ISSN(E):2522-2260
ISSN(P):2522-2252

Indexing/Abstracting

Published by

Department of Quantitative Methods

School of Business and Economics

University of Management and Technology, Lahore, Pakistan

JQM Journal of Quantitative Methods

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Manuscript Information

Citation in APA Style

Adada, A. M. (2018). Determinants of Export Survival: The Case of Ghanaian Manufacturers. *Journal of Quantitative Methods*, *2*(1), 37-61.

This manuscript contains references to 33 other manuscripts.

The online version of this manuscript is available at

http://journals.umt.edu.pk/sbe/jqm/volume2issue1.aspx#

DOI: https://10.29145/2018/jqm/020102

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Determinants of Export Survival: The Case of Ghanaian Manufacturers

Abdul Rahim Adada Mohammed[1]

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Abstract

In this study, we sought to investigate the factors that affect the export survival of Ghanaian manufacturing firms, using the survival (or duration) analysis technique. The study used a panel dataset (of Ghanaian manufacturing firms) spanning from 1991 to 1998, obtained from the regional program for enterprise development (RPED)/Ghana Manufacturing Enterprise surveys, which was jointly conducted by the Centre for the Study of African Economies (CSAE), the University of Oxford, the University of Ghana (Legon), and the Ghana Statistical Office. Our findings suggest that median duration of Ghanaian manufacturers in export markets is 5-6 years. The study also reveals that the longer a firm remains exporting, the greater the likelihood of survival in exporting. Other factors including firm age, size and export intensity each enhance the probability of firms' survival in exporting while exporting a final product reduces the probability of survival.

Keywords: survival analysis, export survival, Ghanaian manufacturing firms, panel data, and market.

1. Introduction

Recent literature on international trade suggests that maintaining and prolonging export relationships after they have been created is an important condition for export success. Some economists argue that the main reason for the lack of export growth among developing countries is their inability to maintain export relationships for long periods (Besedes & Blyde, 2010). Extended export durations have two important potential benefits: they help in expanding and intensifying the existing export relationships (Fugazza & Molina, 2009), as a result of which efficiency gains

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may accrue to the exporting firms. Such gains in efficiency are likely to have positive implications for aggregate export performance and industrial growth. Besides, such extended relationships may create platforms upon which new export relationships are created. Until recently, the issue of trade duration has been ignored both in theoretical and empirical literature (Fugazza & Molina, 2009).

Most trade models implicitly assume that trade will persist once it is established, which is surprising given that most of the empirical findings on trade relationships for developing countries suggest short-lived trade spells. For instance, Besedes and Prusa (2007), in a study of manufacturing exports of 46 developed and developing countries, found the median export survival period to be 1-2 years. Likewise, Cadot et al. (2010) found that only one out of five new export relationships from Malawi, Mali, Senegal, and Tanzania survive the first year.

There is no specific study on trade relationships and/or export duration for Ghanaian firms. However, available findings suggest high failure rates for Ghanaian manufacturers domestically. For instance, CEPA (2000) reported that enterprise failures increased by 80% between 1995 and 1999, consistent with Association of Ghana Industries' report of a decline in its membership from 1,500 to 500 over the same period. Given these quite alarming statistics, it will be interesting to investigate how exporting firms fared during this period.

Furthermore, data from the Regional Program on Enterprise Development surveys on manufacturing firms in Ghana reveal some important information about the exporting behaviour of Ghanaian manufacturing firms. Out of two hundred (200) firms that participated in the first wave of the surveys in 1991, eighteen (18) were exporters. By 1998, only seven (7) of the 18 exporters were still exporting; eight (8) had stopped exporting while three (3) had stopped responding to the survey. The year 1997 recorded the largest number of failures with twelve firms exiting their export status.

Overall, ten firms had one-year complete single exporting spells, excluding all exporters who entered in 1998. Nine (9) firms

had two-year complete single exporting spells. Only two of the firms that began exporting in 1991 continued to export each year until the end of 1998. Similarly, three firms that began exporting in 1993 did so regularly until the end of 1998. Two deductions could be made from this: (1) Relatively few firms export manufactured products from Ghana and this probably explains why aggregate export of manufactured goods from Ghana is relatively insignificant; and (2) Ghanaian manufacturing firms that export do not survive long in export markets, thus limiting the benefits of exporting to the firms and also limiting the growth of Ghana's manufactured exports.

