Too Small to Export: Firm Characteristics for Export Market Participation in Manufacturing Sector

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Abstract

This paper attempts to identify factors that facilitate export decision of a firm. Enterprise survey of WB has been used to capture those factors through Probit model. Our results suggest that firm size, improved organizational structure, owning/sharing a generator and formal training are the most crucial properties of a firm that shape a firm's decision to export. The probability of export is higher for larger firms while small firms tend not to export due to the fact that large firms can enjoy economies of scale, utilize economies of scope, capacity to bear shocks. On average, small firms have 0.36 % less probability to export than a large firm. Continuous supply of electricity is positively related with production, hence, owning/sharing a generator increases the probability of export for any firm. Specifically, if a firm owns/hires a generator from its no generator status, its probability of export increases by .16% than the firms that do not own/hire a generator. Moreover, formal training has positive and significant impact on the probability of export through efficiency and skill augmentation. Firms that give training to their workers have .20% more probability of export than the firms that do not give training to their workers. The marginal effect of improved organizational structure is 0.17% implies structured organizational hierarchy and specialized personnel management assist firms to engage in export through high buyer's satisfaction.

Key Words: Export Determination, Probit Model, Firm Size and Firm Characteristics

JEL Classification: D21, F17, L25.

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1. 0 Introduction

Bangladesh being one of the fastest growing nations of the world has been impressive in recent export performance with a remarkable 231 per cent increase in export earnings from 2005-06 to 2013-14 (Ministry of Finance, 2015). Apart from its heavy reliance on garments sector, its private entrepreneurs already started to invest in diverse manufacturing and non-manufacturing sector. Various sized firms have been growing all over the country namely 42792 firms have registered in 2012 that fall under large, medium, small and micro categories (BBS, 2013), many of these have outward orientation. Some are entirely outward looking and solely operating to cater the needs of foreign market. Others are producing in both local and domestic market. Sometimes they do not supply same quality products in both markets. In terms of size lot of small firms are available in Bangladesh, specifically 55219 small firms were active in 2011 (BSCIC, 2011). In fact, small and medium firms coexist with larger firms in Bangladesh, some of various sized firms may be involved in export.

Export determinants can be region specific, market specific, product specific or capacity specific. Sometime export capacity of firms grow with time. On the other hand, some firms born with export capacity meaning that these firms originated to cater the foreign demand only (Knight & Cavusgil, 2004). Entrepreneur's adroitness, language skill to communicate with foreign buyers and e-commerce exposure boost a firm's intention to internationalization (Rana & Sørensen, 2013). Firms can be various type according to their size. Large firms have different kind of advantage over medium or small firms. On the contrary, small or medium firms have other type of advantages over large firms. Small firms can exploit its comparative advantage derived from its specialization and hence can focus to excel in the production of that good.

Our paper aims to identify the factors that are crucial to determine the participation in export. These factors may be external to the firm or internal to the firm. Cost advantage always offers an edge to those firms that can produce it cheaply. But factor abundance does not poise any country or the firm absolute advantage anymore. Rather countries with similar factor endowment compete with each other to capture the foreign market. Hence, other forms of efficiency, innovative product processing and mechanism, networking, branding have become dominant characteristics of a successful exporter firm. Therefore, unconventional factors along with conventional factors have

become the central of recent literature (Markusen & Venables, 1998; Krugman, 1995; Tybout, 2001). While idea of new trade theory explains a lot of unexplained trade, the rise of these unorthodox factors illustrates a lot of unanticipated export. Specifically, individual taste, imperfect competition, economies of scale, geographical and historical advantages can explain the export difference among countries. Though some of these factors are beyond the coverage of our paper, only the year of experience of the firm and research spending have some relation with dynamic economies of scale and also falls under the jurisdiction of our analysis. However, our research spending is a dichotomous variable explaining whether a firm has research spending or not. These factors used as stimulus for innovation and thereby works as catalyst of participating in export market.

The present study has been organized in the following way: *Section one* captures the background of the study under introduction. *Section two* describes the review of existing literatures. Methodological process and explanation of data are captured in *section three. Section four* covers the results and their interpretation. Finally, *section five* explains concluding remarks and policy recommendations.

2. 0 Literature Review

The factors that determine the success in export of a firm are diverse in nature. These factors depend on the nature of the market where they are operating, type of the product they are producing (manufacturing and non-manufacturing) etc. If small firms concentrate their export to only few countries can improve their sales performance. Because concentrating on large number of markets may weaken managerial, organizational and financial capacity to expand successfully. Concentrating on few markets enable them to reinforce their backward and forward linkage to mobilize resources efficiently (Brouthers, et al., 2009).

