger size exporting units provide higher volume as well as better quality employment in terms of higher (skill-adjusted) wage rate. Following our discussion in section 2, a higher share of sales expenses in exporting units is only to be expected in accessing international distribution chains in an export-oriented industry.

Focusing on all the exporting units across forms of business organisation, notice (Table 4 in the appendix) that wage share is virtually the same. In other words, all the exporting units are equally efficient users of labour in relation to productivity. This is also reflected in skill-adjusted wage rate per employee and labour productivity being not very different across forms of business organisation among the exporting units. Scale of operation, however, increases sharply in moving from proprietorship to partnership firms but much more gradually from partnership firms to limited companies. This is expected to enable better access to finance, materials and markets.

4. Econometric Issues in the Estimation

As mentioned earlier, the export decision function is estimated by Probit model because its dependent variable is binary and the export performance equation is estimated by the censored regression (or Tobit) model. Both are estimated by maximum likelihood method. Since we are dealing with the cross section data which is more prone to heteroscadasticity problem, we have tested for the same. Both likelihood ratio (LR) test and lagrangian multiplier (LM) test (given in tables 7&8 in the appendix) show that there is a heteroscadasticity problem. Hence, we have estimated the heteroscadastic versions of the Probit and Tobit models. In this respect, it is felt that scale and dummies representing forms of business organisations could be responsible for the non-zero variance of the residuals.

Accordingly, we have specified our variance term equation in the heteroscadastic versions as one or a combination of these two variables. Finally we present the equation which yields more meaningful results from the point of interpretation. The estimated equations of the export decision function and export performance function for the industry are given below.

$$Y = 0.5629 + 2.3587\, x_1 + 1.2819\, x_4 - 1.3219\, d_1 - 1.5631\, d_2$$

(0.606) (1.741) (1.534) (-2.283) (-3.146) ..... (3)

$$y = -0.4727 + 0.0166\, x_1 + 1.4325\, x_2 - 1.2146\, x_3 + 1.6195\, x_4 - 0.7881\, d_1 - 0.6580\, d_2$$

(-0.704) (1.810) (1.608) (-2.913) (4.527) (-6.185) (-5.845)

..... (4)

t-values given in the parentheses indicate that all the parameter estimates of both the equations are statistically significant and directionally consistent with *a priori* expectations. Estimated parameters (β) of both Probit and Tobit models are not marginal coefficients. Marginal coefficient for a given explanatory variable x_j in the case of Probit model is written as[27]

$$\partial E(Y / x_j) / \partial x_j = \phi(\beta' X)\ \beta \qquad \text{..... (5)}$$

j = 1..... 6 refers to individual explanatory variables

ϕ (..) is the standard normal density

Marginal coefficient as regards Tobit model is written as[28]

$$\partial E(Y / x_j) / \partial x_j = \beta\, \Phi(\beta' X / \sigma) \qquad \text{..... (6)}$$

Φ (..) is the standard normal cumulative density.

From (5) and (6) it is clear that the marginal coefficients are proportional to parameter estimates (β). We present below marginal coefficients for clarity in interpretation.

5. Factors Influencing Export Decision Function

As discussed in section 2, we have considered scale of operation, sales expenses and form of business organisation as the factors relevant for the decision of the firms to export or sell in the domestic market. Accordingly, we have framed our export decision making equation and estimated it using Probit model. Using the mean values of the explanatory variables specific to each form of business organisation, we have derived separate sets of

marginal coefficients for the three organisational forms of single proprietorship, partnership and limited companies. They are presented in Table 1 given below.

Table 1: Probit Estimates of Export Decision Equation and Marginal Coefficients

			Marginal Coefficients		
Variable		**β**	**Proprietorship**	**Partnership**	**Limited Co**
(1)		(2)	(3)	(4)	(5)
Constant		0.5629	-0.7589	-1.0002	0.5629
Scale (x_1)	(Rs. crores)	2.3587	0.7538	0.1217	0.0017
Share of sales expenses (x_4)	(ratio)	1.2819	0.4879	0.0124	0.0001
$\phi(\beta' X)$			0.3806	0.1182	0.0009

Notice that in deriving the marginal coefficients, the multiplicative factor specific to each form of business organisation is indicated in the last line of table 1. This factor is the lowest for the limited companies, the highest for single proprietorship firms with that for partnership firms lying in-between and the difference among these groups is exceptionally high. Accordingly, marginal coefficients are much higher for proprietary concerns and decline steeply for both partnership firms and limited companies. Notice a marginal coefficient in a Probit function indicates a marginal change in the probability in response to a unit change in a given determinant. Since the initial average level of probability of exporting is expected to be very high for limited companies, somewhat marginally lower for the partnership firms and much lower for the single proprietorship firms, the marginal change in probability in response to a unit change in a determinant would naturally be inversely related to the initial level of probability of exporting. This is reflected in the estimated marginal coefficients given in Table 1.