It is clear that a study on trade duration and survival for Ghana is necessary. Such a study would serve as basis for policy recommendations with respect to entry of manufacturing firms into international markets, as well as their extended stay in those markets. Thus, the objective of this study is to investigate the survival of Ghanaian manufacturers in export markets. We will apply duration models of the survival analysis technique to analyze the impact of firm, industry and export markets' characteristics on export survival of Ghana's manufacturing firms. The paper uses a panel data of a sample of Ghanaian export manufacturing firms, obtained from the Regional Program for Enterprise Development surveys.

We hope to establish empirical facts about the export survival duration of Ghanaian manufacturers and its determinants. Such findings should guide any future attempt (policy-wise) to expand and sustain manufacturing exports for the benefit of the Ghanaian economy. However, there are two main limitations of the study (both of them related to the dataset used) worthy of note: (1) the dataset used for the estimation did not include the specific destination markets (countries), making it impossible to include some variables such as the size of the destination country, distance, country risk, etc.; and (2) the dataset is not recent (collected between 1991 and 1998), and this is generally related to the challenges that a lot of developing countries face regarding data collection and availability.

In spite of these limitations, we expect the study make a relevant contribution in relation to the above-mentioned

objective(s). The paper is organized in six sections. Section two discusses the theoretical and empirical literature on survival of firms in industries and in export markets. Section three presents the econometric method used in the analysis of firms' survival in export markets and the choice of the relevant explanatory variables. In section four, the paper takes a closer look at the data used and then the summary statistics. Section five presents and discusses the results from the model estimation and undertakes a sensitivity analysis to check for robustness. Section six contains the conclusion and recommendations to policy makers.

2. Theoretical Framework

2.1. Passive and Active Learning Models

The passive learning theory (Jovanovic, 1982) suggests that the firms discover about their efficiency only after they begin to operate in an industry. It argues that whether a firm belongs to an industry or not is an inherent characteristic that can be discovered through experience. Thus, firm entry and exit can be described as a natural selection process or a process in which only the fittest firms survive.

The active learning model (Ericson & Pakes, 1995) on the other hand, relates firms' growth and survival prospects to their participation in productivity-enhancing activities. According to this theory, a firm's suitability to a given industry changes during its term in the industry. This change is motivated by the successful completion of a research and development (R&D) project, development and successful marketing of a new product, hiring a success-driven manager or raising workers' morale. A change driven by any of these factors will be favourable to the firm's suitability and hence will prolong its stay in the industry. Otherwise, the firms will exit. Thus, this theory ultimately predicts a continual entry and exit even if industry is stable over time.

The predictions of both the passive and active learning theories imply that age and size are positively related to export persistence. Krugman (1980, 1984) argues that the positive relationship between firm size and export persistence is due to economies of scale advantage that larger firms enjoy over smaller

firms. The above argument is further supported by Bonaccorsi (1992) who argues that small firms are disadvantaged in terms of exporting because of: (1) limited resources in terms of management, finance, research and development and marketing; (2) limited or no economies of scale in manufacturing and export marketing; and (3) the existence of the perception of high risk in international activity.

Again, both theories suggest that the risk of exit from export markets reduces over time. Thus, the longer a firm remains an exporter, the lower the probability that the firm will exit the export market. This is supported by the suggestion that firms that enter foreign markets incur high sunk entry costs (Dixit, 1989), related to research on foreign demand and competition, establishing external links, effecting changes to products and packaging characteristics to meet foreign demand and so on.

Again, exporting firms incur updating costs related to changing market and distributional channels, adapting of products to new export environments and so on. These updating costs contribute to the firms' accumulation of knowledge from international buyers and from competitors as well, which improves the performance of the firms and increases their chance of survival in export markets (Esteve-Perez, et al., 2007).

Manez-Castillejo, Rochina-Barrachina and Sanchis-Llopis (2004) suggest that knowledge acquired by a firm through exporting depreciates rapidly once that firm stops exporting. Thus given all the costs that firms incur by exporting and the possibility of losing (over a short period of time) the expertise they acquire through exporting when they exit exports markets, firms are likely to persist in their exporting behaviour.

The active learning theory suggests that firms that have high intensity of research and development activities are more likely to survive in export markets than those with lower R&D intensity. This is because, as Kleinschmidt and Cooper (1990) and Kotable (1990) argue, R&D activity (if successful) enhances firms' competitive advantage and thus will enhance their export survival chances. Esteve-Perez et al. (2007) further suggest that R&D intensity is a proxy for product differentiation. Since firms that

invest in R&D are more competitive (due to differentiated products), such firms would tend to have longer export spells. Finally, there is also a relationship between the productivity of an exporting firm and its export survival.