Firms' association with various networks, initiative of joint venture and existence of subsidiaries determine export capacity of a firm. Additionally, adapting capacity with new technology, information and education enhance export capability of enterprises (Gumede & Rasmussen, 2002). Three key characteristics i.e. enterprise value, technological strength, and firm size can be used to judge firms strategy of export performance. The strength of a firm's export orientation can be perceive through these three factors that are reflected on their degree of internationalization and

overall performance (Dhanaraj & Beamish, 2003). Moreover, firm size being one of the most used predictor identified by many authors in case of determinants of export performance (Baldauf, et al., 2000: Majocchi, et al., 2005). Smaller firms usually less promising in terms of export than larger firms due to inward looking managerial attitude (Ali & Swiercz, 1991).

Results on firm size and technological innovation as found by many authors in various literatures are not conclusive. Some studies found positive significant relationship among them whiles others did not confirm this relationship. Even some of them found negative relationship among them (Pla-Barber & Alegre, 2007). This apparent contradiction may be due their methodology and the way of measuring these phenomena. While some of them defined technological innovation as percentage of R&D expenditure, others stated it as no. of patents granted or number of new products introduced in their product-line etc. (Audretsch & Acs, 1991).

From technological point of view small firms enjoy robust advantage in terms of products and lower end technology while larger firms enjoy robust advantage in terms of marketing. The association between firm size and competitive advantage is not linear at all. Larger firms tend to be more aggressive and outward looking than smaller sized firms. If we consider only marketing, then larger firms are more efficient and effective (Moen, 1999). Learning through doing, investing in research and development (R&D), industrial manufacturing, innovative marketing, organizational development, efficient resource allocation, applications of effective strategy determine size and productivity of firms. These factors ultimately play critical role in export performance of any firm (Guan & Ma, 2003).

Many authors illuminated on the firms' capability ranges from local image to adaptability with foreign knowledge. These firms need to gather knowledge on foreign market, creating new networks focus on innovation, outward oriented marketing strategy and embalming their own image in both local as well as foreign market (Alexopoulos, et al., 2004). The success of building networks, constructing forward and backward linkage and involvement in innovative activities shape the capability of export for both manufacturing and non-manufacturing firms. Small firms exploit networking and innovation better in case of manufacturing while in non-manufacturing sector large and medium sized firms do the same thing better. Both networking and innovative activities sharpen the competitive edge of firms in case of export (Rogers, 2004).

Some researchers used structural equation model to capture the export variation for dissimilar economies (Dhanaraj & Beamish, 2003). Some researchers tried to run a multiple regression with relevant control variables and inferred on export performance on the basis of that. The issues of measurement error and multiple indicators have been employed to capture the export competitiveness of industries in a single-country exporting study (Bijmolt & Zwart, 1994). Some researchers executed factor analysis with firm characteristics, subjective and objective entrepreneurship characteristics along with international activity and performance to compare the export performance (Mason & Pauluzzo, 2008).

3.0 Data, Variables and Methodology

3.1 Data and Variables

Data from World Bank Enterprise Survey-Bangladesh (Manufacturing Module, 2013) have been employed in this study to discover the factors that are responsible for promoting the successful export of firms operating in Bangladesh. This study employed the method like (Amornkitvikai, et al., 2012) to find out the factors that influence the probability of a firm to be involved in export activities. The World Bank conducts the Enterprise Survey across the all countries to identify the business environment of different countries covering small, medium and large firms. The survey collects the quantitative and qualitative information from the firm managers and owners concerning the business environment and firm productivity. It is a repeated survey of World Bank over time to measure the firm performance (The World Bank, 2013).

The present study used the World Bank Enterprise Survey-Bangladesh (Manufacturing Module, 2013) to find out its desired objective. The survey has been conducted on 1442 firms covering small, mediums and large firms operating in Bangladesh. To satisfy the desired objective, the study focused only those firms who identified themselves as exporter or non-exporters. After excluding the firms that couldn't identify themselves either exporter or non-exporter, the study obtained 1179 firms as its sample size to explore the objective.

3.2 Description of the variables

Export status variable has been employed as the dependent variable defined as Export status=1 if an enterprise is currently exporting or is considering to enter into export market in the next twelve

months and Export status=0 for otherwise. The mean of export status variable is 0.327 implying that about 33 per cent of sample firms are involved in export activities. To determine the factors that influence the probability of export activities, firm size plays a crucial role. Firms are identified as two categories as small and medium enterprises and large companies based on firm size. Firm size identified as SME, an explanatory variable, has received 1 when a particular enterprise is small or medium enterprise and it received 0 when a particular enterprise is large company[3]. The mean of SME variable is 0.739 implying that about 74 per cent of the total firms surveyed are small and medium enterprise. Firm's experience implies years of experience of a firm from the beginning of the establishment of that particular enterprise. The data of 1437 firms reveal that the average years of experience of a particular enterprise from the beginning of its establishment is almost 21 years[4]. The number of skilled full time employees of a firm, on average is about 169 employees. The average years of schooling of a worker is 6.63 years. On the other hand, the average years of schooling of an average female worker is 5.94 years which is lower than average of a particular worker supporting the national level of data. The other independent variables are female firm owner, permanent full time employees, having own or share generator, location of firm based on export processing zone, firm spending on research, providing opportunity of formal training for employees, introducing improved marketing method, introducing improved organizational structure and loan status. The detailed summery has been shown in table 1.