6. Factors Affecting the Export Performance of Firms

Following the analytical reasoning in section 2, we have taken scale, technical efficiency, wage share, share of sales expenses and form of business organisation as the primary variables that determine the export performance of the firms. The impact of these variables on the export performance has been econometrically estimated using the Tobit model. The marginal coefficients of different explanatory variables are derived utilising the

parameter estimates of the Tobit model and the mean values of the explanatory variables separately for three forms of business organisation. These coefficients are presented in Table 2.

Table 2: Tobit Estimates of Export Share Equation and Marginal Coefficients

			Marginal Coefficients		
Variable		**β**	**Proprietorship**	**Partnership**	**Limited Co**
(1)		(2)	(3)	(4)	(5)
Constant		-0.4727	-1.2608	-1.1307	-0.4727
Scale (x_1)	(Rs. crores)	0.0166	0.0051	0.0095	0.0163
Technical efficiency (x_2)	(ratio)	1.4325	0.4419	0.8185	1.4104
Wage share (x_3)	(ratio)	-1.2146	-0.3747	-0.6940	-1.1959
Share of sales expenses (x_4)	(ratio)	1.6195	0.4996	0.9254	1.5946
σ		0.3535			
Φ (β′X/ σ)			0.3085	0.5714	0.9846

As mentioned in the earlier section, marginal coefficients are proportional to the parameter estimates. Multiplicative factor specific to each form of business organisation is indicated in the last line of Table 2. This factor is the lowest for single proprietorship firms, the highest for limited companies with that for partnership firms lying in-between. In other words, compared to an average single proprietorship firm, the marginal impact any single explanatory variable is 85 per cent higher for an average partnership firm and as high as 219 per cent for an average limited company. We interpret this to mean that the form of business organisation reflecting access to finance and technology as well as scale advantage is clearly a very important factor governing export performance.

We first take up for discussion, the marginal coefficients of wage share, technical efficiency and share of sales expenses as all these three variables are measured in same units and hence their absolute magnitudes can be compared with each other.

The sensitivity of firm level export performance turns out to be the highest with a positive marginal coefficient with respect to the share of sales expenses in total gross output. This reflects the fact that in the buyer-driven consumer chain that is characteristic of the garment industry, ability to access branded merchandisers, trading companies or large

retailers abroad gets reflected in a higher sales expenses per unit of (physical) output in relation to unit value of output. The impact of an identical increase in the share of sales expenses on export performance goes up in moving from proprietorship to partnership firms to limited companies. At an average level, a unit rise in the share of sales expenses produces 50, 93 and 159 per cent improvement in the export performance of proprietary concerns, partnership firms and limited companies respectively. Since access to finance and hence scale of operation goes up across forms of business organisation, the rising magnitude of the marginal coefficient is possibly reflective of scale economies in accessing international markets.

Next in quantitative magnitude is the sensitivity of the firm level export performance to the technical efficiency. That technical efficiency matters for competitive advantage of firms is verified by the positive and statistically significant coefficient of this variable in the estimated equation (4). Table 2 brings out that the marginal impact of technical efficiency on export performance rises steadily across the three forms of business organisation. On an average, a unit increase in technical efficiency index leads to 44, 82 and 141 per cent rise in the export share of a proprietary concern, partnership firm and limited company in that order. Positive impact of technical efficiency on the share of exports in production means that there exists scope for firms to raise exports even in the short run with the given input combination and technology simply by reorganising themselves so as to reduce wastage and extracting more out of existing technology. And the higher magnitude of the impact reinforces the importance of reorganisation so as to use technology better and compete well in the international markets.