Audretsch (1991, 1995) conceptualizes that the probability of any firm surviving in an industry is dependent on the firm's price-cost margin. Given that an increase in a firm's productivity causes it to produce at a lower average cost (which in turn increases its price-cost margin), it holds that more productive firms are more likely to survive than less productive ones.

2.2. Empirical Literature

In recent times, there have been few studies that have used the survival analysis technique to study the nature of trade durations and the effects of firm, industry, and export market characteristics on the survival of firms in export markets. In terms of the length of trade relationships, Besedes and Prusa (2006), using data on U.S. imports, revealed that trade relationships were short-lived with the median duration being on the order of two to four years. Volpe-Martincus and Carballo (2009) also found that the median trade duration for new Peruvian exporting firms was just one year. Interestingly, while Esteve-Perez et al. (2007) found that the median export duration of Spanish manufacturers is ten years, Esteve-Perez, Pallardo and Requena (2008), in a different study, found it to be just two years.

For most of the studies, their findings – especially with respect to factors that influence export survival – are consistent with theory. Studies by Esteve-Perez et al. (2007) and Esteve-Perez, Pallardo and Requena (2008) both found that the longer a firm stays in exporting the lower the risk of exit. The positive relationship between size and export persistence has been confirmed by Esteve-Perez et al. (2007), Esteve-Perez, Pallardo and Requena (2008), and Volpe-Martincus and Carballo (2009). Again, Esteve-Perez, Pallardo and Requena (2008) and Volpe-Martincus and Carballo (2009) confirmed that older firms survive longer exporting spells than the younger firms.

Other factors found to have a positive effect on export survival include productivity, export intensity, export of final consumer goods and exporting to countries that are geographically closer or are within the same regional block with the exporting firm's country.

3. Empirical Methodology

3.1. Econometric Method (Survival Analysis)

Survival analysis is a technique that models time until an event occurs, given a set of covariates. The subject of analysis for this study is a Ghanaian manufacturing firm that exports. Thus, we model the exit of these manufacturing firms from export markets given survival up to a certain time. The export survival data available is organized in a discrete (annual) form, though it may be continuous in nature. Thus, the study will use the discrete time methods to model survival times, where it will treat survival times as banded in discrete intervals of time (that is, numbers of years).

Time takes only positive integers $t = 1,2,3,\ldots$ and the interval t is $(t-1,t)$. A total of n independent firms $(i = 1,\ldots,n)$ are observed with the observations beginning at some starting point $t = 1$. The observation continues until t_i, at which point either the firm experiences an exit from exporting or is censored. There is a dummy variable c_i that is equal to one if exporter i's exporting spell is complete and zero if right-censored. There is a vector of explanatory variable/covariates, X_{it}, which may take on different values at different discrete times. At each point in discrete time, there is only one value for each of the explanatory variables.

The discrete-time hazard rate, h_{it}, which is the probability that a firm exits exporting at time t, given that it has not yet exited, is specified as:

$$h_{it} = \Pr[T_i = t \mid T_i > t, X_{it}] \quad (1)$$

$T =$ The discrete random variable giving the uncensored time event occurrence. According Holford (1976) and Prentice and

Gloecker (1978), if the data are assumed to be generated by the continuous time proportional hazard model such that $\log h(t,X) = \gamma(t) + \beta' X$, from the general form $h(t,X) = h_0(t)\ell^{\beta' X}$, then the corresponding discrete time hazard function is given by:

$$h_{it} = 1 - \exp[-\exp(\gamma_t + \beta' X_{it}] \tag{2}$$

Equation (2) can be solved to yield a complementary log-log function of the form

$$\log[-\log(1-h_{it})] = \gamma_t + \beta' X_{it} \tag{3}$$

γ_t is the baseline hazard which summarizes the pattern of duration dependence in the discrete time hazard. Maximum likelihood estimation of the model is possible in discrete time without any restrictions on γ_t. According to Jenkins (2004), the likelihood contribution for a censored exporting spell is given by the discrete time survivor function

$$S_i(t) = \Pr(T_i > t) = \prod_{j=1}^{t}(1-h_{ij}) \tag{4}$$

Further, the likelihood contribution for a complete spell is given by the discrete time density function

$$f_i(t) = \Pr(T_i = t) = h_{it} S_i(t-1) = \frac{h_{it}}{1-h_{it}} \prod_{j=1}^{t}(1-h_j) \tag{5}$$

