Journal of Quantitative Economics, Vol. 9 No. (2), July 2011

DETERMINANTS OF EXPORT DECISION OF INDIAN FIRMS: A PRIMARY DATA ANALYSIS

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Abstract

This paper reports the findings from a purposive survey of 400 firms across different regions in India and in selected industry segments. It analyses the factors determining firms' decision to export and their performance, in particular, the role of infrastructure constraints and internal costs. These include physical, financial and human infrastructure; trade costs, tariffs, institutional factors such as conflict resolution, political stability, corruption, anti-competitive practices, macroeconomic policy, labour regulation, and intensity of competition, etc. The findings of this paper are relevant to the broader debate on Indian economic development. From a policy perspective the paper contributes to an exploration of the relative importance of infrastructure constraints and domestic costs on exports. It emphasizes the distinctive features of India's past path of development and suggests its possible future course of action.

Keywords: Export performance, Firm-specific effect, principal component, internal & external barriers, physical infrastructure, financial infrastructure, institutional factors, dummy, Tobit and OLS.

JEL Classifications: F13, F14, F21.

1. Introduction

An earlier paper (Srinivasan and Archana, 2010) contributed to an analysis of trade flows on the decision of firms whether to export. It analysed the determinants of export decision of Indian firms using secondary data. This paper uses the primary data to look further into the constraints and incentives on participation in exports based on a purposive survey of 400 firms. The survey had broad objectives. Besides exploring factors that could influence export capabilities of a wide spectrum of the manufacturing industry in India, the survey was designed to throw light on the incentives and constraints on firms in entering and exporting to different

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We deeply appreciate the support of Dr. Rajiv Kumar, Ex-Director and Chief Executive, ICRIER. I also gratefully acknowledge the valuable comments of Professor Stephen Redding and Professor Peter Schott, Yale University, USA, on our working papers. A special thanks goes to Loknath Acharaya, who is responsible for helping in data work.

markets as well as the impact of firms' productivity and profitability on the probability of their exporting or otherwise. The paper breaks new ground in analysing India's trade liberalisation from a micro perspective.

Among the issues the survey was designed to address were the influence of ownership (e.g. domestic and foreign) and shareholding (e.g. private and government) status of the firms on their export performance and of finance, internal costs, infrastructure (physical, social and financial) constraints, technology (to access the foreign market), government regulations, labour relations, government incentives and international barriers (tariffs and others). These factors could be significant in influencing the export decision of firms and their significance is assessed from the responses of firms to the survey questionnaire. The survey started with a broadly-based but purposive sample from Prowess firm-level data (CMIE) of the centre for Monitoring the Indian Economy. The Prowess database contains information primarily from the income statements and balance sheets of about 9,500 publicly listed companies, almost 5,000 of which are in the manufacturing sector. Although the data are believed to cover almost all registered firms in operation, there is no assurance that this is indeed the case and thus do not provide a well-defined frame for drawing random samples. This is a serious limitation of the data and our sample.

Our sample includes only those Indian exporters who are manufacturers from nine industry segments chosen for the purpose. During the field operations, several firms declined to respond or responded only partially, since according to them the questionnaire was too elaborate and included questions which required inside information, some of which was very sensitive. Although other firms were added to replace the non responding firms to bring the sample to the designed size (400 firms) and its distribution across the nine chosen industrial segments, still a potential selection bias in our sample could not be avoided.

The sample of 400 firms were located in different locations in all regions, north, south, east and west of India and by selected industry segments. To ensure a reasonable representation of firms from each manufacturing sector, we selected our sample firms using industry as strata. The number of firms from each industry (stratum) was roughly proportional to the relative shares of the industry in the manufacturing exports of the country. Our sample is by no means a random sample of the universe of firms from each stratum and was chosen to be a purposive sample. The serious limitations from the non-randomness of our sample on our inferences have to be kept in mind.

The number of final respondents from each industry segment, conforming broadly to the basic proportions assigned to various industry segments, is given in the Table 1.

Since the number of respondents was small in some segments, besides being potentially non-random, inferences about these segments are not reliable.

The field operations of the survey were centered at Delhi and other areas of the National Capital Region in the North; Mumbai, Pune and Ahmedabad in the West; Kolkata in the East; and Chennai and Bangalore in the South. The chosen firms were not all located at each centre of field operations but from several locations around the centers and thus covered the whole country. Out of the 400 firms surveyed, nearly three-fifths (56 per cent) turned out to be private limited companies, followed by partnership and sole proprietorship firms at 12 per cent each. Public limited companies constituted only one-fifth of the total sample, of which companies not listed in the country's stock exchanges outnumbered the listed ones by 2%. In terms of export

performance of the industries and the establishments covered, private limited companies appear to be relatively better placed in our data.

Table 1. Distribution of Respondent Firms

Industry Segment	*Respondents*	*Proportion*
Minerals and Fuels	81	20.25
Gems and Jewellery	85	21.25
Textiles	95	23.75
Metals	39	9.75
Machinery	39	9.75
Chemicals	28	7
Plastics	5	1.25
Pharmaceuticals	7	1.75
Leather and products	21	5.25
Total	**400**	**100**

Review of Literature

Although the empirical literature on India's exports performance is long standing and vast, few of the studies are based on data at the firm-level and they are fairly recent. The available firm-level empirical studies on India, for instance, of Lall and Kumar (1981), Kumar and Sidhdarthan (1994), Patibandla (1995), Bhavani and Suresh (2000), Aggarwal, (2002), Raut (2003), Hassan and Raturi (2003) and others, analyse the effects of factors, such as firm's age, firm size, R&D expenditure , import intensity, product differentiation and labour productivity on its export performance.

Aggarwal (2002) in her study shows that export performance was strongly related to firm size and imports of materials and components. After allowing for increasing liberalisation of the economy over time and for exchange rate variations, affiliates of Multinational enterprises (MNEs) were found to have performed better than local firms in the export markets. She uses the Capital Line database, which provides financial statistics of firms listed on the stock exchange. She extracted the data from it for five years i.e. from 1996 to 2000. This yielded 4211 observations for 970 firms. One of the limitations of the Capital Line database is that it does not include firms that are not listed on any Indian stock exchange. Another limitation of her study is the reverse causality problem. An increase in export performance can lead to an expansion of firms' size because the market is enlarged, and vice versa. She does not attempt to correct for the possible bias due to this endogeneity through econometric techniques.

Raut (2003) starts with a theoretical model and its empirical specification at the firm level as a Tobit model. He uses data on a sample of 415 Indian private firms during the period 1975-1986. Data on variables such as net sales, fixed assets, and wages and salaries were taken from Bombay Stock Exchange Directory and data on exports and imports from Ministry of Company Affairs. He finds that firm size had a significant positive effect on exports. The imported capital goods and in-house R&D had limited impact on exports, but import of raw materials and competitiveness were found to be the most important determinant of exports. One limitation of the study is the use of the firm-level data dependent on more than one, and rather unrelated sources

for estimating the export performance. This raises doubt on the reliability and also comparability of Raut's estimates.

Tushar Poddar (2004) analyzes data from a panel of Indian firms in the CMIE Prowess data base. He finds evidence to show that liberalization has led to increasing domestic competition which in turn led to increasing firm efficiency, thereby increasing firm's ability to export. Export growth is also an outcome of local firm innovation which in turn is a response to increased competitive pressure the entry of foreign forms through easing of foreign direct investment (FDI). The study showed that liberalization and trade reforms of 1991 and devaluation of exchange rate gave impetus for exports. The limitation of this study is possible sample selection problems as the data do not include small and unregistered firms.