As expected the marginal coefficient with respect to the share of wages in total gross output is negative and third in order in terms of absolute magnitude. Among the three forms of business organisation, an equal reduction in wage share produces a higher impact on the export performance of limited companies followed by that of partnership concerns and proprietary firms in that order. Marginal coefficients indicate that on an average, a unit decrease in the share of wages gives rise to 37, 69 and 119 per cent hike in the share of exports in proprietary concerns, partnership firms and limited companies respectively. A reduction in wage share should not be narrowly interpreted in terms of a reduction in wage rate or work force or both. Rather, our discussion in section 2 brings out and further

confirmed in section 3 that exporting units are more efficient users of (the economy-level relatively abundant factor) labour and pay *both* (skill-adjusted) higher wage *and* employ larger number per unit so long as both together make a more than proportionate contribution to overall productivity per unit of labour at the firm level. This in turn, can be attributed to the possible organisational flexibility offered by the modern small scale industrial units classified by the original value of plant and equipment below a certain ceiling level. This segment in a labour intensive industry marked by wide diversity in skill and machinery combinations, is characterised by reasonably free entry and organisational possibilities of getting around restrictive labour legislation that constrict labour market flexibility in the Indian organised manufacturing sector.

Marginal coefficient of scale in the export performance function is positive as expected. But it is small in magnitude (as it is dependent on units of measurement) though statistically significant. Positive and statistically significant marginal coefficient of scale implies that *scale of operation matters even within the segment of small scale industrial units.* The impact of scale on the export performance is higher for limited companies than that for other two forms of business organisation as can be seen from table 2. This result has important implications for the policy of reservation of garment industry for the exclusive production in the small scale sector which does not permit entry of large scale organised units.[29] Its importance is more so given the fact that limited companies contribute substantially to garment exports and these companies are larger in scale compared to the other two forms of business organisation. [30]

7. Summary and Concluding Observations

In this paper, drawing on the international trade and industrial organisation theories, we identified firm-specific factors that govern a firm's decision to export or sell in a domestic market as also those that influence a firm's export performance by imparting competitive advantage. Using this reasoning, we estimated export decision function as well as export performance function for the Garments and Apparel producing units located in Delhi on the basis of unit-level data for the year 1987-88.

The industry taken up for study supplies non-branded varieties in bulk quantities to the international buyer-driven chains where the market is competitive in terms of both quality and price and hence cost competitiveness is critical for exports. We identified scale of operation, ability to access capital in a material-intensive industry (approximated by form of business organisation) and ability to access, establish and expand connections to international buyer-driven chains (as captured in the share of sales expenses in gross output) as the variables relevant for export decision function. In addition to these factors that also impart competitive cost advantage, we considered technology (as incorporated in the wage share of gross output) and technical efficiency which can be established only on the basis of actual performance as other factors that enter as arguments in export performance function.

After assessing the empirical validity of the identified factors by cross-classifying units across forms of business organisation and exporting and non-exporting character, export decision function has been estimated using Probit model and export performance function with the help of censored regression or Tobit model. Estimated parameters of both the functions have been found to be statistically significant with expected signs.

In the estimated export decision function, the marginal impact of the chosen variables (scale of operation and share of sales expenses) has been found to decline sharply in moving from single proprietorship to partnership and further to limited companies. Notice that the average probability of finding an exporting unit is the lowest in proprietary concerns, goes up significantly for higher scale partnership firms and the highest in case of limited companies. In view of this, a declining magnitude of the impact of scale and share of sales expenses on raising the probability of exporting at the margin across forms of business organisation only to be expected. In the estimated export performance function, on the other hand, the marginal impact of every single determinant tends to increase across forms of business organisation in going from single proprietorship to partnership to limited companies. Clearly, access to capital approximated in form of business organisation enhances the impact of the same variable on export performance. The form of business organisation has thus been found to be critical in explaining inter-firm export performance. Given the form of business organisation, the absolute magnitude of marginal coefficient of share of sales expenses has been found to be the highest followed by that of technical efficiency and wage share in that order. We interpret this to mean that firm-level efforts in accessing international distribution chains, in

adopting better technology and in utilising the existing technology more efficiently play a significant role in imparting competitive cost advantage to firms in international markets.

Results indicate that impact of scale of operation (whose magnitude is small because of its dependence on unit of measurement) is statistically significant and increases across forms of business organisation. Scale turning out to be important even among small scale units implies that garment exports can be increased by permitting large scale firms in the production of garments as they are in a better position to reap economies of scale in bulk purchase of materials (recall high material intensity of units), raise finances and possess ability to access international buyer-driven chains and successfully compete in a market that is both quality and price sensitive. Permitting entry of large firms and expansion in scale of operation of existing firms would facilitate the upgradation of at least some of them from high volume, unbranded low unit-value segment to branded, quality-sensitive, high unit-value varieties. There is no need to worry about the employment implications of the rise in size as our results clearly bring out that even among the small scale units, not only do larger exporting firms absorb higher work force per unit but also pay higher (skill-adjusted) wages than non-exporting firms. They manage to do it by adopting superior technology that raises per worker productivity. However, over protective existing labour legislation applicable to larger scale factories is an impediment in the flexible utilisation of labour which constitutes probably the most important source of international competitiveness in a labour-abundant economy like India.