Thus, the likelihood function for the entire sample may be written as

$$L = \prod_{i=1}^{n} [\Pr(T_i = t_i)]^{c_i} [\Pr(T_i > t_i)]^{1-c_i}$$

$$= \prod_{i=1}^{n} \left[\left(\frac{h_{it}}{1-h_{it}} \right) \prod_{j=1}^{t}(1-h_j) \right]^{c_i} \left[\prod_{j=1}^{t}(1-h_j) \right]^{1-c_i}$$

$$= \prod_{i=1}^{n} \left[\left(\frac{h_{it}}{1-h_{it}} \right)^{c_i} \prod_{j=1}^{t} (1-h_j) \right] \tag{6}$$

Taking logarithm of equation (6) gives

$$\log L = \sum_{i=1}^{n} c_i \log \left[\frac{h_{it}}{1-h_{it}} \right] + \sum_{i=1}^{n} \sum_{j=1}^{t} \log(1-h_{ij}) \tag{7}$$

According to Allison (1982), we can substitute the discrete time hazard function into equation (7) and then maximize $\log L$ with respect to $\gamma_t (t = 1,2,\ldots)$ and β. He argues that a further manipulation of equation (7) such that we define a dummy variable y_{it} (equal to one if firm i experiences exit at time t and zero if otherwise) will yield

$$\log L = \sum_{i=1}^{n} \sum_{j=1}^{t} y_{it} \log \left[\frac{h_{ij}}{1-h_{ij}} \right] + \sum_{i=1}^{n} \sum_{j=1}^{t} \log(1-h_{ij})$$

$$= \sum_{i=1}^{n} \sum_{j=1}^{t} \left[y_{it} \log h_{ij} + (1-y_{it}) \log(1-h_{ij}) \right] \tag{8}$$

Equation (8) is just the standard likelihood function for a binary regression model in which y_{it} is the dependent variable.

In this model, duration dependence will be measured non-parametrically. Thus, duration-interval-specific dummy variables are created for each spell year at risk. For this study, there are eight (8) duration intervals and hence eight duration dummy variables are created. For duration intervals in which there are no events (failures), they are incorporated into other duration interval dummy variables with small number of events to make estimation possible. According to Esteve-Perez et al. (2007), incorporating unobserved heterogeneity into equation (2) will give

$$h_{it} = 1 - \exp\left[-\exp(\gamma_t + \beta' X_{it} + u_i \right] \tag{9}$$

where $u_i = \ln v_i$ and v_i enters the proportional hazard model multiplicatively such that $h(t, X) = h_0(t)\ell^{\beta' X} v_i$. v is assumed to follow a gamma distribution with a unit mean and variance σ^2 which will be estimated from the data. u_i summarizes the impact of possible omitted variables on the hazard rate, whether intrinsically unobservable or unobserved from the data at hand. Failure to capture unobserved heterogeneity may lead to the under-estimation of the true proportional response of the hazard to a change in the regressors; and over-estimation (under-estimation) of the degree of negative (positive) duration dependence in the hazard (Esteve-Perez et al., 2007).

3.2. Explanatory Variables

Time is measured non-parametrically. Thus, duration dummy variables are featured in the model to capture the effect of time. Given that there is a maximum of eight years discrete time duration interval, the dummy variables are eight. However, some years are merged into others because they had no events occurring in them. Years 3, 4, 5, 6, 7 and 8 are merged while years 1 and 2 stand on their own. Thus, in total, there are 3 dummy variables to capture the effect of time. Variables including firm age, size, productivity, export intensity and foreign capital participation are classified as firm characteristics while capital intensity and type of product being exported form industry characteristics.

Age is measured as the firm's years of existence as at the time of the survey. It enters the model as a dummy variable which takes the value one (1) if the firm is at least ten years old and takes the value zero (0) if the firm is less than ten years old. Firm size is measured by the number of workers the firm employs. It is also a dummy variable which takes the value of one if the number of employees is greater than or equal to hundred (100) and a value of zero if otherwise. Firms that employ at least 100 employees are considered large while those that employ less than 100 people are considered small. For issues related to data availability, firm productivity is measured as output per unit of labour (gross output labour productivity).

Foreign capital participation is captured in the model as a dummy variable that takes the value one (1) if a firm has any foreign investors in its ownership structure and zero (0) if not. Export intensity refers to the percentage of a firm's total output that is exported and is measured as a dummy variable that takes the value one (1) if the firm exports at least 50% of its total output and zero (0) if otherwise.