Table 1: Summary Statistics

Variables	Description of variables	Mean	Standard Deviation	Number of observations
Export Status	Export status=1 if an enterprise is currently exporting or is considering to enter into export market in the next twelve months and Export status=0 for otherwise	0.327	0.469	1179
SME	SME=1 if an enterprise is small or medium and SME=0 for otherwise	0.739	0.440	1442
Female Firm owner	Firm owner=1 if the firm owner is female and Firm owner =0 for otherwise	0.184	0.388	1441

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[3] A firm is defined as small and medium if it has number of employees less than 100. Conversely, a firm is define as large if it has at least 100 employees.

[4] Average years of experience of a small or medium firm is 20 years while large has experience 22 years on average.

Permanent Full-time employees	Total number of permanent, full time employees	218.201	652.353	1442
Having own/share generator	Having generator=1 if an enterprise has a owned or shared generator and Having generator=0 for otherwise	0.601	0.490	1442
Location of firm based on epz	Location of firm=1 if a firm is located in export processing zone or in industrial park and Location of firm=0 for otherwise	0.135	0.342	1440
Firm spending on research	Research Spend=1 if an enterprise does spend in research and Research Spend=0 for otherwise	0.154	0.361	1435
Firm's experience from the establishment	Years of experience from the beginning of the establishment	20.978	13.693	1437
Worker's years of education	Years of education achieved by an employee (on average)	6.633	2.313	1164
Female's year of education	Years of education achieved by female (on average)	5.941	2.492	623
Opportunity for formal training	Formal training=1 if an enterprise offers a formal training to its employees and Formal training=0 for otherwise	0.291	0.455	1442
Skilled full-time employees	Total number of skilled full time employees	169.092	550.339	1179
Introducing improved marketing method	Improved marketing method=1 if an enterprise does develop an improved version of its marketing method and Improved marketing method=0 for otherwise	0.333	0.471	1437
Taking loan	Taking loan=1 if an enterprise took loan from the financial institution or relatives and Taking loan=0 for otherwise	0.439	0.496	1416
Introducing improved organizational structure	Improved organizational structure=1 if an enterprise does develop an improved organizational structure and Improved organizational structure=o for otherwise	0.354	0.478	1435

3.0 Methodology

Probit model has been employed to find that factors that are most relevant to explain the success of the export of firms in Bangladesh. To explain the factors that influence the probability of export, probit model has been used due to some limitations of Linear Probability Model (LPM) and Logit Model. To explain the basic idea, let's assume the basic regression model

$$Y = \alpha + \beta X + \varepsilon$$

Where the dichotomous dependent variable, Y, indicates the status of export. The explained variable is the probability of changing the status from 'does not export' to exports (from 0 when does not export to 1 when exports). The vector of explanatory variables, X, indicate the factors that influence the probability of export of a firm. The conditional probability $E(Y|X)$ is expected to lie between 0 and 1. Unfortunately one cannot assure to fulfil this restriction in cases of applied problem of LPM. Non-normality of the disturbance problem, lower value of R^2 are considered the real problems of linear probability model. The another problem is violation of the assumption of homoscedastic variance of the disturbance term. It is highly difficult to acquire the accurate causality due to limitations of LPM. To avoid these difficulties, Cumulative Distribution Function (CDF) is used. One of the form of cumulative functions is logit model. The logistic distribution function (Gujarati, 2009) can be represented as

$$P_i = E(Y = 1|X) = \frac{1}{1 + e^{-(\alpha + \beta X)}}$$

However in case of standard normal logistic random variable, the standard normal cumulative distribution function, the probit model, is used (Wooldridge, 2015) and most of the studies generally use probit model due to the limitations of Linear Probability Model (LPM) to find out their desired outcome (Amornkitvikai, et al., 2012). Non-normality of disturbance term, heteroscedasticity of the disturbance term, lying the probability outside of the range 0-1 and lower value of R^2 lead to selection of probit model (Gujarati, 2009). The selected model was designed to find out the determinants of export. The structure of the probit model has been estimated to find out the factors probability of export deriving from the normal CDF (Cumulative Distribution Function) (Gujarati, 2009). According to the normal CDF, the probit model can be estimated as