Lall and Kumar,1981, collected data from the Reserve Bank of India (RBI) on the balance sheets of 1720 medium and large private companies for the year 1980. They find smaller firms to be more export oriented in the restrictive regime and than larger firms, but after a point of time may have less of an incentive to export. Kumar and Sidhdarthan (1994), in their study of the annual reports of publicly listed firms available with the RBI also argue that an inverted "U" type relationship exists between size and exporting behavior for 640 Indian firms from the years 1988 to 1990. They find no such relationship between foreign ownership and export performance. However these two studies use data prior to 1991 when the policy was to restrict foreign equity ownership in India. All their findings are based on policies of the 1980s which were hesitant, partial and limited in scope and coverage of liberalization. Patibandla's(1995) study covered a cross-section of firms in the engineering industry from a survey conducted under the auspices of the Centre for Indian Industry (CII). He finds a negative relationship between firm size and export intensity. It is likely that all the studies mentioned in this paragraph suffer from potential sample selection biases on unknown magnitudes.

A recent study by Chibber and Majumdar (1999) finds that firms which possess foreign ownership of 51% and above in India show superior exporting performance. Their study also suggests that large and more profitable firms are more likely to export in the post 1991 liberalization period. The results of this study is based on data on more than 800 firms collected from the Center for the Monitoring of the Indian Economy (CMIE) , Bombay Stock Exchange and the office of the Registrar of Companies in the Department of Company of the Ministry of Law, Justice and Company Affairs of the Government of India. As in Raut (2003) the data used for estimating the export performance depend on more than one unrelated source. Another limitation is that it analyzes cross-sectional, rather than time-series data. In principle, for analyzing the impacts changing patterns of ownership and firm performance, data over a long time period would have been better. Further temporal causality cannot be evaluated without time series data. Potential endogeneity arising from reverse causality, for instance an increase in export performance can lead to an expansion of firms' size and vice versa, is a problem.

Although all these studies use the secondary sources that provide rich information for their firm level analysis, primary data would have helped corroborate their findings. Export performance of a firm is influenced not only by quantifiable factors of its own characteristics but also others faced by it, including factors relating to the business environment in the industry of the firm. A combination of primary and secondary data would enable a more informed analysis of the determinants of the export decision of the firms. This is what we attempt to do.

2. Descriptive Analysis of Survey Data

The analysis is from the perspectives of industry and export performance. Export intensity, as an indicator of export performance, is defined and measured as the share of exports in total sales turnover of each firm, and expressed in percentage terms. Its range (0-100 per cent) is grouped into four: (a) Below 10 per cent (b) 11 to 25 per cent (c) 26 to 50 per cent (d) Over 50 per cent.

2.1. Firm Characteristics

2.1.i. Ownership Pattern of the Firms

Data in Table 2[3] clearly show that the ownership stakes of Indian private investors in Indian firms are very high, with 96% reporting stakes of over 70%. In pharmaceuticals, leather, textile and plastics, private investors hold high stakes (over 70%). In others it is even higher in the range of 92-98%. Only 4% of exporting firms have private stakes below 70%.

Table 3 shows that in only 1% of firms, the stake of government exceeded 70% and in 90% of firms government had no stake at all. It turned out (data not presented here) that in pharmaceuticals, leather, textiles and plastics, there were no government ownership. Firms with export intensity of over 50% (except in metals) had less than 10% government stakes.

Only 5% the firms had some foreign ownership, with 3% having less than 30%. There was no foreign ownership in pharmaceuticals, leather and Plastics. Given that there was little foreign ownership in our entire sample it is no surprise the same is true across all export intensities. In part foreign ownership in Indian firms reflects government restrictions that vary across industries and time on such ownership.

2.1.ii. Size of the Firm

More than half (52%) of the firms are independent units operating on their own. Of the remaining, 30% of the units are part of a small business group (of two firms). 45% are part of groups with 2 to 5 units, as compared to only 3% which have more than 5 units in the group.

2.1.ii.a. Employment Structure

Table 5. Employment ***(Responding firms %)***

	Employment ranges			
	<30	**31-50**	**51-100**	**>100**
Minerals & fuels	-	6	41	53
Gems & Jewellery	8	48	38	6
Metals	3	3	45	50
Machinery	5	15	48	33
Chemicals	4	18	50	29
Pharmaceuticals	-	-	80	20
Leather	5	10	57	29
Textiles	-	6	34	60
Plastics	-	-	100	-
All	**3**	**16**	**42**	**39**

[3] With the exception of Table 5 and Table 15 in the descriptive analysis we are not presenting the data on industry segment. They are available on request from vaniarchana@yahoo.com.

Only 3% of firms that had less than 30 employees, with 81% of firms employing at least 50. Thus in terms of employment most of our firms are relatively large. All respondent firms in plastics and 80% in the pharmaceutical segments reported their employee strength to be between 51 and 100. More than half of the firms in minerals and fuels, metals and textiles segments have each reported more than 100 employees per firm.

The distribution of firms by employee strength seems similar across all export intensities.

2.1.ii.b. Assets of Firms

Of all the firms, in terms of their assets 16% were small, 32% were medium and 48% were large sized firms. All the firms in plastics have total assets in excess of Rs 50 crores. Most other segments with this high range of total assets varied from 33% in leather to 54% in minerals and fuels. Two segments, with larger share of firms with assets exceeding Rs. 50 crores, are chemicals (68%) and pharmaceuticals (80%). For all export intensity categories individually and over all, larger firms dominate, accounting for 44% to 54% of firms.

2.1. iii. Age of Firms

A large proportion of firms (81%) are less than 50 years old. Only 15% were less than 10 years old and even fewer, 4% were more than 50 years. Export intensity is highest for the few old firms (more than 50 years) across all export intensity categories.

2.1.iv. Technology Introduction and Research and Development Spending

Interestingly more than 75% of the firms reported having introduced new technology within the last 3 years, with the proportion varying from 64% in the lowest export intensity category to78% in the highest. About 9 out of every 10 firms in leather have acquired new technology in last 3 years as compared to 84% in Gems & Jewellery, 82% in metals and 80% in pharmaceuticals. Firms with newer technology have export intensity over 50% as compared to those with older technology. All firms in Mineral & fuels, Metals and Gems& Jewellery that have export intensity of more than 50% have acquired new technologies

Only 22% of the surveyed firms reported having spent anything on R&D, with 78% not responding and presumed to have spent nothing. Of the 22% of firms that spent on R & D, large majority of 14% respondents spent between 0.5% and 1% of their sales. Among these, a high of 43% firms were in leather and surprisingly a low 20% in pharmaceuticals. The corresponding proportion in others varied between 11% and 17%. Most other are in the range of 11% and 17% firms spending 0.5% to 1% of their sales on design and R&D.

Preferences of the responding firms were also sought on sources of technology acquisition. These included (a) acquired machinery and equipment; (b) transfer from parent company; (c) acquisition from (i) domestic, and (ii) international sources; and (d) in-house development. Firms appeared to have used more than one source.

Technology is considered by all firms as important for business operations, with little variation across industry segment. In many segments, a large share of firms (over 50% in each of the segments), considered acquisition of technology as very important.

2.1.vi. Experience in Exporting

In each of the export intensity categories (and overall) firms with long exposure over 5 years to foreign markets dominate, ranging from 70% to 92%, with 18% with medium term export experience (3 to 5 years) and 4% with short experience (up to 2 years), Those with less than 5 years of experience have relatively low export intensities.

2.1.vii. Share of costs and profits in sales and export intensities

For 50% of firms, costs did not exceed sales revenue and they therefore made profits. Of these, 40% made a gross profit before taxes of more than 20% on sales, and of these as high as 51% had export intensity of 11% to 25%. Another 4% of firms reported total cost in the range of 80% - 90% of sales and 6% in the range of 90% - 100%.

Expressed differently, of the 37% of the 50% of profit making firms, 24% realized a net profit after tax at a rate exceeding 5%, 5% at a rate between 2% and 5% and the remaining 8% at a rate less than 2%. In all 80% of the firms in pharmaceuticals, 31% in textiles have reported net profit (less tax) to sales in excess of 5%.