For industry characteristics, capital intensity is measured as fixed asset (value of capital stock) per employee. To minimize the problems associated with this measure, the value of capital stock at constant prices is used rather than the value of capital stock at current prices. To capture the effect of the type of product (that is, whether final consumer good or an intermediate good) being exported, a dummy variable is created that is equal to 1 if the firms exports a final good and is equal to 0 if otherwise.

Final goods here are represented by furniture, food (food and drink) and garment. Finally, to measure the effect of geographical proximity on export survival, a dummy variable is created that is equal to one if firms export at least 50% of their total exports to other African countries and is equal to zero if otherwise. This is as far as the available data can take us.

Thus, based on the discussions above, in equations (2) and (3) is specified as:

$$\begin{aligned}\beta' X_{i,t} = {} & \beta_1 age1 + \beta_2 size1 + \beta_3 prod \\ & + \beta_4 xintens + \beta_5 for \\ & + \beta_6 capinters + \beta_7 final \\ & + \beta_8 exafr\end{aligned}$$

where *age1* = dummy variable for age of firm; $size1 =$ dummy variable for size of the firm; $prod =$ the firm's productivity level; $xintens =$ dummy variable representing export intensity; $for =$ dummy variable representing foreign capital participation; dummy variable specifying the type of product being exported; and $exafr =$ dummy variable for proximity of export destination.

4. Data and Descriptive Statistics

4.1. Data

The dataset used in this study was derived from the regional program for enterprise development (RPED)/Ghana Manufacturing Enterprise surveys. The surveys were conducted by the joint collaboration of the Centre for the Study of African Economies (CSAE), the University of Oxford, the University of Ghana (Legon), and the Ghana Statistical Office.

The Ghana Manufacturing Enterprise survey is a continuation of the regional program for enterprise development survey which ended in 1995. In each year, approximately 200 firms were surveyed. Among the major areas of the manufacturing sector covered include wood and furniture, metalworking, food processing, textiles and garments. The dataset accessible to us for this study runs from 1991 to 1998. There were 18 exporting firms in the first year of the survey out of the 200 firms sampled. By 1998, the number of firms in the sample that were exporting had increased to 44. The unit of observation for this study is the continual number of years a Ghanaian manufacturing firm exports.

The advantage of using the RPED surveys as the source of data is that firms and their characteristics are consistently observed over the eight-year period, thus giving us the basis to observe both the exporting behaviour of the firms over the survey period and the factors that influence this behaviour. The details of the data give the indication that some firms stopped participating in the survey along the way. Hence, there is no information about them from the time they stopped till when the survey ended. In this study those firms are excluded.

4.2. Descriptive Statistics

From the data, 83 firms that had enjoyed at least one export stint in their operation. Of these, 43 started as small firms while 39 started as large firms. The wood and furniture subsector had the largest numbers of both the small and large firm categories; with 21 large firms and 16 small firms (Table 1).

Table 1: Firm Characteristics: By Size

Characteristics	Large (Number of Employees ≥100)	Small (Number of Employees <100)	All
Sector			
Garments and Textiles	4	8	12
Wood and Furniture	21	16	37
Metal, chemicals and Machines	7	14	21
Food, Drink and Bakery	7	5	12
Total	39	43	82
Age			
Young (<10years)	10	15	25
Old (≥10 years)	25	27	52
Total	35	42	77
Foreign Capital Participation			
≥50%	18	7	25
<50% & >0%	2	5	7
=0%	18	29	47
Total	38	41	79

Source: Author's elaboration based on RPED/GMES surveys.

The bakery subsector had no large firm operating in it while it had only 1 small firm operating, thus making it the subsector with the lowest number of exporting firms. Generally, there were 10 large firms that started young and 25 that started old. Within the small-firm category, 15 firms originally started young while 27 started old. There were 32 firms with some foreign capital investment and 47 entirely domestically-owned.

Of the firms with foreign capital participation, 25 had at least 50% foreign stake while only 7 had foreign stake less than 50% (Table 1). For the model estimation, there were 183 observations corresponding to 57 firms. There were 21 complete spells, implying that there were a total of 21 failures. There were no events in duration-intervals 3, 5, 7 and 8 while duration-interval

1 recorded the highest number of deaths (9) followed by duration-interval 2 with 7. Approximately 56% of the exporters were still alive (or 44% were dead) after 5 years while 47% remained alive after 6 years. This implies that the median duration is 5-6 years. This is quite high relative to the median duration for some other developing countries as reported in some empirical works.