Our results show that while the existing organisation of industry characterised by exclusive production in a large number of small scale units makes it possible to get around the constricting effects of existing labour legislation in India that applies to large scale units , scale of operation directly as well as indirectly through other variables such as forms of business organisation exerts a strong positive impact on export performance. Since healthy export expansion is critical to the viability of balance of payments of a globalising economy like India, our findings strongly suggest two major changes in government policy for this purpose, namely, abolition of reservation of products in small scale units and simultaneous appropriate amendments in labour legislation to introduce labour market flexibility for large scale factory units. In a labour intensive industry operating in competitive export markets, it is important to permit individual units to find optimal size with respect to competitive

advantage rather than subjecting those units (as the Indian policy makers have done) to policy-induced constraints on the scale of operation.

While discrete jumps in technological innovations in products and processes are indeed essential to sustain and expand exports in the long run, incremental improvements in technical and organisational efficiency (i.e. movement nearer to the frontier) as also in labour usage as well as in sales efforts can contribute positively to exports in the short run. Government should provide enabling environment to induce these changes which are possible in the short run while providing the firms with appropriate incentives to improve their long run competitive advantage in the world markets.

In conclusion, it should be apparent that the determinants of the export decision and export performance functions that we have identified on the basis of international trade and industrial organisation theories and found empirically relevant to the Garment and Apparel industry would also apply to other labour intensive exportable industries.

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APPENDIX -A

Measurement of Technical Efficiency

In this section we discuss the measurement of technical efficiency using stochastic production frontier model. Let the production function be

$$Y = f(X)\ e^{-u} \qquad \text{.....(1)}$$

From (4.1) e^{-u} can be written as

$$e^{-u} = Y / f(X) \qquad \text{.....(2)}$$

i.e., the ratio of observed output (Y) to maximum producible output [f(X)]. Thus, e^{-u} can be taken as a measure of technical efficiency. As the production function is expected to represent the maximum producible output, the observed output (Y) would always be less than or equal to maximum output so that $0 \leq e^{-u} \leq 1$. We rewrite (1) in log-linear form

$$\ln Y = \ln [\ f(X)\ ] - u \qquad \text{.....(3)}$$

so that $0 \leq u \leq \infty$. Hence, an appropriate way of estimating a production function is to treat u as a random variable with $(0, \infty)$ range and drawn from a one-sided statistical distribution. By assigning a suitable statistical distribution to u, we can estimate the parameters of the distribution along with the parameters of production function. In this way production function represents a frontier as given by its definition. This frontier model is employed to estimate technical efficiency. We make this frontier stochastic by giving provision to the random errors. To start with, Translog functional form is specified to this frontier as it is the most widely used flexible functional form[31] and we have considered three inputs namely, capital, labour and energy for the analysis. Accordingly, the production frontier is written as

$$\ln Y = \alpha_0 + \alpha_k \ln K + \alpha_l \ln L + \alpha_e \ln E + 1/2\ \gamma_{kk} (\ln K)^2 + \gamma_{kl} \ln K \ln L$$

$$+ \gamma_{ke} \ln K \ln E + 1/2\ \gamma_{ll} (\ln L)^2 + \gamma_{le} \ln L \ln E + 1/2\ \gamma_{ee} (\ln E)^2 + \varepsilon \qquad \text{.....} \quad (4)$$

Where, Y = Value of production,

K = Fixed capital,

L = Total employees,

E = Value of energy consumed and

$\varepsilon = v - u$ is composed error term.

It is assumed that $v \sim N(0, \sigma_v^2)$ is a two-sided error term representing the usual statistical noise. Inclusion of v makes the frontier stochastic by allowing the random

effects on production. $u \geq 0$ is one-sided error term representing the technical efficiency. It is assumed to have been drawn from the Exponential distribution. Accordingly, probability density function of u is written as

$$f(u) = \exp(-u / \sigma_u) / \sigma_u \quad \text{.....} \quad (5)$$

conditional mean of u can be derived from the moments of residuals as below

$$E(u/\varepsilon) = \sigma_v [(f(A) / 1 - F(A)) - A] \quad \text{.....} \quad (6)$$

where $A = (\varepsilon / \sigma_u) + (\sigma_v + \sigma_u)$

Frontier is estimated using the maximum likelihood method. Technical efficiency (TE) is calculated as $1 / \exp [E(u / \varepsilon)]$.