2. 2. Incentives

2.2.i. Export Promotion Subsidy Schemes

Table 15. Export Promotion Subsidy and Export Intensity

Export Intensity %	*Below 10%*	*11-25%*	*26-50%*	*Over 50%*	*All*
Receivers	86	81	70	85	76
Non Receivers	14	19	30	15	24
Total	100	100	100	100	100

Of the firms surveyed 76% received subsidies under export promotion scheme. Firms receiving subsidy in various industry segment performed well, with export intensities in the range of 26 to 50%, including 78% of firms in gems & Jewellery 75% in pharmaceuticals and 65% in leather. In others the ratio was around 50%.

Across all industries and categories of export intensity the firms that received export promotion subsidies do not dominate, suggesting that the subsidies did not induce firms to increase the share of exports in their sales.

2.3. Barriers to Operations and Exports

2.3 .i. Infrastructural Barriers

a. Telecommunications

A major portion (71%) of firms across all industry segments considered telephone as very important to operate their business. More than half of the responding firms do not consider inadequacy or inefficiency of telecommunication as an obstacle to their operations. However 31% of the respondents do find it as a minor obstacle. 7% consider it as a moderate obstacle.

b. *Electricity Supply*

About 44% reported electricity supply as a minor or moderate obstacle. 35% considered it as major problem, of which 8% found it to be a very serious obstacle to their operations. Nearly half (44%) of the firms felt that the supply was limited in quantity, and another 35% indicated it to be of poor quality. The position varied from industry to industry. In minerals & fuels as many as 9% considered it as no deterrent at all or only minor deterrent. In machinery segment, while 25% did not consider it as problem, an equal number found it to be a serious problem, while 50% considered it as a minor problem. In textiles, there was a spread out pattern, with 33% considering it as a major problem and 12% as a very serious problem. Although no clear picture emerges about the impact on export performance, it does seem that poor supply of electric power is a fairly pervasive problem and it cannot but impact on export performance.

c. Transportation

Close to two-thirds (61%) of firms considered problems related to transportation as a minor or moderate, 11% of the respondents considered them as a serious constraint in their business. Only 25% of the respondents did not consider transportation as a bottleneck to their operations.

On roads, 50% reported that availability of road transport system was limited and 35% found available roads to be of poor quality. On the responses to quality of railways, 15% thought these to be of limited availability, 47% of poor quality and 21% as poorly managed. Most of the firms have highlighted the importance of seaports, out of which 84% are from gems and Jewellery. On airports 24% find them of limited availability, 38% of poor quality and 23% as poorly managed.

d. Cost of Transportation

A total of 31% of responding firms stated that they spent up to 5% of their sales in transporting their exports to ports. Of these, 2% spent between 6 to 10% and another 2% over 10% of their sales. 95% of the firms in the gems & jewellery, 33% in plastic, 48% in leather, 43% in chemicals segment spent up to 5% of sales to transport their wares to ports for exports. Other responding firms spending up to 5% were between 16% in minerals & fuels and 20% in textile & apparels. The only significant proportion paying over 10% of sales in transporting export consignment to ports were 17% of plastics firms. Due to problems with domestic shipments, 89% firms suffered losses in production of up to 10% and 1% suffering over 50% losses.

e. Access to finance

Limited access to financial resources is not considered a deterrent by 31% of the respondents. 12% considered it as a major obstacle and more than half (57%) considered it as a minor or moderate obstacle. In pharmaceuticals 80% considered it as a minor obstacle, while 20% did not consider it as one. Access to finance was considered to be a major obstacle by 11% in minerals & fuels of which 1% considered to be serious, 19% in gems & Jewellery of which 5% faced serious access problem, 21% in chemicals of which 7% found it to be a serious obstacle and 6% in textile of which 1% found to be serious.

f. Land availability

Nearly two-thirds of the firms (65%) found non-availability of land as a deterrent to their performance. The proportion of responding firms was somewhat higher in minerals and fuels,

machinery, pharmaceuticals, textiles and plastics. On the other hand, it was lower in case of metals and chemicals.

2.3. ii. Intensity of Competition

A little less than three-quarters 73 % of the respondents considered their business as very intensely or intensely competitive and 25% consider it as normal. 2% had no competition at all. 94% of Gems & Jewellery, 62% of leather and 56% of metals experienced intense competition. There does not appear to be any significant association between export intensity and intensity of competition.

2.3 .iii. Tariff Barriers on Exports

Nearly two-thirds (64%) faced and paid up to 15% tariff rate on their exports. Of the rest 23% of the firms faced a 16 to 25% rate, whereas only 2% firms paid a rate of over 50%. Another 11% of firms faced rates of 26 to 50% tariff on their exports. Of those facing up to a 15% tariff, firms realizing 26 to 50% export intensity had a major share of firms across all industry segments.

2.3. iv. Impact of Appreciation of Indian Rupee

The appreciation of the value of Indian rupee against US dollar during 2005-06 and 2006-07 had substantially affected exports. For about 76% of the firms, it led to a decline in exports of up to 10% in 2005-06, compared to other 24% of the firms which experienced a decline of over 10% during the year. The impact of the appreciating rupee was more severely felt in 2006-07 when exports declined by over 10% for about 57% of the surveyed firms, compared to only 24% in 2005-06.

It appears that firms with lower export intensity are more prone to adverse impact of the appreciation.

2.4 Material Inputs

2.4.i. Supplies from domestic sources

A large share (44%) of the surveyed firms bought a substantial part (slightly over 90%) of their material inputs from domestic sources. Nearly 39% obtained 70% to 90% of their material inputs from the domestic market.

2.4.ii. Supply of inputs through direct imports

More than half (53%) of the responding firms obtained their material inputs of across different ranges by direct imports. While 27% firms imported up to 10% of their requirements, 21% imported between 11% and 30%. Only small proportion imported upward of 30%.

2.5. Non-permanent workforce

Nearly three-fourths of the responding firms (72%) apparently did not employ non-permanent workers. While 41% in minerals and fuels and 33% in leather were major employers of non-permanent workers, others ranged between 17% in plastics and 29% each in metals and

gems and Jewellery. Metals had the maximum 21% of firms employing non-permanent workers, while the least 13% firms were from the machinery segment.

3. Econometric Analyses of Survey Data

3.1 Methodology

Our descriptive analysis looked into the impact or lack thereof of each of various factors individually on export intensities of firms. While the analysis was useful in identifying the significance of each factor on export shares, it did not address the possibility that particular combinations of more than one factor could be significant even if each factor of the combination taken by itself individually was not. For analyzing such possibilities our descriptive analysis was complemented by a simple econometric analysis. The survey used a very long and elaborate and comprehensive questionnaire. It highlighted many potential determinants of such as the size, age, legal status, ownership pattern, internal costs, export costs, tariff, import duty, government subsidy, availability and quality of infrastructure etc. These were grouped into different categories, such as, firms' own characteristics including its physical and human infrastructure, internal, external and institutional barriers, incentives it faced and others. A large number of the questions required only categorical responses such as for example, whether a barrier was not important, moderately important or very important. Hence in the regression analyses, separate dummies have been used for the categorical responses of each firm in order to assess the impact on export performance of the determinant represented by the response, for example, a barrier.

The number of individual explanatory variables is large (as many as sixteen in Physical Infrastructure, 9 in Internal Barriers to a minimum of eight in Human Infrastructure) in relation to the number of observations. With 400 firms in the sample and taking non-responses to some questions into account there were a maximum of 400 observations on Physical Infrastructure and a minimum of 62 in Internal Barriers in the data. Observations with data on all potential explanatory variables that could be included in a single regression were fewer than the number of variables. In this situation one can set the coefficients of a subset (not exceeding number observations) arbitrarily, estimate the other coefficients and obtain an exactly fitting regression that explains all the variation in the dependent variable in the observations! To deal with this problem we resorted to Principal Component Analysis (PCA). PCA exploits the fact that any number of possibly correlated variables can be replaced by an equal number of their linear combinations that are orthogonal (uncorrelated) to each other. However a few of the principal components often account for a large share of the variation (the generalized variance) in the data on explanatory variables. Thus one can replace the large number of possibly highly correlated explanatory variables in a regression by a far fewer(less than the number of observations) uncorrelated principal components.

