RESEARCH SERIES No. 83

PERFORMANCE AND SURVIVAL OF UGANDAN MANUFACTURING FIRMS IN THE CONTEXT OF THE EAST AFRICAN COMMUNITY

By:

FAISAL BUYINZA

SEPTEMBER 2011

RESEARCH SERIES No. 83

PERFORMANCE AND SURVIVAL OF UGANDAN MANUFACTURING FIRMS IN THE CONTEXT OF THE EAST AFRICAN COMMUNITY

FAISAL BUYINZA

SEPTEMBER 2011

The Economic Policy Research Centre (EPRC) is an autonomous not-for-profit organization established in 1993 with a mission to foster sustainable growth and development in Uganda through advancement of research –based knowledge and policy analysis.Since its inception, the Economic Policy Research Centre (EPRC) has made significant contributions to national and regional policy formulation and implementation in the Republic of Uganda and throughout East Africa. The Centre has also contributed to national and international development processes through intellectual policy discourse and capacity strengthening for policy analysis, design and management. The EPRC envisions itself as a Centre of excellence that is capable of maintaining a competitive edge in providing national leadership in intellectual economic policy discourse, through timely research-based contribution to policy processes.

Economic Policy Research Centre
Plot 51, Pool Road, Makerere University Campus
P.O. Box 7841, Kampala, Uganda
Tel: +256-414-541023/4
Fax: +256-414-541022
Email: eprc@eprc.or.ug
Web: www.eprc.or.ug

ABSTRACT

Using the most recent enterprise survey data of the World Bank(2006), this paper investigates the factors influencing firm performance and survival after the promulgation of the East African Community (EAC). The major findings of the paper include: (i)The EAC has adversely affected the survival of small and young firms; (ii) large manufacturing firms are consolidating their position in the EAC market by exploring the increased market size and information technology to increase their output and value added per worker; (iii) Exporters, especially to the advanced markets, have a higher chance of survival compared to the non-exporters. It was also evident that firm size, age, ownership, and business experience of the manager do significantly influence the firm's performance. Government policies should aim at improving the macroeconomic environment in which manufacturing firms operate so as to reap the benefits of the EAC and increase the chances of firm survival. Specifically, there is need for government policy to create more industrial parks, solve the problem of electricity power outages, and encourage the penetration of information technology across the country.

Key words

Manufacturing firms, survival, performance, East African Community (EAC)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

The international political-legal environment has been changing with increasing globalization and regional integration. Levitt (1983) defines globalization as increasing interdependencies among world markets whereas Stigliz (2002) defines it as the removal of barriers to free trade and the closer integration of national economies. Thus, globalization implies worldwide accessibility by firms to the same markets and the same, thus increasing competition across borders. The General Agreement on Tariffs and Trade (GATT), which was first signed in 1947, and its successor, the World Trade Organization (WTO), which was established on January 1st, 1995, have contributed to globalization through lowering barriers to cross border trade.

In parallel to globalization, regional market integration refers to the cross border integration of national production, exchange, and financial markets at a regional level with free flow of goods, services, labour markets, along with the shift of policy-making power from home governments of member countries to supranational regulation organizations.

These changes in international political-legal environments have created challenges for firms and affected their operations (Tuulenman and Virtanem 1990). A challenge is a development that may be threatening, proactive, stimulating or inciting. From this perspective, regional integration may be a threat or an opportunity to the performance and survival of manufacturing firms. The opportunity of regional market integration may include reduced cost to adapt to each market separately, increased cooperation with regional partners, ease of access to a larger market, and consequently economies of scale and increased profit margins (Cecichemi 1988). The eased entry of competitive international players in home markets, on the other hand, may be a threat, arising from the fact that firms in the same industry compete for similar limited resources and markets (Pfeffer and Salancik 1978). Hence, the increased competition may result in reduced profit margins and closure of the least efficient firms, and make smaller firms vulnerable to take-overs (Mirola 2006; Levy 2007).

