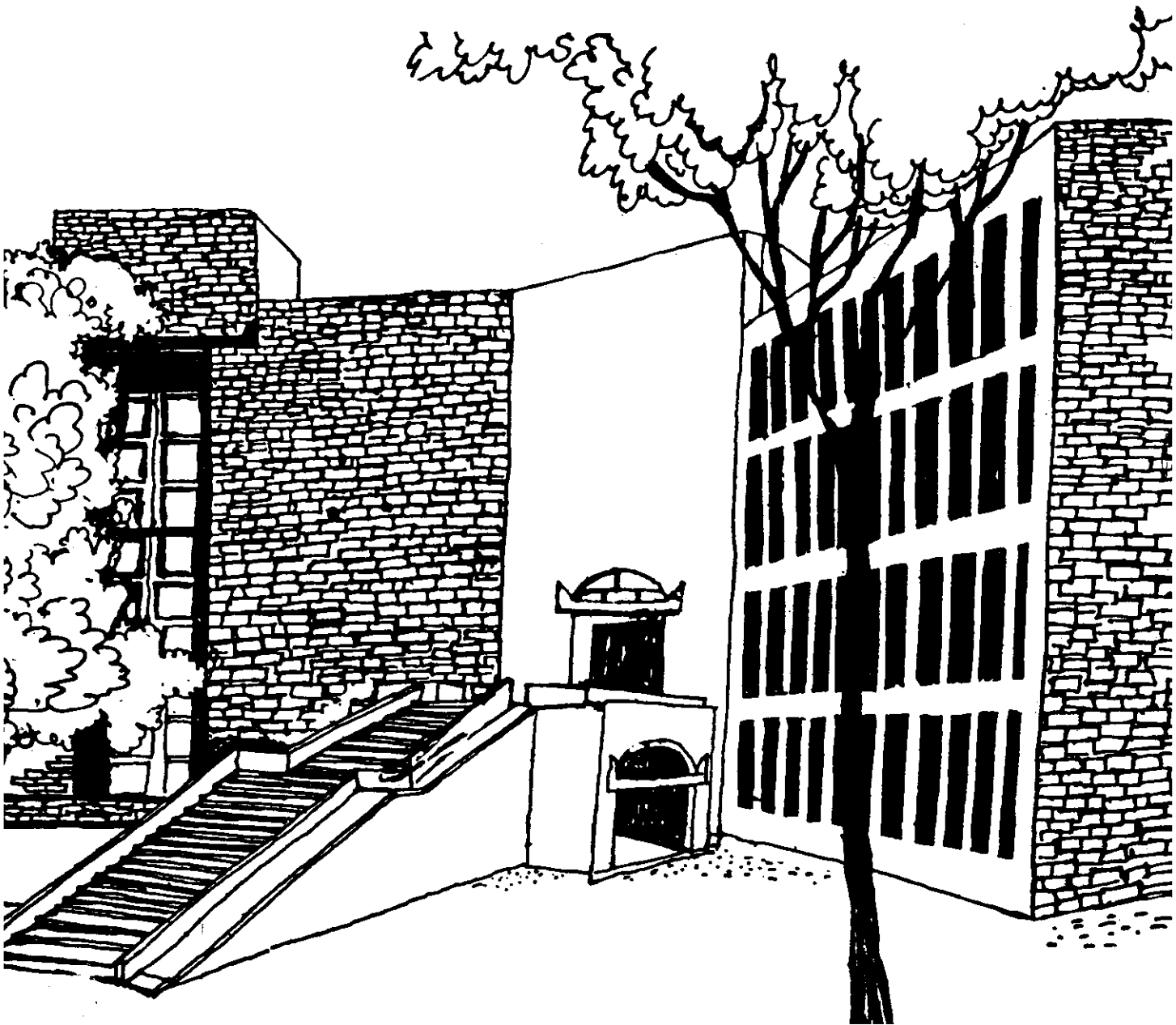




Working Paper



**FIRM SIZE AND EXPORT BEHAVIOUR
IN A DEVELOPING COUNTRY**

By

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Firm Size and Export Behaviour in a Developing Country

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Abstracts

In the context of Indian industry, this paper argues that in the presence of capital market imperfections and sub-optimal contractual arrangements, small firms face higher transaction or selling costs in the domestic market. One of the strategic responses by small firms towards overcoming the mobility barriers imposed by high transaction costs in the domestic market is to break into the competitive world market. Small firms that could realize a critical level of production efficiency and possible information externalities that arise through inter-firm linkages might be the ones that could succeed in exports. The empirical observations derived from the analysis of firm level survey data provide reasonable support to the main arguments.