PCA is also closely related to factor analysis in which the dependent variable is presumed to be determined by a few orthogonal factors or almost so. Each factor in theory represents an independent aspect of the determinants of explanatory variable. It can be shown that if the dependent variable has a factor structure, the components in the PCA can be used to identify the underlying factors.

After estimating the components in the PCA we ran a Tobit regression of export shares (to allow for the fact that export shares cannot be negative and the data therefore contain a

significant number of observations bunched at zero export shares) on the values of the first few components that accounted for at least 50% of the generalized variance in the complete set of explanatory variables. A linear, rather than Tobit regression of a non-negative dependent variable which is subject to bunching at zero is mis-specified and estimating it by ordinary least squares (OLS) would generate coefficient estimates subject to mis-specification biases and inconsistent. Tobit models address the bunching of a non-negative dependent variables at zero in the data. On the other hand the reported zeros in the data could be due to measurement errors rather than true non-participation in the activity, in which case an OLS regression is not mis-specified. Hence we have estimated Tobit as well as linear models. Since the observations with zero observed export shares which are affected by the switch from Tobit to linear regressions were only nineteen, it is possible, though not certain that the specification bias in OLS estimates may not be large and are informative. Most of the qualitative conclusions we drew are similar for the two estimation methods, although as would be expected there are some differences in the magnitudes and statistical significance of the estimates.

The statistical significance of the regression coefficient of each principal component indicates its statistical relevance in explaining export performance. For interpreting the significance of components in economic terms, it is useful if we assume that export share has a factor structure. Then each component can be associated with some factor, that can be identified as a factor representing some identifiable subset of economic determinants of export share, such as infrastructural constraints, incentives and so on. For the purpose of identification we begin the matrix of coefficients of the original set of explanatory variables in each component, viewed as factor loadings. It turns out that it is convenient to use a rotated component matrix rather than the original matrix itself, as the rotation maintains the cumulative percentage of variation explained by the estimated components, while spreading the variation more evenly over the components. The matrix of factor loadings in fact represents the matrix of correlations of the explanatory variables with the components. This enables us to identify each component with the set of variables (correlations) that exceed some threshold significantly in a statistical sense.

3.2. Factors Representing Physical, Human and Financial Infrastructures

One of our objectives is to understand the role and impact of infrastructural constraints on export intensities, based on perceptions of the surveyed firms on the importance and severity of physical, financial and human infrastructure. Proxies for physical infrastructure include (i) inter-state roads; (ii) bridges; (iii) national roads; (iv) railways; (v) seaports; (vi) airports; (vii) electricity supply; (viii) telephone systems and (ix) water supply. For financial infrastructure the proxies include (i) rate of interest (ii) value of the collateral as percentage of the loan. For human infrastructure the proxies include (i) man hour per week (ii) number of skilled workers (iii) education of the manger (iv) education and training of the workers (v) manager's experience in domestic and foreign firms. The responses on severity have been coded on a 0-4 scale and a separate dummy has been used for each code.

The PCA in Table 19 distinguishes four components (factors) for a subset of physical infrastructure that together explain 54% of the variance. Table 20 shows their rotated factor loadings.

The significance of each of the individual variable (i.e. its loading) in a component or factor was measured by setting alternative thresholds (0.25 and 0.5) for the correlation of the

variable and the component and statistically testing whether actual correlation exceed the threshold (Table 20). The first component was identified with importance of physical infrastructure because the correlation of inter-state roads, bridges, electricity, water, telephone and internet passed the threshold tests. The factor loadings for access to land as a minor to moderate obstacle passed the threshold in the second component. Telecommunication obstacle passed the threshold test in third component and obstacles related to transportation, railways, seaport and airport in the fourth component.

Once we identified the components representing the infrastructural constraints and their importance, we ran a Tobit and OLS regression of export shares on the four components (Table 21).

The apparent low pseudo R^2, meaning little explanatory power of the regression and lack of statistical significance of components (except component 1 in OLS) in explaining export shares led us to do a PCA on another subset of nine physical and financial infrastructure variables. Tables 22 and 23 respectively present three of their components that together explained 52% of the variance and their rotated factor loadings.

Factor loadings in Table 23 suggest that electricity supply as a major or very serious obstacle, transportation and access to land as no obstacles pass the threshold tests in component 1. However the transportation as a major to very serious obstacle and access to land major to very serious obstacle pass the threshold test in component 2 and the value of collateral as percentage of loan pass the threshold test in component 3. With the correlations that pass the thresholds being positive it is natural to identify component 1 as representing electricity constraints, component 2 with transportation and land constraints and component 3 with financial constraints. In the Tobit and OLS regressions on export performance (Table 24) show that the third component was statistically significant and negative. This confirms what we found in our descriptive analysis that, inter-state roads, bridges, telecommunication, water and internet were important or very important for the operation of many firms and transportation was found to be major to very serious obstacle. In the descriptive analysis for a majority of firms (nearly two-thirds), road-based transportation is the most important mode of transport employed for shipment of goods within India. However in the Tobit factor 2 has a positive and significant coefficient surprisingly showing that transportation and access to land also as major to severe obstacle are good for export performance.

Next we considered another subset of six human and two financial infrastructure variables and did a PCA on them. The variance decomposition and rotated factor loadings are presented respectively in Tables 25 and 26.

The factor loadings (Table 26) suggest that manager's experience in foreign firms, annual rate of interest, and man hours per week pass the threshold test in the first component, while other aspects of the manager's education pass the threshold test in the second and third components. Except for the higher interest rate on loans viewed as increasing cost of finance, the other two could be viewed as contributing positively to the finance output. Both in the Tobit and OLS regression (Table 27) the first component in having a positive and significant coefficient is comforting, though the positive coefficient is not significant.

3.3. Factors Representing Institutional Constraints

There are several external and environmental deterrents to the operations and performance to business enterprises, more particularly in developing countries. In the globally competitive environment in which businesses have to operate there are several disparities that exist between developing and industrial economies in this respect. Although the Indian economic reforms have eliminated many hurdles, some bureaucratic ones still persist. We sought responses of firms on their attitudes relating the following variables: (i) Trade unionism (ii) Regulatory policy (iii) Tax administration (iv) Customs regulation (v) Labour regulation (vi) Macroeconomic policies (inflation, exchange rate) (vii) Corruption (viii) Anti-competitive practices (ix) conflict resolution (x) political stability and (xi)environmental regulations. In our PCA of the share of the variance explained by the first three components and their rotated factor loadings are given in Tables 28 and 29 respectively. The first three factors explain 51% of the total variation in factor analysis. The factor loadings show (Table 29) that tax rate, tax administration, custom trade & regulation and labour regulation passed the threshold test in the first factor; conflict resolution, political stability, corruption, anti-competitive practices and macroeconomic policy statistically passed the threshold tests in the second factor. Trade unionism was the only variable that passed the threshold test in the third factor.

The Tobit and OLS regression analyses (Table 30) show that the second and third factors representing economic policies, corruption and trade unionism viewed by firms as adverse to them have negative and significant coefficients to the export performance.

3.3. Identification of Internal Barriers Representing Costs

Internal barriers were expected to be most critical to exporting. Some of the internal barriers identified include costs related to export such as (i) cost of cargo clearance at ports, (ii) cost of transportation of export consignment to port, (iii) insurance costs, (iv) warehousing costs and other domestic barriers like (v) cost of purchasing material inputs, (vi) expenses on machinery, (vii) expenses on building, (viii) expenses on land, (ix) rate of interest, (x) intensity of competition, (xi) collateral as percentage of loans etc.