5. Discussion of Results and Robustness Check

5.1. Presentation and Discussion of Results

As in Table 2, three complementary log-log models were estimated. The first model captures the effect of time only; without any other covariate. The second model is estimated with both time and other necessary covariates but under the assumption of no unobserved heterogeneity. The third model is estimated just as the second but under the assumption of the existence of a gamma distributed individual heterogeneity term. All the three models treat the baseline hazard non-parametrically.

Given that there are no events in periods 3, 5, 7 and 8, only three dummy variables are used for the treatment of time: d1 for duration-interval 1, d2 for duration-interval 2 and d345678 for duration-intervals 3, 4, 5, 6, 7, and 8 combined. In model 3, a test of significance of the unobserved heterogeneity shows that the null hypothesis cannot be rejected. The chi-squared statistic had a p-value of 0.5 (Table 2). This means there is no unobserved heterogeneity for the firms. Thus, the first two models in Table 2 are used in the discussion of the results from the estimation of the discrete time proportional hazard model.

Given that larger (less negative) values are associated with higher hazards, the estimated model (model 1 of Table 2) exhibits negative duration dependence. That is, the hazard generally falls over time. To check the significance of the changes in hazards over time, a test of equality was carried out. The results of the test show that the difference between the hazards for d1 and d2 is statistically insignificant. However, there are statistically significant differences between hazards of d1 and d345678 as well as between d2 and d345678. The existence of negative duration dependence in the

estimated model implies that the export survival of Ghanaian manufacturers is enhanced the longer they remain exporting. This confirms theoretical predictions as derived from both the passive and active learning models (and justified by Dixit, 1989).

The nature of the duration dependence in the estimated model reveals some important details with regards to the learning process of the exporting firms. First, the fact that the hazard is statistically the same for the first two duration interval periods implies that the initial entry cost that exporting firms incur allows them to export for two years without incurring further updating costs. This means that for the first two years, updating cost is small and thus learning-by-exporting is slow (Esteve-Perez et al., 2007).

However from the third year, the hazard rate drops significantly, which implies that the updating costs feature more into firms' export operations after the second year. This significantly increases potential cost of re-entry, accelerates learning-by-exporting, and delays exit from exporting (Esteve-Perez et al., 2007).

In terms of firm characteristics, model 2 (of Table 2) reveals that the older firms have lower hazard rate than younger ones. Older exporting firms have 84.5% lower hazards than younger exporting firms (Table 3). This result is consistent with the active learning theory and empirical findings by Esteve-Perez et al. (2007) and Volpe-Martincus and Carballo (2009) among others.

Older firms have more experience in operation, more established networks and better knowledge of the business terrain. This gives them the ability to survive the challenges that confront them in the course of doing business relative to younger firms. It is also revealed that the hazard rate of larger firms is 89.2% lower than that of smaller firms (Table 3). This result is consistent with theoretical prediction and empirical findings by Esteve-Perez et al. (2007) and Volpe-Martincus and Carballo (2009) among others.

Table 2: Results of Models Estimation

Variables	Model 1	Model 2	Model 3 (with frailty)
Duration Dependence			
d1	-1.761 (0.000)*	-0.619(0.482)	-0.6185 (0.537)
d2	-1.562 (0.000)*	0.915 (0.365)	0.915 (0.373)
d345678	-2.850 (0.000)*	-0.362 (0.691)	-0.362 (0.715)
Firm Characteristics			
prod		-0.000 (0.545)	-0.000 (0.498)
xintens		-2.588 (0.001)*	-2.588 (0.001)*
for2		0.223 (0.775)	0.223 (0.815)
size1		-2.222 (0.005)*	-2.222 (0.007)*
age1		-1.866 (0.012)**	-1.866 (0.001)**
Industry Characteristics			
final		1.973 (0.007)*	1.973 (0.031)**
capintens		-0.000 (0.314)	-0.000 (0.328)
Export Market Characteristics		0.491(0.454)	
Exafr			0.491 (0.505)
Frailty/Unobserved Heterogeneity			
Coefficient of Gamma variance = -0.00000078	LR test of Gamma var. = 0	Prob.>=chibar2 = 0.5	
Log likelihood	-62.061	-32.821	-32.821
Number of observations	183	155	155

Source: Author's elaboration based on RPED/GMES surveys
Note: *- significant at 1% and **- significant at 5%

Larger firms are better placed to survive because they tend to have better conditions for operations manifested in terms of access to quality inputs, favourable tax conditions and easier access to information as well as economies of scale (and production at minimum efficient scale). These combine to enhance their profitability and persistence in exporting. The results further suggest that firms with higher export intensity have their export survival prospects extended by 92.5% as compared to those with lower export intensity. High export intensity leads to higher and quicker accumulation of knowledge about exporting and foreign demand and taste (Castellani, 2002). This acquired knowledge improves firms' efficiency, thus leading to enhanced export survival prospects.