$$P = P(Y = 1|X) = P(Z \leq \alpha + \beta X) = F(\alpha + \beta X)$$

Where Y is the dichotomous dependent variable representing 1 when a firm exports otherwise 0. P indicates the probability of export given firm and industry specific variables X (for example education of female workers, research and development expenditure, training, size of the firm, having a generator etc.) and Z is normally distributed with mean 0 and variance σ^2 i.e., $Z \sim N(0, \sigma^2)$ (Wooldridge, 2015). To find out the marginal effect that is the probability due to change in explanatory variables. To get the marginal effect we have to take derivative of the above-mentioned function. After taking derivative we get

$$\frac{dP_i}{dX_i} = (\alpha + \beta X)\beta_i$$

where $f(\alpha + \beta X)$ is the standard normal probability density function estimated at $\alpha + \beta X$ (Gujarati, 2009). To estimate the above probit model, marginal effect and all the statistical analysis, stata14 has been used.

Marginal Effect of any variable on the probability of export is measured as Marginal Effects at the Means (MEMS). Nonetheless, the interpretations of MEMS vary for variable to variable. The interpretation of a MEMS for a binary variable differs to the interpretation for a continuous variable. While marginal effect of binary variable captures only discrete change, continuous variable considers instantaneous rate of change. In case of binary variable dependent variable shows the predicted probability change due to change in independent variable from 0 to 1 or 1 to 0. The model MEMS for discrete variables can be explained as following

$$X_k = Pr(Y = 1|X, X_k = 1) - Pr(Y = 1|X, X_k = 0) ..$$

$$... ... ... \text{(MEMS for Discrete Variable)}$$

On the other hand, marginal change for continuous variable shows the approximate change in predicted probability due to 1 unit change of X_k from it's mean value (instantaneous rate of change). But MEMS for a continuous variable may or may not be close to the effect of P(Y=1) of one unit increase in X_k. For example, the change in probabilities of export due to change in education of the workers at various level will not be same. Theoretically, we can employ following formulas to calculate the marginal effect-

$$X_k = \text{limit}([Pr(Y = 1|X, X_k + \Delta X_k) - Pr(Y = 1|X, X_k)]/\Delta X_k) \text{ as } \Delta X_k \text{ gets closer to } 0 \dots$$

$$\dots\dots\dots\dots\dots\text{(MEMS for Continuous Variable)}$$

The above equation captures the effect continuous variables on predicted probability. More specifically, the effect on probability of export due to change in education of a worker say from class 9 to class 10 will not be same from change in education from 10 to 11. Therefore, both theoretical and empirical methodology lead us some sort of non-linear relationship between variables (Williams, 2012; Norton, 2004).

4.0 Results and Discussion

To identify the factors that facilitate the export we need to assess the constraints and obstacles faced by firms operating in Bangladesh. Table 2 represents the different kinds of obstacles that are hampering either the activities in current operation or activities regarding export operation. The mentioned table shows five different categories of obstacles ranging from no obstacles to very severe obstacles regarding to their current operation or current activities. Small and medium enterprises generally face much more obstacles than large companies. For example, getting loan from the formal or informal sources is relatively easier for larger companies than the small or medium enterprises (Beck & Demirguc-Kunt, 2006). Similarly larger firms can reduce the cost of production by employing economies of scale and division of labor. Division of labor refers to the production process that enables the workers to be skilled in specific task. This increases the efficiency of workers reducing the cost of production. Since the division of labor can be easily wielded in large firms, they enjoy the economies of scale compared to smaller one. On the other hand the smaller firms can't enjoy economies of scale and opportunities of division of labor like the way as the larger firms do. Such kind of barriers generally impedes the production process of the small and medium enterprises as well as their export process. And hence there are very few firms from small and medium categories can enjoy the opportunity of exporting their commodities in the foreign market. Since the present study has been dedicated to find out the factors that influence the probability of export of a firm, it tries to elucidate the obstacles that obstruct the production process or the export participation of the firms as well as their severity.