In the estimation, we exercised choice with reference to a given data set in two dimensions, namely, choice between alternative specifications of the frontier and choice between a single frontier or separate frontiers for the three forms of business organisation. For this purpose, we followed a two step procedure. In the first step, we carried out an econometric test for choosing between Translog and Cobb-Douglas specifications with regard their appropriateness for the data set. Since Cobb - Douglas is a restricted form of Translog, we tested the relevant restrictions on the Translog parameters to accept/ reject the Cobb - Douglas specification. Given this choice, the next step proceeded to determine whether or not three separate frontiers for the three forms of business organisation (single proprietorship, partnership and limited companies) are to be considered. In the first step, based on the relevant F-statistic being significant, Translog specification is accepted. See table 6 in the appendix B for the test statistics in this respect. Also see table 5 in the same appendix for the parameter estimates of different specifications of the frontier function. In the second step, the validity of the common Translog frontier for three forms of business organisation is established as the frontier could not be estimated for the limited companies group.

APPENDIX - B

Table 1: Readymade Garment Exports of India 1981-82 to 1994-95

Rs. Crores

Years	Garment Exports	Total Exports	Share of (%) (2) in (3)
(1)	(2)	(3)	(4)
1981-82	669.80	7798	8.59
1982-83	629.30	8788	7.14
1983-84	734.60	9738	7.54
1984-85	948.30	11705	8.10
1985-86	1096.10	10847	10.10
1986-87	1503.00	12417	12.10
1987-88	1999.50	15611	12.81
1988-89	2278.10	20148	11.31
1989-90	3472.20	27681	12.54
1990-91	4639.64	32555	14.25
1991-92	6282.35	44042	14.26
1992-93	8840.75	53688	16.47
1993-94	11648.06	69752	16.70
1994-95	13921.62	82609	16.85

Source: Textile Commissioner. *Compendium of Textile Statistics*. 1995

Table 2: Distribution of Indian Exports of Readymade Garments by Destination 1987-88 to 1994-95

Figures given are percentage shares

Country	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1987-91*	1991-95*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Australia	1.19	1.48	1.40	1.05	1.15	1.28	1.32	1.29	1.25	1.28
Benelux	4.47	4.67	4.47	4.78	4.31	4.99	5.14	4.88	4.62	4.89
Canada	2.71	2.86	2.88	2.77	3.04	2.72	2.90	3.05	2.81	2.93
Denmark	0.96	0.85	1.05	1.01	0.89	0.82	0.83	1.21	0.99	0.97
France	6.92	6.74	6.76	6.67	6.87	6.95	6.62	6.66	0.75	66.74
Germany	14.18	13.73	15.25	15.93	13.93	13.32	12.69	12.53	15.05	13.01
Italy	6.33	4.15	3.52	3.31	4.00	5.16	4.22	5.12	4.01	4.70
Japan	2.22	2.66	3.22	3.15	4.44	3.56	3.23	3.35	2.93	3.53
Switzerland	2.41	2.40	2.66	2.87	2.92	3.15	3.05	2.38	2.65	2.82
Sweden	1.40	0.90	1.40	1.66	1.91	1.88	2.47	2.90	1.41	2.33
U.K.	10.96	9.70	11.80	11.64	10.09	11.57	10.04	9.50	11.22	10.20
U.S.A.	31.93	32.62	21.40	24.39	26.16	27.42	24.99	28.24	26.29	26.81
U.S.S.R (CIS)	8.66	9.97	8.34	7.62	4.68	2.42	5.57	4.22	8.42	4.29
U.A.E.	0.56	1.24	3.07	3.90	4.80	4.33	4.57	2.99	2.64	4.01
Others	5.04	6.05	12.80	9.25	10.81	10.42	12.19	11.89	8.98	11.49
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source is the same as given in Table 1.

* gives the average of the all those years.