Once firms have entered the market, they operate under continuous but varying levels of exit risk. Theoretical models of industrial evolution such as the passive learning model of Jovanovic (1982) and the active learning model of Pakes and Ericson (1998) predict that small firms are more likely to exit the market than their large counterparts. These models also predict that the risk of business failure declines over time as firms acquire new competitive skills or as they fully discover their innate efficiencies. However, Porter (1990) notes that the business strategies literature suggests that small firms do not need to grow in size in order to survive. The argument is that small firms have the advantages of flexibility and specialization in niche markets that allow them to overcome business failures. In addition, a number of authors note that factor intensity is often used as an indicator of firms' choice of technology. Standard trade theory claims that capital-intensive industries in economies abundantly endowed with labour would contract or even disappear unless they are protected. However, more capital per person could enhance labour productivity and reduce the hazard of business failure. The latter is a view adopted by theories of industrial development that relate firm survival and growth to investment in productivity-enhancing activities (Pakes and Ericsson 1998). Firms' choice of skill intensity may also affect their prospects of success. This could in fact be more relevant than capital intensity particularly for technologically advanced products that require continuous upgrading.

The application of the above theoretical arguments in the context of the East African Community (EAC) is not doubted and hence the special interest into drawing insights on its effect on the performance and survival of manufacturing firms in the EAC. The treaty establishing the current EAC was signed on 30th November 1999 and came into force on 7thJuly 2001 upon its ratification by the Republics of Kenya, Uganda, and Tanzania. The main objective of the current EAC is to promote cooperation in "political, economic, and social fields." It envisages deepening regional integration by establishing a Customs Union (CU), Common Market, a Monetary Union and, ultimately a Political Federation among the partner countries (Article 5.2: EAC Treaty, 2001). This paper focuses on the impact of the EAC on the performance and survival of Uganda's manufacturing firms.The paper places special interest in the key aspects exposed by the theoretical arguments above; the probable opportunity or threat of the EAC on manufacturing firms. It attempts to answer the following pertinent questions within the EAC environment: Do exporting firms have an edge over non-exporters for survival? Are exporters to advanced markets more likely to survive compared to exporters to sub-Saharan African market? Does the size and age of the firm matter?

The rest of the paper is organized as follows. Section 2 exposes both the theoretical and empirical literature while section 3 discusses methodological issues, including data sources. Empirical results are presented and discussed in Section 4 prior to conclusions in Section 5.

2. LITERATURE REVIEW

The body of literature, both theoretical and empirical, analyzing the survival and performance of manufacturing firms has substantially grown.The theory on industrial organization suggests that firm size and age play a crucial role in the survival of firms. In general, experience and size increase survival probability over the lifecycle of a firm (Jovanic,1982and Pakes and Ericson,1998). In addition, researchers (such as Dunne et al. 1988; Mata and Portugal 1994; Audretsch 1995;Tveteras and Eide 2000) note that new firms are supposed to be more at risk after entry and only a few of them are able to survive the critical start-up period, particularly in technology intensive environments. Moreover, new firms lack sufficient resources and stable relationships and networks among suppliers and distributors. Empirical studies found evidence for the hypothesis of 'liability of newness' (Freeman et al. 1983; Honjo 2000) as well as the 'liability of adolescence' (Strotmann 2007) where the risk of failure declines with firm age. Some studies examine the link between survival and the current size of firms (Evans 1987; Hall 1987 and Domset al. 1995). Most of the studies found that large firms have a greater chance of survival after entry due to their larger scale of production (Mata et al. 1995; Klepper and Simons 2000). Some other studies find no link between start-up size and survival (Audretschet al. 1999).