The principal component analysis for internal barriers (Table 31) shows that the first three components explain all the variance. Rotated factor loadings (Table 32) show that in the first component energy cost on power & fuel, cost of machinery and buildings, annual rate of interest and value of the collateral as percentage of loans pass the threshold test. It explains 45% of the variance. In the second variables such as transport cost, cost of material input and corporate taxes along with annual rate of interest pass the threshold tests. In the third component, cost of insurance, annual rate of interest and value of the collateral as percentage of loan pass the threshold tests.

Unfortunately in the Tobit regression none of the three components was statistically significant. Under these circumstances we ran a multiple regression, though it is inappropriate since it does take into account the constraint that export shares can never be negative. The multiple regression results (Table 33) shows that the negative and significant coefficients for second and third factor indicate they are significantly hurting export performance. The value of adjusted R^2 is 0.99 which is extremely high. Hence it can be inferred that internal costs of exporting adversely affect export intensity.

3.4. Identification of Factors Representing Internal Barriers and Incentives

Tables 34 and 35 report the variance decomposition and rotated factor loadings of the first three components in our PCA combining incentives with internal barriers. Our reason for doing a PCA on this combination was to let loadings of some of the components reflect the relative roles of incentives and costs as export performance. Incentives comprise of (i) export subsidy and (ii) export promotion schemes of the government. Factor loadings (Table 35) show that many cost variables pass the threshold tests in one or the other of the three components, while export subsidy and export promotion schemes have negative loadings, they do not pass the threshold test.

In the Tobit and OLS regression analysis (Table 36) only the first and second factors contribute significantly in hurting export performance. Thus transport costs, insurance costs, purchase of material inputs and corporate tax are once again adversely influencing export intensity however, incentives like export promotion schemes do not seem to have a favourable impact on export intensity.

3.5. Identification of Factors Representing a Combination of Barriers (Internal and External) and Incentives

Next we included external barriers such as (i) tariff rate, (ii) unofficial payment, (iii) impact of rupee appreciation and (iv) intensity of competition along with internal barriers and incentives. The first three components (Table 37) explained 81% of the variance had Eigen value higher than 1. Table 38 on factor loadings shows that transport costs, cost of purchase of material inputs, tax rates and the tariff rates pass the threshold tests in factor 1; export clearance costs, energy costs and unofficial payment passed the threshold tests in factor 2 and warehousing costs and policy subsidy passed the threshold tests in factor 3.

Both the Tobit and OLS regression (Table 39) shows that factor 1 had significant negative effect on export share of the firms, while factor 3 had significant positive effect. Thus besides internal costs, tariff and intensity of competition in foreign market are adversely impacting export performance. Government incentives like policy subsidy which the firms are availing correlated with factor 3, and in the regressions are positively seems to have outweighed the negative effects of warehousing costs thus leading to a significant positive coefficient.

3.6. Factors Representing Firms' Own Characteristics

We did a PCA on some of the firms' attributes: (i) number of employees, (ii) number of units of firms, (iii) number of factory outlets, (iv) expenditure on R&D (v) partnership (vi) private (v) public (vi) foreign (vii) age of the firm (viii) exporting years of the firms. We used sector dummies to indicate the main activity of the firms (viz. leather, chemicals, minerals & fuels, gems & Jewellery, cotton textile and apparels, machinery etc.). Firm's size was measured by total numbers of employees, and its ownership by percentage of establishments owned by private, public and foreign investors. The first three components in PCA explain almost 50% of the variance (Table 40) Table 41 lists the rotated factor loadings. It shows that foreign share of ownership, age, number of outlets, exporting years and dummy for minerals and fuels pass the threshold tests in factor 1. The number of skilled workers, number of employees, age of the exporting firms, R&D expenditure and dummy for cotton textile sector pass the threshold test in

factor 2 and partnership, number of units of establishments and gems & Jewellery have passed the threshold test in factor 3.

Tobit and OLS regression results (Table 42) show that second (a potentially favourable) to and the third (potentially unfavourable from efficiency considerations) factor had significant positive and negative effects respectively on export share. We can infer from this that older firms and those having more outlets in the country have an advantage in exporting. Moreover longer years of exporting experience, more skilled labours, more R&D intensive and a bigger in size and firms that are partnerships have significant advantage in exporting. We also found that sectors which are relatively labour intensive like Gems & Jewellery and cotton textile are showing higher propensity to exports.

The last result is consistent with the endowment driven traditional trade theory, that is, relatively a labour abundant country like India has comparative advantage in labour intensive activities. Foreign ownership passed the threshold in the first factor (Table23) but it was not significant in the regression.

3.7 Regression Based on All Components Combined

In all we used twenty four principal components in our eight regressions. Finally we tried to run a single regression with all twenty four of them. But the observations with data on all explanatory variables in a single regression were fewer than the number of components. We found that there were 400 observations on only 3 components, 166 observation on 6 components, 72 observations on 9 components and 35 observations on 12 components. The best we could do was to run a regression with 35 observations on the largest number of twelve components (Table 43). Also there was no multicollinearity among the twelve components. The components were identified with physical, financial and human infrastructure the institutional factors. The regression results are similar as found in the earlier analysis for different categories. The first component is significant in the Tobit model which was identified with importance of physical infrastructure like inter-state roads, bridges, electricity, water, telephone and internet. The second component which was identified with obstacles related to transportation, railways, seaport and airport was negative both in Tobit and OLS models showing an adverse impact on the export performance. The third component identified as value of collateral as percentage of loan is negative and significantly hurt the export performances. The seventh component suggests that manager's experience in foreign firms is positively related to export performance. Institutional factors like conflict resolution, political stability, corruption, anti-competitive practices and macroeconomic policy which were identified in the eleventh component acts as deterrent to export performance.

4. Summary and Conclusions

Our purpose in undertaking the survey was to understand the business climate in India and how it affects export performance of firms. The survey has revealed a comprehensive picture of the environment in which firms are operating in India, both strengths and weaknesses. Several additional information, which were missing in the secondary data analysis (Srinivasan and Archana, 2009, 2010), have been drawn from the field survey which has helped to enrich our study. If we compare the inputs of two studies, the variables which were used for explaining inter-firm differences in the secondary analysis using CMIE, CII data, were not so extensive. The

survey, on the other hand, supplemented with a wide spectrum of variables to capture domestic as well as external barriers and incentives to trade. Some of these are internal costs of exporting, infrastructural bottlenecks, tariff rate, import duty, financial problems, intensity of competition, corruption, domestic regulations, role of government, labour regulation, skill and education of the labour force, political instability, government subsidy and macroeconomic policy, etc.

The primary analysis provides deeper insight by exploring the impact of firm-specific attributes as well as other aspects of the economic environment of Indian firms through principal component (factor) analysis and pooled regressions. Some of the factors identified are as follows:

Infrastructure

Physical infrastructure such as inter-state roads, bridges, telecommunication, water and internet was found to be statistically significant in explaining export performance. In the descriptive analysis also these variables were important or very important for the operation of many firms and some of them were found to be minor to moderate obstacle. Manager's experience in foreign firms and annual rate of interest were significant amongst human capital infrastructure.

Institutions

The role of government and its regulatory policies and perceptions of firms about them contributed to the institutional factor. Some of the institutional elements such as conflict resolution, political stability, corruption, anti-competitive practices, macroeconomic policy (like inflation and forex rate) and trade unionism were found to be significantly affecting export performance.