Table 2: Obstacles of essential factors faced by a firm in the current operations/ export activities*

Variables	No obstacles (% of total firm)	Minor obstacles (% of total firm)	Moderate obstacles (% of total firm)	Major obstacles (% of total firm)	Very severe obstacles (% of total firm)
Electricity	4.85	11.30	34.74	31.83	17.13
Telecommunications	71.43	18.31	6.80	2.15	0.49
Meeting export market product specifications and requirements	31.61	34.72	26.42	6.22	0.52
Price competitiveness in export markets	15.54	28.50	41.97	13.47	0.26
Production capacity to meet order quantities and delivery dates	34.46	26.94	18.39	18.39	1.55
Import regulations and non-tariff barriers in the export market	23.06	32.90	28.76	13.73	1.30
Transportation and delivery of raw materials and input used in production	25.91	33.68	29.79	8.03	2.33
Transportation and delivery of the exported goods	26.42	41.71	23.06	6.99	1.04
Transportation (in the current operation)	19.28	30.58	34.47	12.34	3.33
Customs and trade regulations (in the current operation)	29.61	33.56	28.43	6.38	1.11

*The options 'Does not apply' and 'Do not know' have been dropped due to very small percentage

According to the data shown in table 2, almost half of the total firms operating in Bangladesh found electricity as major or severe obstacle in their process. The World Bank annual report named

'Doing Business 2016'[5] support these findings. 'Doing Business 2016' reported that Bangladesh ranked 189 among 189 economies on the ease of getting access to electricity (The World Bank, 2016). Telecommunication facilities, on the other hand, has been identified as the most available factor in the production process although it might not play significant role in the production process. Besides the factors mentioned above, meeting export market product specifications and requirements, price competitiveness in export markets, production capacity to meet order quantities and delivery dates, import regulations and non-tariff barriers in the export market etc. have been identified as the obstacles ranging from no obstacle to very severe obstacle in the export market. Table 2 also shows that almost half of the total firms identified these obstacles as moderate to severe obstacles. As mentioned earlier, small and medium enterprises are facing more difficulties compared to large firms in terms of availability of these factors.

We have included small medium enterprise, female firm owner, no. of permanent full time employees, owning/sharing a generator, whether located in EPZ, research spending, firm experience (how many years is in operation), education of female workers, formal training, no. of skilled full time employees, improved marketing method, access to loan and improved organizational structure as independent variable in our probit regression. We tried to estimate how these factors affect the probability of export of the firm.

Table 3.: Probit Results

	Dependent Variable: Probability of export of a firm	
Explanatory variables	**Model-I**	**Model-II**
Constant	-0.64***	-0. 54 ***
	(0.24)	(0. 20)
SME	-0.90***	-0.91***
	(0.14)	(0.12)
Female Firm Owner	0.11	0.29 ***
	(0.15)	(0.12)
Permanent Full-time Employees	-0.00	-0.00
	(0.00)	(0.00)
Own/Share Generator	0.39***	0.16
	(0.14)	(0.10)
Located in EPZ	-0.12	-0.09
	(0.16)	(0.12)
Research Spending	0.23	0.38***
	(0.16)	(0.12)
Firm's Experience	-0.01	-0.01**
	(0.00)	(0.00)
Formal Training	0.49***	0.40***
	(0.13)	(0.10)

No. of Skilled Full-time Employees	0.00* (0.00)	0.00 (0.00)
Improved Marketing Method	-0.25* (0.14)	-0.07 (0.11)
Loan	0.10 (0.12)	0.25*** (0.90)
Improved organizational structure	0.43*** (0.14)	0.39*** (0.10)
Education of Workers		0.02 (0.02)
Education of Female Workers	0.09*** (0.03)	

Note: ***, **, * indicate statistical significance at the 1%, 5% and 10% level respectively. Robust standard errors are shown in parentheses.

We have estimated two probit regressions with almost similar variable except one. In Model-I among other explanatory variables, we have incorporated female education as independent variables. Model-II has similar explanatory variables except overall education of workers.

As previously mentioned, the size of the firm is one of the very important determinant whether a firm will export or not. (Wagner, 1995). The probability of export or participate in export in near future is higher for larger firms while small firms tend not to export. This may be due to fact that large firms can enjoy economies of scale, utilize economies of scope, can bear price or other shocks. Moreover, large firms have improved networking, technological advantage over small firms, easy access to finance etc. On the other hand, small firms face difficulty in access to finance, acquisition of new technology are very susceptible to adverse economic shock. Therefore, if a firm is small and medium in size it's probability of export is less than large. The coefficient is negative in both models and they are statistically significant at 1% level. Results show that if a firm is SME then its probability to participate in export is lower under Model-I than under Model-II.

If the owner of a firm is female then probability to export is higher than if a female does not own a firm. Female owned firms has higher chance of discontinuity due to many socio-economic constraints females usually face in third world (Watson & Robinson, 2003). Export based firms have to meet many required compliances and have to meet lot other requirements, hence female owned firms tend to take less risk. Therefore, we expect female-owned firms should have less probability of export as well as growth (Coad & Tamvada, 2012). But our results in both models do not meet our priori expectations in terms of sign of the coefficients. Though the coefficient in

Model-I is not statistically significant, it is significant in Model-II at 5% level of significance.