Further, technology is another factor aiding survival of firms. In his study, Hall (1987) notes that the growth and survival of US manufacturing firms depended more on R&D expenditure than capital investment. Hall argues that the R&D activities result in knowledge stock that increases the market value of the firm and its probability of survival. Also Domset al. (1995) examine the role of technology in the growth and survival of US manufacturing plants. They demonstrate that plants using more capital and advanced technologies have higher growth rates and have a greater probability of survival. Similarly, Colombo and Delmastro (2001) show that firms that adopt a range of advanced manufacturing technologies have higher chances of survival. In fact, Agarwal and Audretsch (2001) found that small size may not adversely affect survival in mature and technologically intensive industries since the relationship between firm size and survival is also dependent on technology and the stage of the product cycle. Besides size, age and innovation, some studies also consider ownership as a factor affecting the survival chances of firms (Mata and Portugal 2002). The literature review has informed our choice of the variables to be included in theanalysis and exposed the fact that whereas a number of studies have been conducted on the survival and performance of manufacturing firms, no study has addressedthe issue with a special focus on the EAC.The findings of this paper therefore represent a real value added to the existing literature and policy.

3. METHODOLOGY

The methodological approach employed in the analyses for the determinants of firm performance and survival is the subject of this section. To test whether firms with different characteristics exhibit different performance and survival in the EAC for the manufacturing industry, the paper adopted two distinct but interdependent approaches. The ordinary least square is employed to estimate the factors influencing firm performance. The Cox Hazard model and the Kaplan-Meier survival functions are employed to analyse the factors influencing firm survival within the EAC.

Following Bigstenet al. (2000), a conventional Cobb-Douglas production function is specified as expressed in Eq. (1) to investigate the factors influencing firm performance:

(1)

$$Y_{ij} = A_j K_j^{\alpha} L_j^{\beta}$$

From Eq. (1), A_{ij} is the i^{th} firm productivity in the j^{th} country, L_{ij} and K_{ij} are stocks of the i^{th} firm labour and capital in the j^{th} country respectively. Eq.(1) could also be written in per worker terms also called the intensive form (or the AK model in Barro and Sala-i-Martin 2004).

(2)

$$y_{ij} = A_j k_j^{\alpha}$$

From Eq.(2), Y_{ij} is the i^{th} firm's output or value added per worker (our measure of productivity) in the j^{th} country; and K_i is the i^{th} firm capital intensity (capital per worker) in the j^{th} county. This follows Grossman and Helpman (1991) argument that exporting leads to knowledge and technological spillovers, and that A_{ij} is influenced by a firm's export status as well as export destinations.

(3)

$$A_{ij} = f(X_j, Dev_j, Und_j, Z_j)$$

From Eq.(3) X_{ij} is a dummy variable for the i^{th} firm export status in the j^{th} country; equal to one if the firm is an exporter zero otherwise. Dev_i is a dummy variable equal to one if the firm is an exporter in advanced markets and zero otherwise. Und_i is a dummy variable equal to one if the firm is an exporter in a less advanced market and zero otherwise. Z_{ij} is a vector of firm-specific characteristics (control variables) including ownership, age, location, and industry, source of finance at start-up and capacity utilization, among others. Firmage is included to capture the possibility that young firms may initially go through a strenuous spell before they can cope with the market conditions at which phase they operate at their fullest capacity. On the other hand, the quadratic term for age is included to capture the possibility that timeworn firms may be using obsolete technology in which case their efficiency gains may shrink. Eq. (3) can be re-written as in Eq. (4) after imposing a multiplicative relation on the right hand side elements.

(4)

$$A_{ij} = X_j^{\lambda}\ Dev_j^{\phi} Und_j^{\eta}\ Z_j^{\gamma}$$

Substituting Eq.(4) for the productivity parameter in Eq.(2) gives:

(5)

$$y_{ij} = X_j^{\lambda}\ Dev_j^{\phi} Und_j^{\eta}\ Z_i^{\gamma}\ k_j^{\alpha}$$

Taking natural logs on both sides of Eq.(5) gives an estimable linear function:

(6)

$$\ln\ y_{ij} = \delta + \lambda \ln\ X_j + \phi \ln\ Dev_j + Und_j + \gamma \ln\ Z_j + \alpha \ln\ k_j + \varepsilon_j$$

From Eq.(6), ε_{ij} is a random disturbance term assumed to be distributed identically and independently across firms. It represents factors such as luck, weather conditions and unpredicted variations in inputs. Eq. (6) is estimated using simple OLS.