From the estimation, productivity (prod) does not influence survival prospect of firms in exporting. This implies that the self-selection hypothesis, which suggests that only efficient firms are self-selected into exporting, does not hold in this case. It also implies that although most exporters are highly productive compared to non-exporters, high productivity is not necessarily a pre-condition for survival in export markets but rather a by-product of exporting. This conclusion follows the conclusion from the work of Van Biesebroeck (2005), which suggests that exporters in sub-Saharan Africa are more productive than non-exporters in the same industry, and that these exporters improve their performance levels after they enter foreign markets. The work further suggests that African exporters do not just have high post-entry productivity levels but also high post-entry productivity growth.

Further, foreign capital participation is not a significant determinant of export survival (see model 2 in Table 2). A possible explanation for this is that none of the two hypotheses (exporting platform and market-seeking), proposed by Dunning (1977, 1981), dominates the other as the basis for foreign direct investment into Ghanaian manufacturing firms that export. While some of the foreign investors invest to exploit Ghana's comparative advantages in exporting, others invest merely as a means to penetrate the Ghanaian market. In terms of the industry characteristics, the results suggest that firms that export final product have a higher hazard rate than firms that export other products.

From Table 3, final products exporters have a hazard rate that is 7.2 times higher than non-final product exporters. Rauch (1999) suggests that export of final consumer goods is associated with higher initial sunk costs because it requires adjustment of product features to suit (foreign) market demand and the establishment of distribution networks that meet the needs of the specific product. Thus, the cost of re-entry is high for such exporters. This prolongs the survival of the exporters of final products relative to exporters of other products.

Table 3: Variables that are Significant with their Coefficients in Exponents

Variable	Exp (β)
age1	0.155 (0.012)*
size1	0.108 (0.005)*
Xintens	0.075 (0.001)*
Final	7.195 (0.007)*

Source: Author's elaboration based on RPED/GMES surveys
Note: *- Significant at 1%

However, as our results suggest, final products exporters are more likely to exit than non-final product exporters. This perhaps reiterates the fact that exporting manufacturing final consumer goods from Ghana comes with its unique challenges. In the first instance, most countries, especially developed, have high quality standards for the acceptance of final consumer goods from other countries. Thus, exporters of final consumer goods incur extra costs in trying to upgrade their products to those standards. These costs are quite separate from the normal periodic updating costs that exporters incur to adapt their products to the changing demand conditions in foreign markets, among other things. In effect, exporters of final consumer goods incur higher per unit costs than those who export intermediate goods. This gives lower price-cost margins and makes it more likely that those who enter foreign markets with final consumer goods will find it less profitable to continue exporting after some time.

In addition, the final consumer goods sub-sector is one area that has a lot of competition. Even domestically, some

manufacturing products have been out-competed by similar products from the outside world, especially the relatively cheaper products from the Asian countries (such as China). This makes it even more likely that exporters of final consumer goods will be out-competed in foreign markets. These probably explain why exporters of intermediate manufacturing goods have higher export survival rates than exporters of final consumer manufacturing goods.

Capital intensity has no effect on the export survival of Ghanaian exporters of manufactures. Thus, with regards to export survival of firms, it does not matter whether the exporting firm operates in a highly capital intensive industry or in a less capital intensive industry. This is possibly because most of the products classified as manufactured exports from Ghana are not high technology products but products that require very minimal levels of capital acquisition to produce. For instance, the products that are very prominent in the manufactured exports category are wood, furniture, cocoa pastes, garments etc. Thus, the differences in the technology requirements for the various categories of manufacturing exports are not that significant to make a difference in export survival prospects.

Finally, the result from Table 2 shows that geographic proximity is not a significant determinant of export survival. This implies that export survival does not depend on whether a Ghanaian manufacturing exporter exports to another African country or to the rest of the world. Though Ghana is closer (geographically and socially) to other African countries than to other geographical territories such as the EU and the US, Ghanaian exporters have not been able to take advantage of this geographic proximity. This is because exporting within Africa comes with its own challenges.