Profit maximizing firms have an incentive to hire temporary workers to minimize cost. Temporary workers do not get various facilities from the firms, therefore are cheap from firms' point of view. But exporting firm has to meet the criteria of certain labor compliance and standards. Consequently, there should be sizeable number of permanent employees. Despite the coefficients of permanent full-time employee are not statistically significant in both regressions, they show that having permanent employee affect probability of export negatively . This may be due to outsourcing practices followed by many export-oriented firms of Bangladesh.

Export oriented firms have to meet deadline therefore continuous supply of electricity is almost necessary for those firms. Continuous supply of electricity is positively related with production. Currently, power supply through governmental agencies or private power plant is not enough for the uninterrupted production in various industries. Therefore owning/sharing a generator increases the probability of export for firms, since these firms have the capacity to meet the deadline of their export orders.

EPZ have been created to boost export, therefore, we expect the firms located in EPZ have higher probability of export. But our result shows that if a firm located at EPZ has lower probability of export. This is unexpected and the coefficient is statistically insignificant. This may be due to fact that WB Enterprise Survey has surveyed fewer firms from EPZ. Specifically, only 195 firms (14%) out of 1245 firms were located in EPZ.

Investment in Research and Development (R&D) encourage new ideas, innovative products that ultimately cater the newer taste and variation among choice for the consumers. Therefore, R&D expenditure have positive and significant impact on the probability of export than firms that do not have research facility. The coefficient of research spending is positive but not statistically significant in Model-I. This may be due to the fact that, in Bangladesh firms' spending in R&D is very low compare to developed and other developing countries. In fact, very few firms in Bangladesh actually spend on research that may cause our coefficient insignificant.

If the education of female workers increases, then the probability of export for a firm also increases. Our result shows that firms having higher female worker education have higher

probability to export than their counterparts as shown in Model-I and result is statistically significant. Though the education of workers as a whole affect the probability of export positively, the result is not statistically significant in Model-II.

Our probit regression suggests that formal training has positive and significant impact on the probability of export and our results are significant in both regressions. Also the impact of this variable on the probability of participating in export is very low. If a firm train it's workers, the become more efficient and more skilled. These qualities ultimately enhance the probability of export.

If the no of skilled full-time employees is greater in a firm, that firm has higher probability of export than the firms that do not have such workers. But our result is significant in Model-I but not significant in Model-II. Skilled full-time employees in various firms of Bangladesh indicate that these workers process some sort of technical knowledge to influence production. Their contribution helps to operate production smoothly.

Improved marketing method should have positive impact on the probability of export. But our results do not fulfill priori expectation and sign is negative. Our result in first regression is significant but not significant in second regression. This may be due to the fact that Bangladeshi firms have failed to create their own brand name in world export market. But someone may argue that Bangladesh export a significant volume of garments and of late it ranked third largest exporter of garments. Our argument in this case is various countries choose Bangladesh due to cheap price of garments products. In addition to that, Bangladesh exports garment products that are usually income inelastic in nature. This income-inelasticity nature gives Bangladesh some sort of comparative advantage in terms of cheaper relative price than other competing countries.

Financial constrains may hinder production in many cases. Therefore, financial support is critical to export smoothly. Therefore, loan has positive impact to increase the probability of export for a firm. Also our results in second equation is statistically significant. Nevertheless, the coefficient of loan is not statistically significant in our first regression.

Improved organizational structure has positive and significant impact on the probability of export as found in the coefficients of both regressions. In Bangladesh, some dynamic firms have emerged

that have very structured organizational hierarchy, specialized personnel and management. The firms with systematic organizational structure mobilize its workers efficiently, manage production process professionally and ultimately produce goods in a cost-effective way.

Marginal effect helps us to understand the degree of change in dependent variable due to change in independent variable. The following table summarizes the marginal effect of our considered independent variables.

Table 4: Marginal Effects

| Explanatory variables | Dependent Variable: Probability of export of a firm | | | |
| | Model-I | | Model-II | |
	Mean of the explanatory variables	Marginal effects at means (Delta-method Std. Err.)	Mean of the explanatory variables	Marginal effects at means (Delta-method Std. Err.)
SME	0.53	-0.36*** (0.06)	0.70	-0.32*** (0.04)
Female Firm Owner	0.28	0.04*** (0.06)	0.20	0.10** (0.04)
Permanent Full-time Employees	427.59	-0.00* (0.00)	252.71	-0.00 (0.00)
Own/Share Generator	0.69	0.16*** (0.06)	0.58	0.06 (0.04)
Located in EPZ	0.17	-0.05 (0.07)	0.15	-0.03 (0.04)
Research Spending	0.19	0.09 (0.07)	0.17	0.13*** (0.04)
Firm's Experience	19.87	-0.00 (0.00)	20.92	-0.00** (0.00)
Formal Training	0.40	0.20*** (0.05)	0.32	0.14*** (0.04)
Skilled Full-time Employees	284.41	0.00*** (0.00)	164.63	0.00*** (0.00)
Improved Marketing Method	0.42	-0.10 * (0.06)	0.35	-0.03 (0.04)
Loan	0.53	0.04 (0.05)	0.46	0.09*** (0.03)
Improved Organizational Structure	0.43	0.17*** (0.06)	0.37	0.14*** (0.04)