The Cox Proportional Hazards Model was used to estimate survival of firms. This technique is widely used in the contemporary literature in the analysis of durations. The greatest virtue of this method is that it adjusts for truncation bias given the fact that the data set mightcontain both firms that have exited and those that are still continuing by the time the survey was conducted. The hazard rate for failure at time *t* is defined as the rate of failures at time *t* among those who have survived to time *t*. The hazard rate is modelled as a function of the baseline hazard (h_0) at time *t*, and the effects of one or more *x* variables (Hamilton 2009; pp. 317) as expressed in Eq. (7).

(7)

$$h(t) = h_0(t)\exp(\beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k)$$

Baseline hazard means the hazard for an observation with all *x* variables equal to zero. Cox regression estimates this hazard rate non-parametrically and obtains maximum-likelihood estimates of the β parameters.

4. DATA SOURCES

4.1 Description of the data

The paper employs a comprehensive World Enterprise Survey data on 1,532 manufacturing firms conducted by World Bank in 2006. The population of industries that were included in the Enterprise Survey includes all manufacturing sectors, construction, services, transport, storage, and communications. In order to keep only formal enterprises, the survey sample frame includes only establishments with five (5) or more employees. Fully government owned firms are excluded as the universe is defined as the non-agricultural private sector. The Enterprise Survey is stratified following 3 criteria: sector of activity, firm size, and geographical location. Whereby stratification by firm size divides the population of firms into 3 strata: small firms (5-19 employees), medium firms (20-99 employees), and large firms (100 or more employees). Geographical distribution is defined to reflect the distribution of the non-agricultural economic activity of each country. The survey sample size consituted 307, 781, 102, 59 and 273 for Uganda, Kenya, Rwanda, Burundi and Tanzania respectively. The surveyed firms are both exporting and non exporting firms.

The data contains information on firm characteristics such as: export status, export destinations, output level, sales (domestic and foreign), raw materials, and experience and education attainment of the manager, ownership, location, source of start-up finance, industry, firm age (year of start-up), raw materials by source (domestic and imported), labour force (by skill and gender), and capital stock among others. Uganda's and the other members of the EAC export networking is mainly on two levels: first, they participate heavily within the regional trading arena- the EAC taking advantage of the existing trading agreements; second,trading with advanced trading partners, e.g., the United States of America (USA) and the European Union (EU) as main destinations of their exports. The data provided information considered relevant for exploring the performance differential between exporters and non-exporting manufacturing firms in the EAC. Output per worker and value added per worker are used as proxies for productivity. For the level of development of the trading arena, a variable of whether a country exports to an advanced (less advanced) market or not was generated. The data set also provides information on the share of the country's exports going to member countries, developed and less developed countries.

The survival of firms was analysed on the basis of firm's life span. If a firm was *n* years old in any given year t, then that observation was taken as the average of the observations in *t*-1 and *t*+1 time periods. However, if a firm started operation in any given year, then that firm was included in the sample. Following the procedure in most survival studies, the definition of survival involves continuous operation.

4.2 Description of Model Variables

Individual firm manager's characteristics: The paper used eight control variables that were found to be related to firm performance. The survey gathered information on the manager's years of experience and education – the two decision-maker-related variables. The variables entered the model among the control variables as the most important factors that determine firm performance and survival probabilities. Bruderlet al. (1992) and Klepper(2002) argue that firms managed by well educated and experienced managers have high chances of success than those run by their counterparts with lower education and business experience. Manager's prior experience with foreign owned firms is included as an addition covariate in analyzing the determinants of survival of Ugandan manufacturing firms.

Firm level characteristics (Z_{ij}): The firm age variableis used to capture the firm's experience. The log of age is used as a proxy for experience. Like firm size, firm age is another initial condition which has been found to shape survival probability of firms. The age of the firms is calculated as date of starting operations in the industry. Age 0 identifies those firms that entered during 2005. It is a time-varying covariate measured as the difference between the current year and the incorporation year for a given firm. The square term of age is included in the model following Evans (1987) and Bruderl and Schuster (1990) that the link between age and survival may follow an inverted-U. In addition, an interaction tem between the firm age and size is included since interaction might shape firm survival.