Table 3: Revealed Compared Advantage Indices for Indian Garment Exports 1978 to 1992

Years (1)	SMOG (2)	SWOG (3)	RMOG (4)	RWOG (5)
1978	0.72	2.30	1.52	4.85
1979	0.38	3.27	0.87	7.53
1980	0.40	3.49	1.00	8.62
1981	0.33	4.80	0.88	13.00
1982	0.26	3.20	0.66	8.00
1983	0.45	4.88	0.98	10.69
1984	0.52	4.48	1.13	9.75
1985	0.62	5.35	1.41	12.16
1986	0.51	4.37	1.20	10.14
1987	0.51	4.12	1.08	8.74
1988	0.57	3.88	1.15	7.82
1989	0.58	4.06	1.01	7.16
1990	0.44	3.43	0.85	6.60
1991	0.47	3.40	0.92	6.60
1992	0.40	3.56	0.72	6.37
ROG	0.896	0.987	-1.149	-1.078

Notes:
SMOG = %age share of India's exports in world exports of Mens Outer Garments
SWOG = %age share of India's exports in world exports of Women Outer Garments
RMOG = Revealed Comparative Advantage Index for Men Outer Garments
RWOG = Revealed Comparative Advantage Index for Women Outer Garments
ROG = Exponential Growth Rate per annum.
Source: UN: *International Trade Statistics Year Book*. Various Issues.

Table 4: Mean Values for the Scale of Operation and Structural Ratios of the Textile Garment Industry

Values are in Rs'000

Category	Units	Scale of Operation		Capital Intensity		Labour Productivity		Factor Shares			WR
		PRD/U	L/U	FK/L	TK/L	VA/L	PRD/L	WS	MS	SSE	
1	2	3	4	5	6	7	8	9	10	11	12
Proprietorship											
Exporting Units	47	10151	42	34.536	39.616	114.810	269.470	0.07	0.60	0.15	11.200
		(1.21)	(1.33)	(0.98)	(0.97)	(1.26)	(0.86)	(0.94)	(0.30)	(0.77)	(0.90)
Non-Exporting	85	743.600	9	19.141	22.687	17.460	70.020	0.19	0.55	0.05	5.804
Units		(2.15)	(0.73)	(0.86)	(0.84)	(0.99)	(1.21)	(0.98)	(0.51)	(1.36)	(0.60)
Partnership											
Exporting Units	58	18816	64	30.833	46.477	120.360	349.330	0.07	0.65	0.13	11.499
		(1.28)	(0.94)	(1.02)	(1.16)	(1.55)	(1.29)	(1.39)	(0.24)	(0.83)	(0.66)
Non-Exporting	64	2569.600	18	20.007	24.712	30.888	114.210	0.11	0.66	0.08	6.081
Units		(2.37)	(1.31)	(0.93)	(0.91)	(1.02)	(0.76)	(1.21)	(0.32)	(1.58)	(0.39)
Ltd. Companies											
Exporting Units	52	20270	65	47.523	58.477	106.070	321.330	0.07	0.64	0.12	10.880
		(1.87)	(0.76)	(0.68)	(0.75)	(2.01)	(1.68)	(1.16)	(0.22)	(0.77)	(0.46)
Non-Exporting	4	6865	46	48.869	56.082	83.719	182.640	0.08	0.60	0.14	10.429
Units		(0.45)	(0.42)	(0.52)	(0.51)	(0.83)	(0.61)	(0.75)	(0.25)	(0.69)	(0.60)
All-Exporting	157	16704	58	37.469	48.398	113.970	316.150	0.07	0.63	0.13	11.205
Units		(1.63)	(0.97)	(0.89)	(0.97)	(1.62)	(1.36)	(1.19)	(0.25)	(0.80)	(0.69)
Non-Exporting	153	1667.5	13	20.280	24.407	24.809	91.450	0.15	0.60	0.07	6.041
Units		(2.58)	(1.28)	(0.89)	(0.88)	(1.15)	(0.98)	(1.09)	(0.43)	(1.53)	(0.53)
All Units	310	9283	36	28.986	36.557	69.963	205.250	0.11	0.61	0.10	8.656
		(2.26)	(1.31)	(0.97)	(1.05)	(2.00)	(1.62)	(1.23)	(0.35)	(1.09)	(0.75)

Source: DCSSI. Second Census of Small Scale Industrial Units, 1992

Notes: Figures in parentheses are coefficients of variation
PRD = Value of production; U = No of Units; L = No of employees; TK = Total Capital; FK = Fixed Capital; VA = Value added; WS = Share of Wage bill in production; MS = Share of materials in production; SSE = Share of sales expenses in production; WR = Wage rate per person per annum;

Table 5: Parameter Estimates of Different Specifications of Stochastic Production Frontier Model