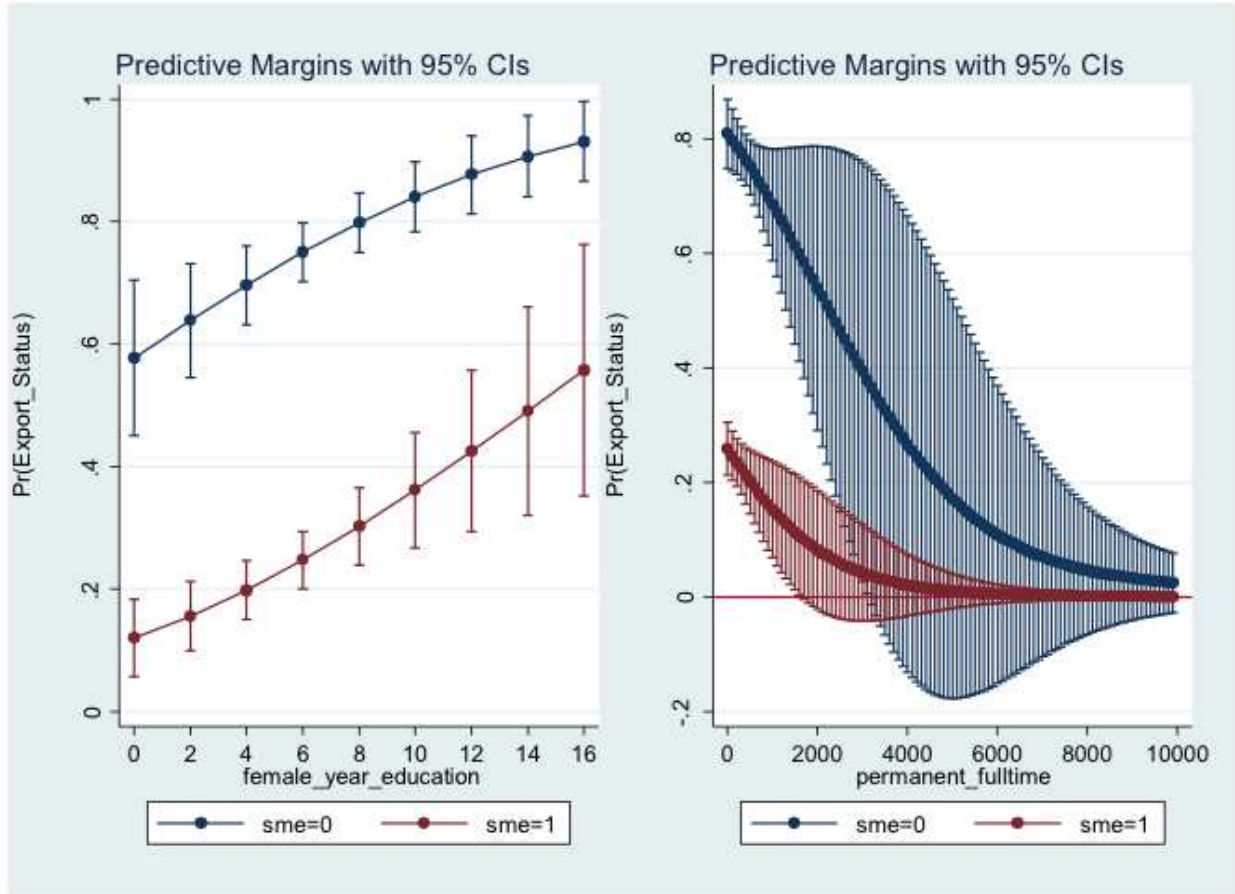|				
Years of worker's Education			6.62	0.01 (0.01)
Education of Female Workers	5.91	0.04 *** (0.01)		

Note: ***, **, * indicate statistical significance at the 1%, 5% and 10% level respectively