In the model, firm size is controlled for as one of the starting conditions and two proxies were used.Current firm size is included following Evan (1987) and Hall (1987).First, firm size is measured by the number of employees categorized into small (5-19 employees), medium (20-99 employees) and large (100 and more employees) firms. The alternative measure of firm size is expressed in logarithm of sales. Size is a time-varying covariate to account for the ability to learn after entry. The paper hypothesizes that small firms are more exposed to the risk of exit than large firms.

Firm ownership status is also included in the model as one of the determinants of firm performance in the EAC. The variable takes the value 1 if a firm is an affiliate of a foreign firm and 0 otherwise when is domestically owned by Ugandans. The foreign owned manufacturing firms are hypothesised to be more active in forging alliances through M&As under the influence of the merger wave that swept the global trading arena than locally owned manufacturing firms.

Export status (X_{ij}): Furthermore, export status of the firm is another key determinant factor of firm performance. Two proxies were constructed. First, firms that did not export any of their products outside the home country were classified as non-exporting firms. A dummy variable is used to indicate a firm's export status where the dummy takes the value 1 in the year a firm starts to export directly and zero otherwise. Second, dummies for export destinations were constructed: developed market = 1 if a firm exported to an advanced marked and =0 otherwise; and undeveloped market=1 if a firm is an exporter to an export to SSA market and =0 otherwise.

The number of customs days taken by a firm to clear her exports at the customs for foreign markets is a key determinant factor of a firm export performance in an export market.The paper hypothesizes that the 'intervention' in the form of an amendment to the existing labour regulations and tariff are policy changes towards a less stricter trade regime and have favourably affected the performance and survival of Ugandan manufacturing firms and firms in the EAC since the option of becoming exporters within EAC member countries is much more easier as tariffs no longer apply for exports within the EAC.

Firm performance (Y_j):This study employs firm sales and value added per worker as measures of firm performance-sales and value added per worker. The performance variables are calculated for all the manufacturing firms that responded to the World Bank Enterprise Survey (2006).

Firm survival proxies (***h***): Firm age is used to examine firm survival in the context of the EAC since the time it started operation. The analysis is thus not limited to new firms or selected cohorts of entrants, but extended to all firms of varying ages and sizes (Evans, 1987; Hall, 1987). The survival is therefore the period which the firms have spent in the market up to 2005. This event is defined with respect to the entire

population of manufacturing firms in the five countries- Uganda, Tanzania, Rwanda, Kenya and Burundi of East African Community. The survival time is censored on the right of 2005, as an exit event is not observed beyond this period.

In addition, survival of the firm, which is a duration variable is examined using the Cox proportional hazards model. The information on firms that survive was used to conduct event history analysis, the event being exit of a firm. The Cox proportional hazards model specifies the survival function that describes the probability of a firm's survival until a certain time has elapsed. To assess the probability of firm survival, a non-parametric analysis of the determinants of firm survival was undertaken. The Cox model does not impose any functional form on the distribution of survival times. However, it assumes a parametric form for the effects of the covariates on the hazard rate and the hazard proportionality assumption that the proportion oftwo kinds of hazard is constant and independent of the survival time. According to Bain (1969), survival is the only test of the ability of a firm to cope with problems such as buying inputs, finding customers, introducing new products and techniques and so on in a competitive environment. Hence, efficiency is defined as survival-ability.

5. RESULTS

In this section, the results for the determinants of manufacturing firm performance and survival in the EAC is presented. The descriptive results are presented prior to findings based on econometric analysis.

5.1 Descriptive results

The general characteristics of the Ugandan manufacturing firms and those of the other trading partners in EACare presented in Table 1 and Table 2. These results provide insights on the effect of the EAC on firm performance by analyzing the average change in sales and prices between 2002 and 2005.