Firm Size and Export Behaviour In a Developing Country

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I. Introduction

The basic argument of several empirical studies that postulate positive association between firm size and firm level export intensity is that large firms should fare better than small firms in exports because of the importance of economies of scale in production, R&D expenditure, risk-taking abilities and possible price discriminatory behaviour of large firms [Hirsch and Adar (1974), Auquier (1980), Glesjer et al (1980), for a review of literature see Berry (1992); Caves (1989)]. In recent times there has been growing evidence of the effective role of small and medium scale (S&M) firms in exports,

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especially in the context of Taiwan's experience ¹ [Levy (1988) and (1991), Young (1990)]. Taiwan, in pursuit of export oriented growth, promoted small and medium scale firms which became highly agile exporters in many low and high technology industries.

In India's inward oriented economy, a complex array of domestic demand and supply side factors govern export behaviour of large and small firms because of pervasive domestic product and factor market imperfections and sub-optimal economic institutions. In pursuit of heavy industrialization, the macro economic policies were made to be systematically biased in favour of large scale firms. In order to compensate for the macro policy bias against the small scale sector, a battery of micro level assistance programmes were directed at it [Little et al (1987), Meade (1991), Patibandla (1993)]. Consequently, in many Indian industries, a few large and a large number of small firms coexist and play a role in exports. For example, in 1983/84, 27.4 per cent of total engineering industry exports were accounted by the small scale sector (see Table 1). In many individual industries the share was even higher. This is rather remarkable as 80 to 90 per cent of total output of most of the industries was accounted by large firms [Desai (1982), World Bank (1989)]. ² A few previous empirical studies on Indian industry have observed negative association between firm size and export intensity [Lall and Kumar (1981), Siddharthan (1986), Patibandla (1988)]. This was explained by the argument of long run domestic market power and resultant X-inefficiency of

¹ Industrial districts in mid-Italy are also good examples of the dynamic role of S&M scale firms in exports. See Bonaccorsi (1992).

² The World Bank's (1989) study of Indian industry shows that 55 per cent of industrial segments in India had four firm concentration ratios in the 80-100 per cent range, while in Japan only 9 per cent of segments had reached this degree of concentration.

Table 1
Small Scale Industry Exports
Indian Engineering Industry.

	(Rupees in million)		
	1981/82	1982/83	1983/84
Total Engineering	3180	3400	3210
	(30.3)	(27.2)	(27.4)
1) Bicycles and parts	260	220	150
	(47.2)	(55)	(33.3)
2) Diesel engines and parts	300	288	210
	(37.5)	(48)	(42)
3) Steel tubes and parts	68	51	30
	(17.7)	(17)	(17.0)
4) Hand, small and cutting tools	133	146	150
	(23.2)	(31.2)	(33.3)
5) Machine tools	79	86	100
	(32.2)	(30.7)	(33)
6) Steel structures (fabricated)	102	102	100
	(35.1)	(34)	(33.3)

Note: Small scale industry is taken as defined by the Government of India prior to 1985: firms with net assets not exceeding Rs.4.5 million.

Figures in brackets are the percentage share of small scale industry exports in total industry exports.

Source: Confederation of Engineering Industry Year Book, 1985.

large firms.³ But the underlying factors governing export behaviour of small firms might be quite complex, especially in the context of Indian industry. One explanation given by Patibandla (1988) is that, in certain Indian engineering industries, many sub-contractor small firms branched out into export markets in order to reduce their dependence on a few large firm buyers and to avoid unfavourable terms of contracts with respect to monopsony buyers in the home market.

Following from the above observation, market transactions costs in terms of selling output and terms and conditions of contracts between sellers and buyers could be one of the important underlying factors of the domestic market power dimension in determining export behaviour of large and small firms in Indian industry.⁴ This could be especially true when large and small firms

³. It is generally argued that large firms, owing to their domestic market power, could use super normal profits made in the domestic market to subsidise exports. Therefore they should export at higher intensity than small firms (Hirsch and Adar (1974)). This argument may not be valid in the case of many Indian industries because a large firm might find it more profitable to spread capital available to a wide range of protected industries rather than expand in a single industry through exports [Patibandla (1992)].

Secondly, the argument that since small firms are competitive fringe and price taker firms in the domestic market they could sell freely at a given domestic market price might not be applicable to countries like India with relatively small domestic markets. Any attempt by a small firm to grow in the domestic market could be punished by (the multi-product) large firms through restrictive practices like cross-product subsidization [Patibandla (1994)].