Trading within Africa is associated with high business cost for firms – related to inadequate infrastructure for communication, transportation and power (Sako, 2006). Efforts at regional integration have been sluggish over the years, thus limiting the benefits associated with geographical proximity within the context of trade. On the other hand, trade with other regions, especially the

US and EU, is enhanced by well-functioning trade agreements, and ease due to technological advancements. In effect, the benefits of exporting to other Africa countries, related to social similarities and geographic proximity, are offset by the combine effect of the benefits associated with better trade arrangements with the EU, US, and other countries, and the challenges of trading with other African countries.

5.2. Robustness Check

In checking for the robustness of the results obtained from the estimation of the proportional discrete time hazard model, we used an alternative assumption of the model specification. A logistic model is specified in place of the initial complementary log-log model. For small hazard rates both the complementary log-log and logit specifications yield similar results (Jenkins, 2004). Thus, the purpose was to assess the sensitivity of the estimates to the change in assumption about the behaviour of the continuous hazards within intervals.

Table 4: Estimated Results Using a Logistic Model

Variables	Coefficients
d1	-0.245 (0.831)
d2	1.631 (0.224)
d345678	0.125 (0.918)
Prod	-0.000 (0.591)
xintens	-3.019 (0.002)*
for2	0.196 (0.828)
size1	-2.514 (0.006)*
age1	-2.131 (0.023)**
Final	2.138 (0.011)**
Capintens	0.000 (0.282)
Exafr	0.476 (0.562)
Log likelihood	-33.457
Number of observations	155

Source: Author's elaboration based on RPED/GMES surveys
Notes: * and ** represent 1% and 5% significant levels respectively

The estimation result of the logistic model yielded statistical significance for the same variables- export intensity,

size, age, and final product export dummies as that of the complementary log-log model. Likewise, the estimates of the coefficient are very similar in the two cases as presented in Tables 2 and 4. This suggests that the estimates are quite robust to different assumption about the behaviour of the continuous hazards within intervals.

6. Conclusions and Recommendations

The paper has used an eight-year panel data to examine the impact of firm, industry and export destination characteristics on export survival Ghana's manufacturing exporters. In doing so, the survival analysis technique was used. The findings suggest the existence of negative duration dependence. The nature of the duration dependence reveals that the initial cost of entry that firms incur when they start exporting allows them to export for the first two years without incurring any updating costs, after which updating costs become prominent in the operations of these firms. The study further reveals that older firms survive longer in exporting than the younger ones.

Similarly, larger firms have lower hazards than smaller firms. Firms with higher export intensity are also shown to persist more in exporting than firms with lower export intensity. Firms that export final consumer products experienced higher hazards than firms that exported other products. The results show that firm productivity, capital intensity and foreign capital participation do not significantly influence export survival, likewise the proximity of the destination market.

The existence and nature of the negative duration dependence suggest the presence of learning-by-exporting effect for Ghanaian manufacturers. This implies that exporting could yield efficiency gains for Ghanaian manufacturers. Exporting will make Ghanaian manufacturers better manufacturers and this is likely to cause further growth of manufacturing exports and general improvement in the manufacturing sector's contribution to national output. Additionally, as Bigsten et al. (2004) admits, domestic markets in Africa are too small for manufactures and thus if countries such as Ghana are to industrialize, it has to be through

exporting. These make a good case for a policy that selectively promotes manufacturing exports. Any such policy should specifically focus on firms that have greater probability of success in foreign markets rather than just reducing entry costs generally, using the findings of this study, and others like it, as a guide. Firms could be given technical assistance in order to make them more internationally competitive.

In addition to the above, smaller exporters that manufacture similar products should be encouraged to form cooperatives, such that they operate in groups while maintaining their individual independence. In this case they pool their resources together, produce as a unit and then export either as a unit or individually. This will guarantee them benefits that larger firms enjoy, relating to the economies of scale, producing at minimum cost levels, meeting international quality standards and access to financing among others. They will, thus, be able to export on a larger scale and/or at lower per unit costs and achieve longer exporting stints.

Over time, they would grow and achieve greater efficiency levels individually. Finally, it has been shown that firms – after the first two years of exporting – incur updating cost in order to remain exporting. Thus, export infrastructure and accessibility of export information should be improved (as part of the technical assistance to exporters) in order to reduce the updating costs firms incur and at the same time guaranteeing firms the benefits that updating costs bring.

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