5.1.1 Changes in sales and prices

Overall, at aggregate level all manufacturing firms experienced a positive average change in sales of 37 percent. However, at disaggregated level, there are firms that experienced negative changes in sales over the review period. This finding might imply that the establishment of the EAC had both positive and negative impacts on manufacturing firms. There are notable variations across countries. Firms in Tanzania registered the highest percentage change in sales, on average, 107 percent,followed by Uganda with 29.2percent, Rwanda with 25.2 percent, Burundi with 10 percent and Kenya with 3.0percent (Table 1). However, looking at the minimum values, Kenya experienced the greatestnegative change in sales during the review period (Table 2).

Turning to firms engaged in exports, the results suggest that all firms experienced a positive percentage change in export values of 62.3percent, on average. Table 1 shows that for exporting firms, Tanzanian firms lead all other firms in the percentage change in sales (316 percent) and Ugandan firms come last with 23 percent. It is noteworthy that the relatively high changes in the export value for Tanzania and Burundi cannot be attributed to the emergence of new firms as the number of exporting firms remained the same. On the other hand, the rest of the countries seem to have experienced positive change in export values partly due to slight increase in the number of exporting firms. Kenya registered three additional firms, Uganda and Rwanda one firm. In case of Tanzania and Burundi, there are two possible explanations for this phenomenon. First, the existing firms might have responded to the increase in the market size by investing more in the same line of product or other new lines. Second, the existing firms that were operating at excess capacity due to market constraints might have responded by fully utilizing their potential with the ease of access to the bigger EAC market.

Table 1: Changes in sales of manufacturing firms, 2002-2005 (mill. US$)

Country	Sales			Firms	
	2002	2005	%change in sales	2002	2005
All firms (sales value)					
All countries	106.6	145.7	36.6	1243	1522
Kenya	557.6	574.2	3.0	579	781
Burundi	26.2	28.7	10.0	89	102
Rwanda	193.9	242.9	25.2	46	59
Tanzania	124.6	258.0	107.0	249	273
Uganda	108.7	140.3	29.2	280	307
Exporting firms (Export values)					
All countries	101.5	164.7	62.3	238	243
Kenya	221.9	229.6	32.5	154	157
Burundi	48.6	76.3	57.0	2	2
Rwanda	171.8	226.6	32.4	10	11
Tanzania	67.3	281.9	315.8	35	35
Uganda	240.8	295.9	22.9	37	38

Source: *Author's own calculations from enterprise survey data sets of the World Bank (2006)*

Table 2: Mean sales and export values for manufacturing firms, 2002-2005 (mill. US$)

Country	Mean	Minimum	Maximum	Number of firms
All firms:				
All countries	683.1	-2,734.4	13,830.5	1,243
Kenya	212.2	-15,533.8	29,958.0	579
Burundi	5.0	-145.8	162.3	89
Rwanda	110.2	-139.2	1,595.0	46
Tanzania	155.8	-607.1	10,464.1	249
Uganda	38.6	-1,414.1	4,548	280
Exporting firms:				
All countries	252.3	-2,734.4	13,830.5	238
Kenya	177.5	-15,533.7	8,321.7	154
Burundi	100.1	50.0	151.7	2
Rwanda	273.7	1.9	1,595.0	10
Tanzania	846.7	-159.8	10,464.1	35
Uganda	237.0	-1,414.1	4,548.2	37

Source: Author's own calculations from enterprise survey data sets of the World Bank (2006)

Table 3 presents the share of firms that reported having experienced a change in sales and price over the period 2002 and 2005. Considering the entire sample, firms that reported an increase in sales, 78.3 percent were non-exporting firms, whereas those that reported no changes in sales nearly 83 percent were non-exporting firms. The results based on changes in prices do yield similar results. These findings are mirrored at country level. It is evident from these findings that the changes in sales during the period were drivenby non-exporting firms.