⁴. In determining industrial structure and exports, transactions costs might operate differently in different countries depending on the institutional mechanism and capital market imperfections. Levy's (1991) study of the Taiwanese and South Korean footwear industry attaches significant importance to market transaction costs in explaining the evolution of industrial structure by examining sub-contractor relations. He observes that reciprocal entry by traders and small manufacturers appear to have progressively reduced the transaction costs of search and negotiations and thereby contributing to sustained expansion and export performance of the Taiwanese industry.

are equally efficient, in the absence of economies of scale, in production.⁵ In the presence of severe capital market imperfections and sub-optimal institutions (and also many missing markets) the Indian economy, in general, can be observed to be a high transaction cost one. As a part of the domestic market power argument, high transaction costs work in favour of large firms in the domestic transactions. ⁶ Large corporate firms which have higher access to capital at lower price could invest substantially in promotion and developing domestic brand names and reputation which provides them a relative advantage in transactions specific to the protected domestic market.

On the other hand, small firms even if they are equally (or more) efficient in production might face a relative disadvantage in the domestic market because of their lack of brand names and their inability to invest in high costs of domestic market transactions. For example, as observed by this author from the field interview of firms, small firms have to wait for payment on their domestic deliveries for long periods because of inadequate contracts and low bargaining power. This, in turn, results in higher costs of working capital for small firms. A small firm that has access to information about overseas buyers and meets product quality and delivery time requirements might perceive doing business with overseas buyers less costly than in the home market as the terms and conditions of contracts for exports tend to be more

⁵ The empirical studies of Page (1984) and Little et al (1987) of Indian industry, on the basis of extensive survey data, have found no significant (econometric) association between firm size and firm level relative technical efficiency in production for three out of four industries. This would imply that large and small firms realize equal level of technical efficiency in production.

⁶. In other words (as institutional economics show) high transaction costs could be one of the dominant sources of long run domestic market power (to large firms) and expansion and mobility barriers (to small firms).

favourable. In such a case, one of the strategic responses by small firms can be to branch out into export market as a means of overcoming the mobility barriers imposed by high transaction costs in the domestic market. Those small firms that could reach a critical threshold size and efficiency in production and could make use of possible information externalities⁷ that arise through inter-firm linkages might be able to break into export markets and export at higher intensity.

This paper takes into account market transaction or selling costs and possible information externalities in explaining export behaviour of large and small firms in Indian industry. It provides empirical tests of the basic propositions. The empirical exercises are based on cross section firm level data drawn from an Indian engineering industry at (SITC) disaggregate classification. The data was collected from an extensive field survey across the country for the year 1983/84. The main issues of this paper are derived from the qualitative information collected from the field interviews of firms.

This paper is organized as follows. Section II uses a simple theoretical model to put forward the crucial issues. The model characterizes the strategic interdependence of firms in the protected domestic market in Cournot quantity competition. Firms are taken to be price takers in the world market on the basis of the assumption of small country in the world market. Cost function of firms is taken to be separable into costs of production and costs of selling output. The justification for the separability of the cost function arises out

⁷ Information and other possible externalities in exports are generally significant in highly export oriented countries such as Japan, South Korea and Taiwan [Pack and Westphal (1986)]. In the inward oriented Indian economy, these externalities might be less significant. But they might be present in relatively export oriented Indian industries such as garments, footwear and a few metal-based industries like hand tools.

of the main argument of the paper that, in the presence of capital market imperfections and sub-optimal transaction contracts in the domestic market, there could be significant asymmetries in the costs of selling output across large and small firms. Asymmetries in these costs could be one of the dominant factors in determining export behaviour of large and small firms in Indian industry. The model shows that when large and small firms are equally efficient in production, small firms face higher selling costs in the domestic market but in the competitive world market where all firms are more or less on an equal footing, small firms export at higher intensity. Section III presents the empirical test of the propositions of the model. Concluding remarks are given in Section IV.

II. The Model

The domestic market is protected from imports. There are no imports in the system.^a Firms are taken to compete in Cournot quantity space in the domestic market and to be price takers in the competitive world market. The technology of production is non-increasing returns to scale. The production cost curves can be taken to be 'U' shaped, i.e. if there are increasing returns, they vanish after a level of output. This assumption is justified and consistent with stylized facts that increasing returns to scale are insignificant in most Indian industries [Page (1984), Little et al (1987), Patibandla (1992)]. There are market transaction or selling costs to firms in the protected domestic market and export market. The domestic market demand curve is taken to be linear.