Internal and External Barriers and incentives

Domestic and external barriers contributed to the factor of internal and external costs to export. Some of the internal costs identified are cost of cargo clearance at ports, cost of transportation of export consignment to port, insurance costs, warehousing costs, cost of purchasing material inputs, expenses on machinery, expenses on building and land, rent on building and land, rate of interest, collateral as percentage of loans, etc., which are adversely influencing export performance. Among the external barriers, tariff rate, unofficial payment and intensity of competition are adversely impacting export intensity. Government incentives like policy subsidy expected to be favourable to the export performance do not appear to be so in our analysis in a consistent manner.

Characteristics

Firms' characteristics were found to be important issue. Firm size, firm exporting age, age of firm, R&D intensity and the structure of ownership are positively related to the propensity to export. Other firm characteristics such as import intensity and profitability were also found to be significant in explaining the export intensity. As has been established by numerous studies the Total Factor Productivity (TFP) is of crucial importance for its competitiveness in export markets. Our study has identified several firm characteristics and constraints on its economic environment that could affect its TFP.

To sum up infrastructural constraints and internal costs in India are seriously affecting the Indian firms to compete in export markets. Institutional bottlenecks like uncertainty of regulatory policy, political stability, customs and trade regulations, macroeconomic policy also need attention.

Physical Infrastructure

Table 19. Total Variance Explained By first four Components

Component	*Initial Eigen values*			*Sums of Squared Loadings of Rotated Components*		
	Total	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*
1	3.436	21.474	21.474	2.699	16.867	16.867
2	2.220	13.875	35.349	2.050	12.811	29.678
3	1.663	10.394	45.742	1.971	12.319	41.997
4	1.349	8.433	54.175	1.948	12.177	54.175

Table 20. Rotated Factor Loadings (Tobit and OLS)*

	Component			
	1	*2*	*3*	*4*
Telecommunications- No Obstacle	-.069	-0.053	-0.952	-0.138
Telecomm-Minor to Moderate Obstacle	.083	0.049	0.949 ***(Ho: 0.25; Ha:>0.25) ***(Ho: 0.5; Ha:>0.5)	-0.035
Electricity Supply- Minor to Moderate Obstacle	.109	0.175	0.048	0.469 ***(Ho: 0.25; Ha:>0.25)
Transportation- No Obstacle	-0.381	-0.391	-0.268	0.347 ***(Ho: 0.25; Ha:>0.25)
Transportation-Minor to Moderate Obstacle	0.409 ***(Ho: 0.25; Ha:>0.25)	0.352 ***(Ho: 0.25; Ha:>0.25)	0.209	-0.543
Access to Land- No Obstacle	-.045	-0.928	-0.053	-0.050
Access to Land- Minor to Moderate Obstacle	.070	0.887 ***(Ho: 0.25; Ha:>0.25) ***(Ho: 0.5; Ha:>0.5)	0.008	-0.051
Inter-State Roads – Important	0.628 ***(Ho: 0.25; Ha:>0.25) ***(Ho: 0.5; Ha:>0.5)	-0.148	0.061	-0.132
Bridges-Important	0.584 ***(Ho: 0.25; Ha:>0.25) ***(Ho: 0.5; Ha:>0.5)	0.153	0.030	-0.015

Railways- Important	0.185	0.048	0.050	0.528 ***(Ho: 0.25; Ha:>0.25) ***(Ho: 0.5; Ha:>0.5)
Seaport-Important	0.265	-0.021	0.156	0.478 ***(Ho: 0.25; Ha:>0.25)
Airport-Important	0.181	0.123	0.029	0.671 ***(Ho: 0.25; Ha:>0.25) ***(Ho: 0.5; Ha:>0.5)
Electricity-Important	0.567 ***(Ho: 0.25; Ha:>0.25) ***(Ho: 0.5; Ha:>0.5)	0.077	0.040	0.234
Water-Important	0.584 ***(Ho: 0.25; Ha:>0.25) ***(Ho: 0.5; Ha:>0.5)	0.092	0.086	0.069
Telephone-Important	0.583 ***(Ho: 0.25; Ha:>0.25) ***(Ho: 0.5; Ha:>0.5)	0.098	0.046	0.442 ***(Ho: 0.25; Ha:>0.25)
Internet-Important	0.694 ***(Ho: 0.25; Ha:>0.25) ***(Ho: 0.5; Ha:>0.5)	0.048	0.000	0.243

Table 21. Regression

Export share	*Tobit*	*OLS*
Component 1	-0.047 (-0.04)	1.26e+13**(2.20)
Component 2	0.001 (0.00)	4.48e+12(0.78)
Component 3	2.239 (2.02)	5.49e+12(0.96)
Component 4	1.300 (1.17)	7.57e+12(1.32)
_cons	31.11 (29.09)	2.96e+14***(51.58)
	Pseudo R^2 = 0.0016	R^2 = 0.211

*** Significant at 1%; ** Significant at 5%, * Significant at 10%
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
***No. of Observations - 400 (Tobit) and 381(OLS)**

Physical and Financial Infrastructure

Table 22. Total Variance Explained by first 3 components (Tobit Model and OLS)

Component	*Initial Eigen values*			*Sums of Squared Loadings of Rotated Components*		
	Total	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*
1	1.753	19.480	19.480	1.646	18.285	18.285
2	1.606	17.850	37.330	1.612	17.913	36.197
3	1.308	14.531	51.862	1.410	15.664	51.862

Extraction Method: Principal Component Analysis.

Table 23. Rotated factor loadings (Tobit and OLS) #

	Component		
	1	*2*	*3*
loss domestic shipment break	-.063	.275	-.571
international shipment break	-.007	.007	-.586
value collateral as % of loan	.106	.284	.622 *** (Ho: 0.25; Ha: $\rho > 0.25$) *** (Ho: 0.5; Ha: $\rho > 0.5$)
Electricity Supply-No Obstacle	-.643	-.103	.398 ***(Ho: $\rho = 0.25$; Ha: $\rho >$ 0.25)
Electricity Supply-Major to Very Severe Obstacle	.805 ***(Ho: $\rho = 0.25$; Ha: $\rho>0.25$) ***(Ho: $\rho = 0.5$; Ha: $\rho > 0.5$)	.295	.167
Transportation- No Obstacle	.561 ***(Ho: $\rho = 0.25$; Ha: $\rho>0.25$) **(Ho: $\rho = 0.5$; Ha: $\rho > 0.5$)	-.442	.095
Transportation-Major to Very Severe-Obstacle	-.041	.710 ***(Ho:$\rho = 0.25$;Ha:$\rho>0.25$) ***(Ho: $\rho = 0.5$; Ha:$\rho > 0.5$)	.194
Access to Land –No Obstacle	.494 ***(Ho:$\rho = 0.25$;Ha:$\rho>0.25$)	-.247	.271
Access To Land-Major to Very Severe Obstacle	.084	.773 ***(Ho:$\rho = 0.25$;Ha:$\rho>0.25$) ***(Ho: $\rho = 0.5$; Ha:$\rho > 0.5$)	-.220

Table 24. Results of Regression Analysis

Export Share	*Tobit*	*OLS*
Component 1	1.535 (1.14))	1.13(0.85)
Component 2	3.527***(2.63)	-4.097***(-3.08)
Component 3	-3.89*** (-2.9)	-4.135***(-3.11)
Cons	28.471***(21.28)	28.773***(21.68)
	Pseudo R^2 = 0.0115	R^2 = 0.114

*** Significant at 1%; ** Significant at 5%, * Significant at 10%
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
#No. of Observations – 245 (Tobit), 236 (OLS)

Human and Financial Infrastructure

Table 25. Total Variance Explained by first 3 components

(Tobit and OLS)

Component	*Initial Eigen values*			*Sums of Squared Loadings of Rotated Components*		
	Total	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*
1	1.888	23.602	23.602	1.715	21.434	21.434
2	1.541	19.267	42.869	1.561	19.515	40.949
3	1.110	13.877	56.746	1.264	15.797	56.746

Extraction Method: Principal Component Analysis.