Above table shows the marginal effect of various explanatory variables on dependent variable at means. The probability of participating in export activities is 0.36% lower for a small firm than a large firm. It implies that small firms have negative and significant marginal effect on the export probability. Being a female owner has positive marginal impact on export probability, implies that female firm administrators are more efficient to meet deadline than their male counterpart. Marginal effect from first model shows that being a female firm owner increases the probability of export by 4%. But same phenomenon increases the probability of participating in export by 10% as shown in second regression. If permanent full-time employees increase by 1 person from its mean then it decreases the probability of export decreases by very small amount. This reflects that export market is very competitive and firms cannot afford many permanent employees. Also, it may be due to fact that in Bangladesh many exporting garments firm outsources their order to even smaller firms that does not have outward orientation. Alternative electricity supply during power cut positively affects the export probability. Therefore, if a firm owns/hires a generator from its no generator status, its probability of export increases by .16% as shown in the marginal effect of first model. But this marginal effect is lower and not significant in second model. If a firm located in EPZ then the probability of Export decreases as shown in marginal effect of both models. This is unexpected since we know EPZs have created to facilitate export or to provide infrastructure that assists firm to export. This is basically due to the small number of firms that were surveyed during the Enterprise survey. Marginal effect of research spending is positive in both models but not significant in Model-I. This implies if a firm invests in research from its no research spending status then probability of export increases by 13%. Older firms do not engage in newer initiatives and reluctant to search newer outward markets. Our result shows that if the firm age increases by one year then the probability of export decreases by very small percentage. This result is the contradiction of dynamic economies of scale of new trade theory which implies that older firms have cost advantage of newer firms. Majority of workers of garments industry of Bangladesh are women. Therefore, the marginal effect of having an additional year of education of those female workers increases the probability of export. Our result suggests that if female worker's education

increases by one year then the probability of export increases by 4%. If a firm train their workers compare to no training situation then the probability of export increases by .20%. So, the marginal effect of formal training on the probability of export is positive and statistically significant in both models. Therefore, skill enhancing training give the firm advantage to exploit those skills and export more. The marginal effect of skilled full-time employees on probability of export is positive, but the magnitude is very small. Though we expect improved marketing method should have some positive marginal impact on the probability of export, our result shows the opposite. This implies that Bangladeshi firms have failed to create their own branding, hence spend less on advertising and improved marketing method to boost their export. The marginal effect of loan on probability of export is positive in both models though it is not statistically significant in first model. Improved organizational structure increases the probability of export by 17% in first model and by 14% in second model. Both marginal effects are statistically significant. This implies organized staffing helps firms to manage workers efficiently and can deliver foreign buy orders timely.

Since our regressions include independent variables both dummy and continuous variables, therefore marginal effect of will not be constant in all cases. For example, we have presented the marginal effect of female years of education and permanent full-time employees graphically in figure-1 to understand the presence of non-linearity in marginal effect on export.

Figure1: Marginal Effects of female years of education and permanent full time employees on the probability of export

Predictive Margins with 95% CIs

Above graph illustrates that effect of increasing education for female workers for both SME and large firms. For large firms, marginal effect of increased education of female workers increase at a decreasing rate. However marginal effect increases at an increasing rate for the large firms.

The effect of increasing permanent full-time employees on export is negative but it decreases probability of export at a sharper rate if a firm is large. On the contrary, it decreases at relatively slower rate if SME increase full time permanent employees.

5.0 Conclusion and Policy Implications

Firms do not make decisions to export arbitrarily, rather this decision is the result of having some

characteristics that entice firms to make profit through entering into foreign market what we call export. These characteristics provide firms some sort of competitive advantage over other existing firms to exploit the total global demand of any particular commodity. In a nutshell, these properties help firms to export rather than focusing only on local demand. Therefore, these characteristics helps firms to be even bigger, even more organized and even more competitive by hiring the most skilled portion of the labor force. Precisely, formal training, bigger sizes of the firm, improved organizational structure and education level of female workers have positive and significant export enhancing effect. As a result, being a large firm are relatively advantageous situation to export in foreign market than a small firm. Making workers more skilled through training are export heightening. Educated workers are more skilled and therefore efficient. These skill training and education have positive externalities that are reflected in the reduction of average cost. Consequently, firms become more competitive and get the courage to enter into foreign market. Organized staffing and efficient management of human resources boost production and aid to meet export requirement. Hence the firms those have a wish to export in near future may focus on these characteristics to create their export competitiveness in future.

The active firms of Bangladesh that intends to participate in export market need to arrange formal training regularly for their employees. As lower productivity in manufacturing industry remains one of the concern areas where firms have been struggling for many years. In this context, relevant training of the employees will eventually boost up productivity of employees. Even related firms of any particular subsector may arrange training jointly to improve their productivity as a whole. Both ministries, relevant departments, agencies and private entrepreneurs can also arrange training jointly with collaboration of firms.

Improved organizational structure and access to loan facility will give local firms some sort of edge over foreign firms and will put them in advantageous position in export market. Therefore, the firms those aspire to operate in global market need to maintain systematic organizational structure. Additionally, easy access to loan facility will ensure uninterrupted operation for the firms that intends to operate in export market.

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