The profit function of firms facing protected domestic and competitive

^a. Most Indian industries are heavily protected from imports.

world markets is;

$$\pi_i = P(X_{-i} + x_i)x_i + P^*x_i^* - (1/2)c_i(x_i + x_i^*)^2 - a_i x_i - b_i x_i^* \quad (1)$$

where $i = 1, 2, \dots, N$.

$$X_{-i} = \sum_{i \neq j}^N x_j$$

'P' is the domestic market price. 'x_i' is domestic market sales, 'x_i^{*}' is exports of firm 'i'. 'c_i' is the parameter of the cost function of producing total output of firm 'i'. 'a_i' and 'b_i' represent (constant marginal) selling or transaction costs in the domestic and export markets respectively.⁹ The possible asymmetries in these costs will be explained at a later stage. By solving (1) for the first order profit maximization conditions we obtain:

$$P^* - b_i = P(i) + P'(i)x_i - a_i = c_i(x_i + x_i^*) \quad (2)$$

From (2) domestic sales in equilibrium can be expressed as

$$x_i = [P^* - P(i)]/P'(i) + (a_i - b_i)/P(i) \quad (3)$$

$P'(i) < 0, P(i) > P^*$.

Exports,

$$x_i^* = [(P^* - b_i)/c_i] - x_i \quad (4)$$

By substituting (3) into (4), exports in equilibrium can be expressed as

$$x_i^* = (P^*/c_i) - [P^* - P(i)]/P'(i) - (b_i/c_i) - [(a_i - b_i)/P'(i)] \quad (5)$$

It can be observed from (5) that the relative advantage of firms in $(a_i - b_i)$, i.e. the differences in costs of selling in the home and export markets, and in 'c_i', i.e., costs of production, are the determinants of relative export intensity of firms.¹⁰ In discussing possible asymmetries in

⁹. These functions are taken to be linear for the sake of analytical simplicity.

¹⁰. 'a_i' can also be taken to represent the degree of domestic market power of firms. Firms with lower 'a_i', as it can be seen from (2), realize

$(a_i - b_i)$ across large and small firms in Indian industry, we take 'i' to represent a domestic corporate entity or large firm and 'j' to represent a small (or unknown new entrant) firm.¹¹

It is of general view that costs of selling in export markets are higher than costs of selling in domestic markets because of factors like transport costs, higher uncertainty and costs of information acquisition associated with exports, which are supposed to provide large firms a relative advantage over small firms in exports [Auquier (1980), Glesjer (1980)]. But in the case of industries like footwear, garments, and certain metal based light engineering industries (like hand tools) there may not be significant economies of scale in export marketing and small firms can be in a position to undertake exports. In this paper, we take ' b_j ' to capture possible information externalities in exports to small firms that can arise through inter-firm linkages.

The important question of this paper is whether $(a_i - b_i) < (a_j - b_j)$ and whether this asymmetry is dominant in Indian industry. As mentioned earlier in Section I, large firms in Indian industry might have a significant relative advantage over small firms in selling their output in the domestic market because of their ability to develop domestically well-known brand names through substantial investment in advertising and promotion and also in formulating and enforcing contracts with both private and public sector agents

higher marginal revenue on domestic sales.

To focus on the issue of asymmetries in $(a_i - b_i)$, we assume ' c_i ' to be symmetric across large and small firms which can be justified by the empirical studies of Page (1984) and Little et al (1987), as noted earlier.

¹¹. A corporate entity can be taken to be the one that has nationally known brand name and reputation, operating in different industries. Most Indian industries were dominated by a few large corporate houses with highly diversified industrial activities and domestically well known brand names.

in the high transaction cost Indian economy.¹² The relative disadvantage of small firms in the domestic transactions is explained by the following example. As derived from the qualitative information of the field interviews, small firms with low bargaining strength find the terms and conditions of contracts with respect to domestic (wholesale and also large firm) buyers unfavourable and highly costly. Several times they have to wait for payment on their domestic sales from a minimum of six months to a maximum period of even two years. This, in turn, makes costs of working capital on domestic sales very high, especially as small firms get access to capital at significantly higher rate than large firms [Patibandla (1993) and (1991)]. This is a very significant factor because most small firms tend to have a very high percentage of bought-in inputs (or relatively low value-added), their working capital needs tend to be higher than that of large firms which are generally more vertically integrated¹³ [Patibandla (1994)]. This causes 'a; < a; '. Several small firms responded in the field interviews that they branched out into export markets because the terms of contracts and payment for their deliveries were more favourable in exports than in domestic sales. Once they formulated a contract with an overseas buyer they could receive payment for delivery of output promptly through the letters of credit. This makes a big difference to these firms because of the constraints and high costs they face in raising working capital. The crucial issue, here, is that the high

¹². In selling their output to public sector units, large firms could effectively bribe and influence the officials. Furthermore, in Indian industry where government intervention had been high, large firms could effectively corner certain licenses and subsidies. See Bardhan (1984).