Table 26. Rotated factor loadings (Tobit and OLS)+

	Component		
	1	*2*	*3*
Education of Manager- Post Graduate	-.014	-.412	.693 ***(Ho: ρ = 0.25; Ha: ρ > 0.25)
manager experience in foreign firm	.672 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.331	.052
value collateral as % of loan	-.694	.251	.015
annual rate of interest	.736 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.105	.013
Man Hr/week	.488 ***(Ho: ρ = 0.25; Ha: ρ > 0.25)	.285	.540
unv degree	-.027	.774 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.145

Diploma	-.023	.240	.684 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)
Vocational	.037	-.686	.020

Table 27. Results of Regression Analysis

Export Share	*Tobit*	*OLS*
Component 1	4.729**(2.21)	4.630**(2.28)
Component 2	-2.902(-1.35)	-2.702(0.187)
Component 3	-1.518(-0.71)	-1.704(-0.84)
Cons	27.511***(12.9)	27.712***(13.70)
	Pseudo R^2= 0.0074	R^2 = 0.0686
Dependent Variable: log export share		

*** Significant at 1%; ** Significant at 5%, * Significant at 10%
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
+No of observations – 245 (Tobit) and 236 (OLS)

Institutional Infrastructure

Table 28. Total Variance Explained by first 3 components (Tobit and OLS)

Component	*Initial Eigen values*			*Sums of Squared Loadings of Rotated Components*		
	Total	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*
1	2.882	26.197	26.197	2.296	20.876	20.876
2	1.596	14.506	40.702	2.019	18.356	39.232
3	1.143	10.390	51.092	1.305	11.860	51.092

Extraction Method: Principal Component Analysis.

Table 29. Rotated factor loadings (Tobit and OLS)##

	Component		
	1	2	*3*
%of worker unionised	.089	-.125	.780 ***(Ho:ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)
Regulatory Policy-Minor to Moderate Obstacle	.503 ***(Ho: ρ = 0.25; Ha: ρ > 0.25)	.107	-.457
Tax rates-Minor to Moderate Obstacle	.736 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.008	.138
Tax Admin-Minor to Moderate obstacle	.597 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) **(Ho: ρ = 0.5; Ha: ρ > 0.5)	.213	-.149
Customs trade regulation-Minor to Moderate Obstacle	.699 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.120	-.040
Labor regulations-Minor to Moderate Obstacle	.568 ***(Ho: ρ = 0.25; Ha: ρ > 0.25)	-.063	.249
Macro-Policy –Minor to moderate Obstacle	.158	.643 ***(Ho:ρ = 0.25; Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.283
Corruption -Minor to Moderate Obstacle	-.088	.697 ***(Ho:ρ = 0.25; Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.148
Anti Competitive policy-Minor to Moderate Obstacle	.055	.686 ***(Ho:ρ = 0.25; Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.296
Conflict Resolution-Minor to Moderate Obstacle	.484 ***(Ho:ρ = 0.25; Ha:ρ >0.25)	.527 ***(Ho:ρ = 0.25; Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.113
Political stability-Minor to Moderate-Obstacle	.234	.530 ***(Ho:ρ = 0.25; Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.425 ***(Ho:ρ = 0.25; Ha:ρ >0.25)

Table 30. Results of Regression Analysis

Export Share	*Tobit*	*OLS*
Fact 1	-0.579(-0.34)	-.612(-0.36)
Fact 2	-3.159**(-1.86)	-3.142**(-1.86)
Fact 3	-5.219***(-3.07)	-5.078***(-3.00)
Cons	29.975***	29.96***(17.79)

Dependent Variable: export share
*** Significant at 1%; ** Significant at 5%, * Significant at 10%
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
##No of observations – 130 (Tobit) and 121 (OLS)

Internal Barriers

Table 31. Total Variance Explained by First 3 components

Component	*Initial Eigen values*			*Sums of Squared Loadings of Rotated Components*		
	Total	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*
1	5.028	45.711	45.711	4.447	40.429	40.429
2	4.194	38.128	83.839	4.314	39.222	79.650
3	1.778	16.161	100.000	2.238	20.350	100.000

Extraction Method: Principal Component Analysis.

Table 32. Rotated Factor Loadings (Tobit and OLS)++

insurance cost	-.093	-.146	.985 ***(Ho: ρ = 0.25; Ha: ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)
ware cost	-.131	-.586	-.800
Purchase of material cost	-.039	.999 ***(Ho: ρ = 0.25; Ha: ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.012
energy cost	.998 ***(Ho: ρ = 0.25;Ha: ρ >0.25)	-.054	-.044
Tax	-.281	.960 ***(Ho: ρ = 0.25; Ha: ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.010
Expenditure on machinery	.997 ***(Ho: ρ = 0.25;Ha: ρ>0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.060	-.046
expenditure buildings	.996 ***(Ho: ρ = 0.25; Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.071	-.050
annual interest rate	.675 ***(Ho: ρ = 0.25; Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.530 ***(Ho: ρ = 0.25; Ha: ρ >0.25)	.513 . ***(Ho: ρ = 0.25; Ha: ρ >0.25)
collateral as% loan	.847 ***(Ho:ρ = 0.25; Ha: ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.028	.531 ***(Ho: ρ = 0.25; Ha: ρ >0.25)

Table 33. Results of Multiple Regression Analysis

Export share	*Coeff.*	*Std. Err.*	*T*
Component 1	-1.787	1.767765	-1.01
Component 2	-9.420*	1.767764	-5.33
Component 3	-13.44*	1.767765	-7.6
Cons	20.799**	1.581139	13.16

R^2 = 0.9887; Adj R^2 = 0.9547
*** Significant at 1%; ** Significant at 5%, * Significant at 10%
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
++ No of observations – 62 (Tobit) and 53(OLS)

Internal Barriers and Incentives

Table 34. Total Variance Explained by first 3 components

Component	*Initial Eigen values*			*Rotation Sums of Squared Loadings*		
	Total	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*
1	5.591	46.590	46.590	5.043	42.024	42.024
2	4.404	36.700	83.290	4.855	40.456	82.481
3	1.519	12.660	95.950	1.616	13.469	95.950

Table 35. Rotated factor loadings (Tobit and OLS model)###

	Component		
	1	*2*	*3*
export clear	-.126	.975 ***(Ho: ρ = 0.25; Ha: ρ > 0.25)	-.062
Transportation cost	.902 ***(Ho: ρ = 0.25; Ha: ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.228	.022
insurance cost	-.173	-.280	.943 ***(Ho:ρ = 0.25; Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)
Ware cost	-.418	-.483	-.694
Purchase material cost	.977 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.171	.031
energy cost	-.018	.994 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.018
Tax	.993 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.088	.041
% of worker unionised	.391 **(Ho: ρ = 0.25; Ha: ρ > 0.25)	-.672	.485 **(Ho: ρ = 0.25; Ha: ρ > 0.25)
export subsidy	-.978	.189	-.035

export promotion	-.978	.189	-.035
expenditure machinery	-.028	.997 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.021
expenditure building	-.035	.999 ***(Ho: ρ = 0.25; Ha: ρ > 0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.023

Table 36. Results for regression analysis

Export Share	*Tobit*	*OLS*
Component 1	-9.037*(-2.07)	-1.14e+14*(-3.42)
Component 2	2.029(0.47)	1.53e+13(0.046)
Component 3	-18.462**(-2.84)	-1.15e+14*(-3.44)
Cons	26.443***(6.03)	2.70e+14***(8.87)
		R^2 = 0.937

Dependent Variable: log export share;
*** Significant at 1%; ** Significant at 5%, * Significant at 10%
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
No of observations –62 (Tobit) and 53(OLS)

Internal & External Barriers and Incentives

Table 37. Total Variance Explained by first 3 components

Component	*Initial Eigen values*			*Sums of Squared Loadings of Rotated Components*		
	Total	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*
1	4.931	41.088	41.088	4.835	40.292	40.292
2	2.805	23.376	64.464	2.518	20.985	61.277
3	2.095	17.456	81.920	2.477	20.643	81.920

Extraction Method: Principal Component Analysis.