Specification	Cobb-Douglas frontier with half-normal distribution for the error term	Translog frontier with the exponential distribution for the error term	Translog frontier with half-normal distribution for the error term
α_o	2.8687 (2.65)	2.2012 (2.25)	2.8179 (2.43)
α_k	0.4990 (7.76)	-0.0941 (-0.25)	-0.0309 (-0.09)
α_e	0.7487 (7.54)	1.2620 (2.15)	1.3660 (2.28)
α_e	0.1849 (2.71)	1.1425 (2.99)	0.9343 (2.46)
γ_{kk}	--	0.0423 (0.80)	0.0373 (0.73)
γ_{kl}	--	0.1003 (0.81)	0.0789 (0.61)
γ_{ke}	--	-0.115 (-1.50)	-0.0861 (-1.13)
γ_{ll}	--	-0.0536 (-0.35)	-0.0467 (-0.29)
γ_{le}	--	-0.2835 (-1.82)	-0.2874 (-1.78)
γ_{ee}	--	0.1309 (2.05)	0.1310 (2.02)
η	--	310	310

Notes 1: Cobb-Douglas Frontier: $\ln Y = \alpha_o + \alpha_k \ln K + \alpha_l \ln L + \alpha_e \ln E + \in$
2. Translog Frontier is specified in appendix A
3. Figures in Parentheses are t-ratios

Table 6: Test Statistics for choosing Between Cob-Douglas and Translog Frontier Specification.

Nature of Restictions on the Parameters of Translog: $\gamma_{kk}=\gamma_{kl}=\gamma_{ke}=\gamma_{ll}=\gamma_{le}=\gamma_{ee}=0$

No of Restrictions (r): 6

Restricted (Cobb-Douglas) Residual Sum of Squares (RRSS)=267.85

Unrestricted (Translog) Residual Sum of Squares (URSS) = 246.09

No of Observations (n): 310

No of Parameters (k) = 10

Degrees of Freedom (df) = n-k=310-10=300

F-statistic : F6,310=[(267.85-246.09)/6]/[246.09/300]
= 4.4211>2.10(critical value)

The null hypothesis of Cobb-Douglas Specification has been rejected.

Table 7: Parameter Estimates of the Probit Model

Variable	Parameter estimates of		
	Homoscadastic	Heteroscadastic	variance
(1)	(2)	(3)	(4)
Const.	0.3618	0.5630	
	(1.218)	(0.606)	
Scale	0.9692	2.3587	0.6318
	(6.469)	(1.741)	(5.460)
exs	2.4270	1.2819	
	(3.221)	(1.534)	
d1	-1.3070	-1.3219	-0.7626
	(-4.250)	(-2.283)	(-1.361)
d2	-1.3595	-1.5631	-0.5169
	(-4.428)	(-3.146)	(-0.948)
logl	-134.20	-111.87	
LRI		0.48	
LR test stastic		44.66	
LM test stastic		130.027	
n	310	310	

Notes: Scale = value of production in Rupees crores;
exs = Share of sales expenses in value of production;
d1 = intercept dummy for proprietorship;
d2 = intercept dummy for partnership;
Figures in parantheses are t-values;
Dependent variable y = 1 for exporting units
= 0 for non-exporting units.
LRI = Log-likelihood ratio index used as a measure of goodness of fit.

Table 8: Parameter Estimates of the Tobit Model

Variable	Parameter estimates of		
	Homoscadastic	Heteroscadastic	Variance
(1)	(2)	(3)	(4)
Const.	0.4757	-0.4727	
	(0.581)	(-0.704)	
Scale	0.0578	0.0166	
	(3.003)	(1.810)	
te	0.0566	1.4325	
	(0.054)	(1.608)	
exs	1.9590	1.6195	
	(5.395)	(4.527)	
ws	-1.6291	-1.2146	
	(-3.067)	(-2.913)	
d1	-0.6175	-0.7881	0.7314
	(-5.185)	(-6.185)	(3.628)
d2	-0.5037	-0.6580	0.8179
	(-4.459)	(-5.845)	(4.505)
logL	-245.45	-232.85	
LR test stastic	--	25.2	
LM test stastic	--	157.526	
n	310	310	

Notes: 1.scale = value of production in Rupees crores; te=technical efficiency; exs=share of sales expenses in production; ws=share of wage bill in production; d1,d2=dummy variables; EI=share of exports in production is the dependent variable; n=number of observations;

[1] Section 3 discusses the data base.
[2] See Table 1, col. 4 in the appendix.