¹³. One common observation that comes out of the vast literature on India's small scale industry is that constraints in the availability of working capital is a dominant cause of incidence of sickness among small firms. See Sen (1991).

transaction costs could be one of the dominant sources of mobility barriers to small firms in the domestic market. Consequently, exports would be perceived by small firms as a means of overcoming the mobility barriers arising out of the high transaction costs of the domestic market. ¹⁴

The following issue is whether ' $b_i \geq b_j$ '. In this context, small firms might be able to free ride on possible information externalities of large firms in export activity. In many Indian industries most large firms, although they might be mostly inward oriented, tend to have an export market presence. ¹⁵ Large firms' investment in export markets could be a source of information externalities to small firms.

If there are information externalities in exports to small firms, they might operate through inter-firm linkages. Firms that actively interact with other firms might get exposed to information about export markets. These externalities reduce not only costs of information acquisition but also the perceived risk of small firms in exports. Inter-firm linkages can be in two ways- 1) sub-contractor activity between large and small firms which is prevalent in many Indian industries [Annavaiahula (1988), Nagraj (1984), Patibandla (1988)] and 2) managers who previously worked with a large firm and

¹⁴ There are other indirect benefits of export activity to small firms like access to foreign exchange and increase in status as an exporter with respect to domestic agents which help them to be more viable in the domestic market.

¹⁵ Some of the underlying reasons for export activity of large firms, as gathered from the field interviews, are as follows. 1). Long term export presence was viewed as an instrument of reducing risks of domestic market fluctuations. As one can not enter export markets all of a sudden at the onset of domestic recession it is necessary for these firms to have a long term export market presence. 2). Export activity functions as a window to the world market and exposes them to new products and advertising methods which, in turn, helps them to grow in the protected domestic market through diversification.

branched out on their own as small firm producers and exporters.¹⁶

In Indian industries such as footwear, hand tools, and electronics, there is a significant level of sub-contracting activity between large and small firms. Large firms buy finished and semi-finished products from small and medium scale firms and resell them under their brand names [Annavajhula (1988), Nagaraj (1984)]. If the relative advantage of large firms in 'a_c', i.e. selling costs in the domestic market, is very dominant in comparison to their costs of production, it will be profitable for them to buy semi-finished and finished products from small firms and resell them under their brand names.¹⁷ A sub-contractor small firm might be able to get access to information regarding possible overseas buyers, product quality requirements, and terms and conditions of export sales through its linkage with a large firm which has export presence. These externalities, in turn, could facilitate the (subcontractor) small firms to break into export markets.

III. Empirical Analysis

The following empirical exercises are based on cross-section firm level data and are taken to provide certain empirical regularities. Because of limitations in the available firm level data and in measurement of relevant variables, we make use of certain proxy variables. For example, the relative

¹⁶ This is quite prevalent in the Indian garments industry. A large number of small firm exporters (in Delhi and Bombay) are the ones who previously worked as export marketing managers for large firms.

¹⁷ If there is a significant fixed cost element to large firms in marketing and domestic market brand name creation or advertising, their average selling costs decline as they sell more units.

Annavajhula's (1988) intensive study of the sub-contractor activity in the Indian TV industry showed that it had been highly profitable to large firms to buy output from small firms and resell it under their brand name (usually at a far higher price).

selling costs advantage of large firms in the domestic market is taken to be captured by advertisement expenditure. A dummy variable that distinguishes sub-contractor small firms in the sample is taken to capture the argument regarding information externalities in exports that take place through inter-firm linkages.

The empirical exercises are aimed at testing the following propositions:
(1) If $(a_i - b_i) < (a_j - b_j)$ and if this effect is dominant, small firms export at higher intensity than large firms. Large firms that could undertake substantial advertisement expenditure towards developing domestic brand names and consequently derive relative advantage specific to the protected domestic market export at lower intensity. In other words, small firms that face mobility barriers arising out of high selling or transaction costs in the domestic market, export at higher intensity. (2) Small firms which have inter-firm linkages through sub-contracting activity should export at higher intensity than others because of possibility of information externalities.