Table 38. Rotated factor loadings (Tobit and OLS Model)+++

	Component		
	1	*2*	*3*
Export clear	-.047	.878 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5)	-.140
Transportation cost	.840 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5	-.126	.225
insurance cost	-.258	.569 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5)	.606 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5)

ware cost	-.277	-.129	.915 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5)
Purchase material	.942 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5	.148	-.205
energy cost	-.083	.873 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5	-.408
Tax	.976 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5	.041	-.159
Policy subsidy	-.176	-.057	.753 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5
tariff	.968 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5)	-.174	-.055
unofficial payment	.177	-.708	-.150
Very Intense Competition	.565 ***(Ho:ρ = 0.25; Ha:ρ >0.25) *** (Ho: ρ = 0.5; Ha: ρ > 0.5)	-.183	.579 **(Ho:ρ = 0.25; Ha:ρ >0.25) **(Ho: ρ = 0.5; Ha: ρ > 0.5)
Rupee impact % decline	-.905	.193	.203

Table 39. Results of Regression Analysis

Export share	*Tobit*	*OLS*
Component 1	-7.415* (-1.46)	-8.61e+13**(-2.58)
Component 2	4.295(0.85)	3.47e+13(1.04)
Component 3	14.249**(2.14)	7.43e+13*(2.23)
Cons	30.887***(5.63)	2.91e+14***(9.25)
	Pseudo R^2 = 0.124	R^2 = 0.717

Dependent Variable is log export share
*** Significant at 1%; ** Significant at 5%, * Significant at 10%
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
+++ No of observations –62 (Tobit) and 53(OLS)

Firms' Characteristics

Table 40. Total Variance Explained by first 3 components

Component	*Initial Eigen values*			*Sums of Squared Loadings of Rotated Components*		
	Total	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*
1	3.160	21.069	21.069	2.822	18.811	18.811
2	2.596	17.310	38.379	2.738	18.255	37.066
3	1.677	11.181	49.560	1.874	12.494	49.560

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization

Table 41. Rotated Factor Loadings (Tobit and OLS Model)####

	Component		
	1	*2*	*3*
partnership	-.127	-.093	.598 ***(Ho: ρ = 0.25; Ha: ρ >0.25) **(Ho: ρ = 0.5; Ha: ρ > 0.5)
private share	.878 ***(Ho: ρ = 0.25; Ha: ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.071	.073
foreign share	.884 ***(Ho: ρ = 0.25; Ha: ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.057	-.108
No. unit	.216	.093	.530 ***(Ho: ρ = 0.25; Ha: ρ >0.25)
skill worker	-.109	.702 ***(Ho: ρ = 0.25;Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.008
No of employee	-.019	.913 ***(Ho: ρ = 0.25;Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.026
Age	.643 ***(Ho: ρ = 0.25;Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	.551 ***(Ho: ρ = 0.25;Ha:ρ >0.25) *(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.047
factory outlet	.425 ***(Ho: ρ = 0.25;Ha:ρ >0.25)	-.047	.234
exporting years	.578 ***(Ho: ρ = 0.25;Ha:ρ >0.25) **(Ho: ρ = 0.5; Ha: ρ > 0.5)	.501 ***(Ho: ρ = 0.25;Ha:ρ >0.25)	-.184
exp R&D	-.003	.711 ***(Ho: ρ = 0.25;Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)	-.099
Minerals and Fuels	.368 ***(Ho: ρ = 0.25;Ha:ρ >0.25)	-.190	-.032
Gems and Jewelry	-.074	-.159	.815 ***(Ho: ρ = 0.25;Ha:ρ >0.25) ***(Ho: ρ = 0.5; Ha: ρ > 0.5)
Cotton textiles Apparels	-.292	.464 ***(Ho: ρ = 0.25;Ha:ρ >0.25)	-.296
Machinery	.190	-.127	-.436
capacity utilization	.064	-.177	.417 ***(Ho: ρ = 0.25;Ha:ρ >0.25)

Table 42. Results of Regression Analysis

Export Share	*Tobit*	*OLS*
Component1	-2.772 (1.311)	-1.29e+13(-1.18)
Component2	3.951**(1.866)	2.03e+13**(1.85)
Component3	-6.470***(-3.057)	-1.87e+13*(-1.71)
Cons	30.568***(14.508)	2.91e+14***(26.74)
	Pseudo R^2 = 0.017	R^2 = 0.083

Table 43. Results of regression analysis on all the Components taken together

Export Share	*Tobit*	*OLS*
Component1	9.354*(-1.90)	-8.60(-1.49)
Component2	-4.678(-1.33)	-4.076(-0.98)
Component3	-12.098***(-4.71)	-10.833***(-3.50)
Component4	-1.342(-0.34)	-1.046(-0.23)
Component5	2.346(0.43)	0.736*(6.549)
Component6	-5.943*(-1.46)	-7.233(-1.48)
Component7	18.767***(3.46)	12.632(7.886)
Component8	6.546*(3.907)	6.365(1.38)
Component9		-6.766(-1.31)
Component10	-3.745(1.39)	-3.057(-0.96)
Component11	-5.095*(3.47)	-3.294(0.453)
Component12	-0.942(2.380)	-1.418(-0.50)
Constant	30.910***(11.93)	32.741***(9.98)
No. of obs.	**36**	**35**
	PseudoR^2= 0.092	R^2 = 0.557

*** Significant at 1%; ** Significant at 5%, * Significant at 10%
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization

No of observations –93 (Tobit) and 90(OLS)

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APPENDIX I

Below are some of the concepts which were used inside the text:

Establishment means for purposes of the questionnaire any firm, partnership firm, private limited company, subsidiary of a foreign controlled entity – which has separate and independent accounting processes. If a company owns several production facilities or factories, all are clubbed together in the company.

Listed company means the company quoted on the stock exchange/s.

Business group means commonly controlled establishment. It includes subsidiaries, non-subsidiaries and partnership firms.

Product means goods which can be identified distinctly. For example, a company in textile business might be producing three or more products, such as yarn, fabrics, garments, towels, carpets. Each of these products is to be treated as separate product – not separate firms or unit. But different sizes or brands are not to be treated as separate products. If an automobile company produces passenger cars and commercial vehicles of different models, products will be only passenger cars and commercial vehicles – not models or sizes.

Impact' on exports of appreciation of the rupee means the annual variations in exports due to appreciation of rupee, against the dollar since the appreciation has not taken place in Euros or DM and is restricted to the US dollar.

Unofficial payment refers under the table/unaccounted payment or gifts to gain any commercial favour or benefit. It could be in any form and directed to gain a specific benefit. It may be demanded or offered proactively.

Export subsidies cover the direct financial assistance or reduction in duties by the government. These include duty drawbacks.

Export promotion subsidy is a government policy to encourage export of goods and discourage sale of goods on the domestic market through low-cost loans or tax relief for exporters, or government financed international advertising or R&D. Export subsidies are for export promotion under export promotion schemes. Thus export subsidy, export promotion subsidy scheme and policy subsidy are used interchangeably under different contexts.

Tariff rates refer to both import and export duties and surcharges including countervailing duties.

Export related costs are costs over and above cost of production or marketing costs.

Material inputs cover all procured materials for production of outputs and include semi-finished or intermediate products and components purchased from other entities.

Collateral refers to the assets (tangible or intangible) pledged by the establishment to the lender in support of its obligations to repay the loan. Besides fixed assets, it could be in the form of shares and securities and recoverable debts.

Permanent workers means all types of workers on regular pay roll of the company, entitled to all corporate benefits, including terminal benefits.

Non-permanent workers refers to all types of casual/daily wage workers who are not entitled to regular employee benefits, especially terminal benefits, like PF, gratuity.

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