Table 3: Percentage of firms that experienced changes in sales and price

Country/Change	Sales		Price	
	Non-exporters	Exporters	Non-exporters	Exporters
All firms:				
Increased	78.3	21.7	81.4	18.7
Remained the same	82.8	17.2	78.7	21.4
Decreased	82.4	17.6	70.0	30.0
Total	79.7	20.3	79.7	20.3
Kenya				
Increased	63.3	36.7	67.7	32.4
Remained the same	68.5	31.5	59.0	41.08
Decreased	58.5	41.5	50.0	50.0
Total	63.4	36.6	63.4	36.6
Burundi:				
Increased	97.1	2.9	100.0	0.0
Remained the same	100.0	0.0	96.3	3.7
Decreased	100.0	0.0	85.7	14.3
Total	98.0	2.0	98.0	2.0
Rwanda:				
Increased	79.5	20.5	87.2	12.8
Remained the same	77.8	22.2	70.0	30.0
Decreased	90.9	9.1		
Total	81.4	18.6	81.4	18.6
Tanzania:				
Increased	85.3	14.7	84.5	15.5
Remained the same	90.0	10.0	95.0	5.0
Decreased	96.4	3.6	94.1	5.9
Total	87.1	12.9	87.5	12.6
Uganda:				
Increased	87.2	12.8	87.9	12.1
Remained the same	90.2	9.8	88.5	11.5
Decreased	86.8	13.2	80.0	20.0
Total	87.6	12.4	87.6	12.4

Source: Author's own calculations from enterprise survey data sets of the World Bank (2006)

Considering a change in price, Ugandan firms that reported an increase in price, 87.9 percent were non-exporting firms and 12.1percent were exporters. For Ugandan firms that reported a no change in price, 88.5 percent were non-exporters and 11.5 percent were exporters, while firms that reported a decrease in price, 80 percent were non-exporters and 20 percent were exporters. A similar picture can be observed for other countries.

5.1.2 Firm's export intensity

The export intensity,computed as a ratio of the total industry over the total manufacturing export is used a measure of a firm's ability and effort to gain a bigger share in the regional market. The results are presented in Table 4. Export density is highest in machinery and equipment at an average of 5.6 percent, being driven by firms in Tanzania. This is followed by the non-metallic furniture at 2.8 percent with Uganda leading the rest of the countries in EAC. Broadly speaking, Uganda is leading the rest of the EAC countries in chemicals exports with an average intensity of 6.8 percent well above 1.4 percent of all firms in the region. Turning to export intensity by firm size, the results in Table 4 reveal that the export intensity increases with firm size with the exception of firms in Rwanda. In Rwanda, small firms seem to have a higher intensity compared to the medium firms.

Table 4: Export intensity of manufacturing firms by industry and firm size (Percentage)

Industry	All countries		Kenya		Burundi		Rwanda		Tanzania		Uganda	
	Mean	Max	Mean	Max	Mean	Max	Mean	Max	Mean	Max	Mean	Max
By Sector:												
Food	0.3	27.7	-	1.3	-	-	0.3	4.5	0.6	27.7	0.5	17.5
Garments and textiles	0.5	16.6	0.8	16.6	-	-	0.2	1.4	0.1	4.7	-	0.3
Machinery & equipment	5.6	62.2	1.4	4.1	-	-	0.0	0.0	19.3	62.2	2.0	9.7
Chemicals	1.4	28.2	1.3	7.7	0.5	5.4	0.6	3.8	0.0	0.0	6.8	28.2
Electronics	-	-	-	-	-	-	-	-	-	-	-	-
Non-metallic furniture	2.8	53.5	3.0	27.9	-	-	-	-	-	-	4.8	53.5
Wood product furniture	0.4	42.7	0.4	12.8	-	-	-	-	1.2	42.7	0.1	6.8
Metal products	0.8	51.7	0.3	7.0	-	-	-	-	1.1	24.8	1.1	51.7
Other manufacturing	0.6	0.3	0.1	1.8	0.1	1.7	-	0.4	0.4	9.1	2.0	61.2
By firm size												
Small	-	10.3	-	1.5	-	-	0.1	1.2	-	0.4	0.1	10.3
Medium	0.3	15.6	0.2	5.6	0.3	5.4	-	0.4	0.4	14.9	0.6	15.6
Large	3.5	62.2	2.1	50.7	0.4	1.7	0.9	4.5	5.9	62.2	9.5	61.2

5.1.3 Firm's performance

Considering the performance of firms during the review period, the results in Table 5 suggest that small firms out perform the larger ones.