III.i. Data

Comprehensive firm level cross-section data was collected for the year of 1983/84 through a field survey of firms belonging to an Indian engineering industry i.e. hand, small and cutting tools industry. For large public limited companies the company balance sheets were also used. Information regarding sub-contractor links of small firms was collected through field interviews. The sample for the econometric exercises consists of 76 firms. The firm size distribution of the sample, in terms of sales turnover, ranges from a maximum value of Rupees (Rs) 1592 million to a minimum value of Rs. 0.7 million.

III.ii. Variables.

(E/S) = Exports to total sales ratio as the firm level export intensity

variable

S = Firm size in total sales turnover, normalized by the lowest value in the sample

AD = Firm level advertising expenditure

DI = Dummy variable that takes a value of '1' for small firms with sub-contractor links and '0' for the rest of the firms in the sample.

C = Firm level relative production efficiency variable.

'C' is measured on the basis of Farrell's (1957) (deterministic) production frontier approach by taking a two-input [labour (L) and capital (K)] production function. The methodology of measuring 'C' is explained briefly in the following.¹⁰ The production relation can be expressed as

$$Y = (X:B) + u$$

where 'Y' is a vector of output observations, 'X' is a matrix of input observations, 'B' represents the parameters and 'u' represents the one-sided error. The one-sided error forces $Y \leq f(X)$. In the general estimation of production functions, 'u' is specified to be normally and identically distributed with zero mean and finite variance. Frontier estimations take 'u' to have a negative expectation indicating presence of (technical) inefficiency in production. If we impose a Cobb-Douglas production function on the above form, it can be specified as

$$Y = f(X) e^{-u}$$

$$\log Y = \log f(X) - u$$

where $u \geq 0$ and thus $0 \leq e^{-u} \leq 1$ and where $\log f(X)$ is linear in the Cobb-Douglas case. It is assumed that 'X' is exogenous, and independent of

¹⁰. For a detailed explanation of this methodology see Forsund et al (1980), p. 11-12.

'u'. As suggested by Richmond (1974), the above specification can be estimated by ordinary least squares (OLS) by simple modification. If we let 'w' be the mean of 'u', we can write;

$$\log Y = (\alpha_0 - w) + \sum_{i=1}^n \log X_i - (u_i - w)$$

where the new error term has zero mean. The error term satisfies all the usual properties except normality. The above specification can be estimated by OLS to obtain the best linear unbiased estimates of $(\alpha_0 - w)$ and α_i . The estimated residuals can be used to correct the OLS constant. The constant term can be corrected by shifting it up until no residual is positive and one is zero. The extent of the deviations of the rest of the observations can be used to estimate firm level relative production efficiency indices. Translog production function is used in estimating the efficiency indices (see appendix).

III.iii. Results

As a preliminary exercise, the following econometric equation (1) presents the OLS estimation of association between export intensity, firm size, ¹⁹ and production efficiency variables.

$$(1) (E/S) = 0.17 - 0.00016(S) + 0.15 (D)$$

$$(2.8)* \quad (2)* \quad (1.2)$$

$$R^2 = 0.09 \quad F = 3.3 \quad N = 76$$

Figures in brackets are 't' values

* Significant at 0.01 level

The above result shows a statistically significant association between export intensity and firm size and statistically insignificant association

¹⁹. This type of specification where export intensity as exports to sales ratio regressed against sales as firm size variable appeared in Glesjer et al (1980) and Lal and Kumar (1981).

with respect to the production efficiency variable. But the above specification can be questioned on two grounds. (1) As the theoretical model shows exports (E) and sales (S) are endogenous variables and 'C' is an exogenous variable. In the above specification 'S' enters the right hand side of the equation. (2) Firm level sales values enter as the denominator of the dependent variable and also enter the right hand side as the firm size variable. If there are measurement errors in (E) and (S) there could be spurious correlation. Furthermore, for a quite a few number of firms, especially small firms, in the sample, exports take zero values. If the observations of the dependent variable are clustered around zero, the OLS estimates provide biased estimates of the coefficients. The following equation (2) avoids these problems and uses Tobit maximum likelihood method of estimation. The Tobit technique uses all observations both those at the limit of zero values and those above it in estimating the regression line [see Maddala (1983)].