[3] Chatterjee and Mohan (1993).
[4] Report on the Second All-India Census of Small Scale Industrial Units, p. 119.
[5] Bhagawati (1988).
[6] In fact it was one of the most influential studies that led to the first round of export pessimism in less developed nations as Nurkse expected external demand to go down over time because of a variety of factors.
[7] Panoutsopoulos (1992), Tables 2.3 to 2.6, pp.18-22.
[8] Initially non-tariff trade barriers like quotas were taken to constrain the export expansion of developing countries which resulted in increased support to the doctrine of export pessimism in these countries. See Bhagwati *op.* cit., and Panoutsopoulos *op. cit.*, p.44. Later studies showed that this was not true. See Bhagawati *op. cit.*, pp. 42 & 43.
[9] Panoutsopoulos *op. cit*., p. 30 gives some references in this regard.
[10] See Table 2 in the appendix.
[11] Product diversification is possible because quotas allotted to India for some products like bed linen, towels and other made-ups remained unutilised. See *Foreign Trade Review.* October, 1991.
[12] Khanna (1991), pp. 77-78. Ramaswamy and Gereffi (1998) observe that specialisation in terms of products has been practised by the garment exporting countries.
[13] For instance Chatterjee and Mohan, op. cit., show that US increased its base level quotas for India by 17 per cent in 1987 and again by another 18 per cent in 1988.
[14] For a convenient survey of literature, see Warr (1994).
[15] RCA index is measured as the ratio of the share of the given product exports in a country's manufacturing exports to the share of the product in world manufacturing exports (Yeats 1990). RCA indices for the two products namely, women outer garments and men outer garments are presented in Table 3 in the appendix.
[16] Khanna *op. cit*., pp. 77 - 78.
[17] The production of Ready-made Garments has been reserved for small scale units officially defined in terms of the ceiling limit on the original value of investment in plant and machinery which has been revised upwards over time. This was opened for large scale undertakings through a notification dated July 29, 1993 subject to an investment in plant and machinery not exceeding Rs. 30 millions and an export obligation of 50% of its production. (Economic Survey 1993-94, p. 93). However, with the recent hike in the ceiling limit on the original value of investment in plant and machinery to Rs. 30 millions to define small scale units, all the firms in the industry come under the (redefined) catergory of small scale units.
[18] Forsund *et. al*. (1980) and for the latest review on the subject see Fried, *et. al*. (1993). Estimation procedures for the frontier and efficiency indices are given in the appendix A.
[19] Kilby (1962) and Leibenstein (1966) discuss how these factors affect the efficiency of firms in detail.
[20] Liability of a single proprietor or partners is unlimited in the sense that it extends beyond the business assets and also covers privately owned and business unrelated property which can be attached for paying the debtors in case of bankruptcy. Similarly, if one member of partnership leaves, or dies, the identity of partnership and hence business is automatically dissolved. If the business is to be continued a new entity must be formed. Same is the case with the proprietorship firms.
[21] de Alessi (1988) and Carr and Mathewson (1988).
[22] Ramaswamy and Gereffi (1998), Lall (1991) and Egan and Mody (1992).
[23] Its importance in the case of Indian exports had been stressed long ago by Manmohan Singh (1964), p. 25.
[24] The numbers in parentheses immediately following the industry names in this section are National Industrial Classification (NIC), 1973 code numbers for the respective industries.
[25] At two-digit level, Hosiery and Garments (26) industry had 808 units in Delhi which contributed 16 per cent of the total industrial production of Delhi in 1987-88 and occupied second position next to Electrical Machinery, Parts and Apparatus. Of 808 Hosiery and Garment units in Delhi, 207 units exported output worth Rs. 2813.2 million and accounted for nearly 73 per cent of exports by all small scale industrial units in Delhi during 1987-88. Ready-made garments (264104005) tops the list of 2075 products that were being manufactured by the small industrial units during the year 1987-88, accounting for 13.7 per cent of the total industrial production in the union territory. See the *Report on the Second Census of Small Scale Industrial Units for Delhi*, pp. 34,85 and 105.
[26] In the process of data cleaning using consistency checks, we had droped 85 observations. The remaining 310 observations have been used for econometric analysis.
[27] Green (1993), pp. 639.
[28] *Ibid*., 695.
[29]Production reservation does not permit the existing small scale industrial units to grow even when it is warranted by considerations of efficiency improvements. Together with other concessions made available only

to the small scale industrial units, they generate incentives and vested interest in remaining small and inefficient. See Tendulkar and Bhavani (1997) for the critique of the government policy for the small scale industry.

[30] Carr and Mathewson, *op. cit,*. show that limited companies are usually associated with larger size.

[31] Some of the flexible functional forms are generalised Cobb-Douglas, generalised Leontief, generalised Quadratic form, etc. Of these, "...the translog form has been widely used as a framework for analysis of structural properties of production." Fuss, et.al. (1978) pp.237-39.