Equation (2) takes the production efficiency variable (C), advertisement expenditure variable (AD), and the dummy variable (D1) which distinguishes sub-contractor small firms as independent variables (as suggested by the model in Section II) in explaining export intensity (E/S). As small firms do not incur any advertisement expenditure, AD variable takes zero values for small firms in the sample.²⁰ To recapitulate, the underlying theory of (AD) variable is that large firms which are able to undertake substantial amount of advertisement expenditure should be able to develop domestically well-known brand names and derive a relative advantage in domestic sales. Therefore, they

²⁰. In other words, AD variable functions as a binary (or qualitative) variable that differentiates between large and small firms in the sample.

should export at lower intensity. The results for equation (2) are as follows;

$$2). (E/S) = 0.38 (C) - 0.000012(AD) + 0.21 (D1)$$

(3.3)* (1.51)** (2.6)*

Standard error of the estimate = 0.24

N = 76

Figures in brackets are 't' values.

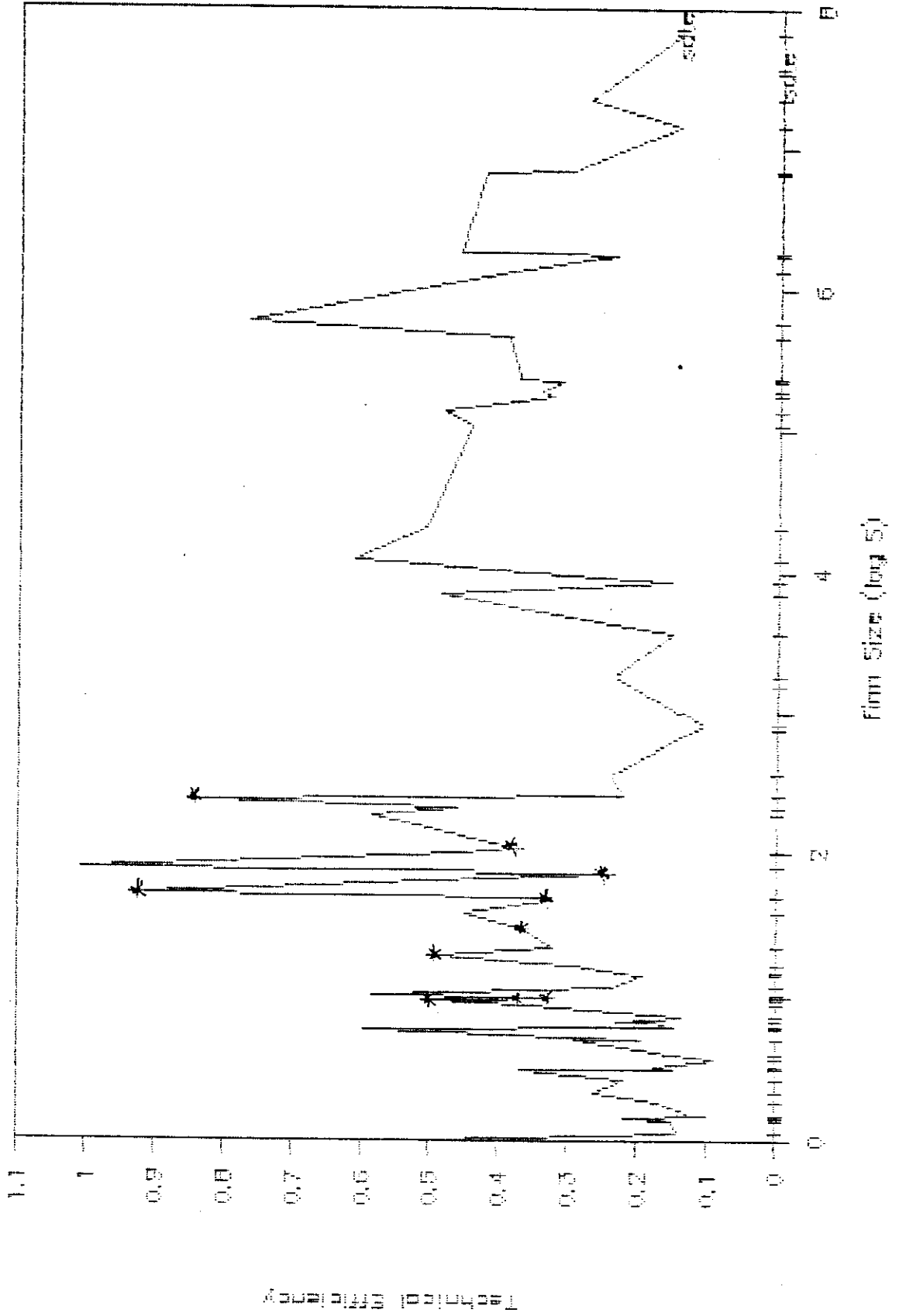
* Significant at 0.01 level. ** Significant at 0.05 level.

The results of equation (2) show a meaningful level of statistical significance. The respective signs of the estimated coefficients provide reasonable support to the main propositions. The positive sign of the estimated coefficient of the variable (C) implies higher export performance is associated with higher relative production efficiency. The negative sign of the estimated parameter of AD variable supports the argument that large firms which could undertake advertisement expenditure would be able to derive relative advantage specific to the protected domestic market. As a result, they export at lower intensity than small firms. The positive sign of the estimated coefficient of the dummy variable (D1) implies that small firms with sub-contractor links have higher export intensity than the rest of the firms in the sample. As discussed in Section II, sub-contractor small firms might be in a better position to take advantage of information externalities in exports that might take place through inter-firm linkages. This should help these firms to break into export markets and export at high intensity.

Figure 1 shows the plot of the estimated firm level relative production efficiency indices against firm size (reduced to natural logs). The observations with '*' signs represent sub-contractor small firms in the sample. As it can be observed from the figure, the sub-contractor small firms

FIG. 1

Technical Efficiency and Firm Size



belong mostly to the larger size group of small firms. Their average production efficiency level is 0.51 (with a standard deviation of 0.2) which is far higher than the average efficiency level for the total sample which is 0.34 level (with a standard deviation of 2.2). This observation along with the results of equation II can be interpreted as those small firms that could reach a critical threshold size and production efficiency level and take advantage of information externalities which arise through inter-firm linkages might be the ones that succeed in exports.

III. Conclusion

This paper has brought out a few highly relevant issues in explaining firm size and export behaviour in Indian industry by using a simple theoretical model. The model takes firms to compete in Cournot quantity space in the protected domestic market and to be price takers in the competitive world market. The cost function of firms is taken to be separable into costs of production and costs of selling output. The justification for this is derived from the main argument that, in the presence of capital market imperfections and sub-optimal transactional contracts, there could be significant asymmetries in the selling or transaction costs across large and small firms in the domestic market. This approach helps in highlighting a few important factors that explain the export behaviour of large and especially small firms in Indian industry.

The domestic market power argument in explaining negative association between firm size and export intensity in Indian industry has generally been used in very broad terms. But the underlying factors of the domestic market power dimension could be quite intricate, especially in the context of Indian industry characterized by pervasive market imperfections and sub-optimal

economic institutions.

It has been argued in this paper that small firms even if they are equally (or more efficient) in production as (than) large firms, face a relative disadvantage in the home market sales due to mobility barriers arising out of high home market transaction costs caused by sub-optimal contractual arrangements and capital market imperfections. Those small firms that have access to information about export markets might find doing business with overseas buyers less costly than in home market. In other words, exports might be perceived as a means of overcoming the mobility barriers arising out of the high transaction costs of the home market. Those small firms that could reach a critical threshold size and production efficiency and make use of possible information externalities might be able to break into export markets and export at higher intensity.

The empirical exercises are based on cross section firm level survey data drawn from an Indian engineering industry. A few of the crucial issues of this paper are based on the qualitative information collected through field interview of firms. Certain proxy variables are used in the econometric exercises because of limitations in measuring the selling or transaction costs of firms. The econometric results provide reasonable support to the main propositions.

It has been argued in the paper that there could be information externalities in exports to small firms arising out of inter-firm linkages like sub-contracting activity. An empirical proof of this possible outcome has been presented. But this issue requires further research with more survey data and information.

Appendix

The estimated translog production function for the sample is presented in the following. 'Y' refers to value-added, 'L' refers to labor employed (salaries and wages paid) and 'K' refers to capital (in historical costs).

$$\log Y = 5.4 + 1.12 \log L - 1.02 \log K + 0.33(1/2) \log L^2$$

$$(2.1)* \quad (2.68)* \quad (2.2)* \quad (2.68)*$$

$$+ 0.42 (1/2) \log K^2 - 0.3 \log L * \log K$$

$$(2.22)*$$

$$(2.12)*$$

$$R^2 = 0.94 \quad F = 220 \quad N = 76$$

Figures in brackets are 't' values.

*. Significant at 0.01 level.

The estimated function is checked at all data points for monotonicity and is observed to be well behaved.

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