Table 5: Performance of manufacturing forms by firm size, 2006

Variable	Small	Medium	Large
All firms:			
Output per worker	8,749.4	2,419.4	2,248.7
Value added per worker	5,030.0	1,383.1	1,087.4
Capital intensity	42.00	1,074.0	965.6
Output per capital unit	-3.23	-0.9	0.1
Value added per capital	-2.54	0.1	0.1
Value added ratio	0.6	0.6	0.5
Capacity utilisation (%)	70.9	69.8	75.5
Age, years	10.6	17.4	24.4
Foreign ownership, %	7.0	20.0	26.0
Female (%)	1.7	1.7	1.8
Export status	0.1	0.2	0.6

Source: Author's own calculations from enterprise survey data sets of the World Bank (2006)

For all the countries in the sample, small firms have the highest output per worker and value added per worker, while the medium firms have the highest capital intensity compared to the large. This could be attributed to the fact that small and medium firms are easy to manage and they are more likely to use domestically sourced raw materials and equipments compared to the large firms. Yet, small firms survive with the constraint of finances and skilled workers. Looking at the value added ratio, which computed is the ratio of the firm's value added to total production, there is no significant difference between small and medium firms (Table 5). This is an important measure as far as the EAC market is concerned because a firm with the highest manufacturing valued added per worker is better positioned to benefit from Regional Economic Integration. The small and medium firms have a higher value addition ration relative to large firms, implying that the former have a greater potential than the latter to benefit from the EAC. On the other hand, large firms have a higher capacity intensity relative to small/medium firms. It is evident that large firms have the highest of 76 percent, followed by small firms with 71 percent and medium firms with 70 percent (Table 5). As expected, there is a positive association between the firm size and its life cycle. The large firms were older with an average age of 24.4 years, followed by medium firms with 17.4 years and small firms with 11 years. This may imply that it takes time for firms to develop from small to large firms. Looking at ownership, there was a large share of big firms owned by foreigners (26 percent), followed by medium firms (20percent) and small firms (7percent). In the same line of argument, 60 percent of larger firms are exporters compared to 20 percent of medium firms and only 10percent of small firms.

Table 6 presents the performance indicators of manufacturing firms in the EAC by their export status. At aggregated level, the results reveal that exporting firms are more productive than non-exporting firms considering all firms in the region. This is true regardless of performance measure.

It is also noted that exporting firms are two times older than non-exporting firms, which means that penetrating into a foreign market is a function of time as it involves learning. There is a greater share of exporting firms that are owned by foreigners (28 percent) compared to non-exporting firms (10 percent). However, it is worth noting that there is no significant difference between non-exporters and exporters looking at the value added per worker measure –estimated at about 60 percent in both cases. This implies that the non-exporting firms are likely to benefit from the regional integration due to a high ability to penetrate the market.

However, the disaggregated analysis reveals notable differences between countries. The non-exporting firms in Kenya have a higher output per worker, capacity utilization, value added ratio and capital intensity compared to their counterparts engaged in exporting business. On the other hand, Kenyan exporters have a higher value added per worker, average product of capital, value added per capital unit. Taking the entire EAC region, Kenyan exporters have been in the business longer than those in the rest of other EAC countries; and have higher share of exporting firms owned by foreigners -nearly 22 percent compared to 8 percent of non-exporters. There are also remarkable differences in the use of websites between Kenyan exporters (39 percent) and non-exporters (7 percent). The same applies to overdraft facilities, with 73 percent of exporters compared to 26 percent non-exporters. There are also more exporting firms in the industrial processing zone (66 percent) compared to 38 percent of non-exporters. Exporters also have more years of managerial experience of 17 years compared to only 10 years for non-exporters. Kenyan exporters have 6 days of customs clearance.

For the case of Tanzania, exporters have a higher output per worker, value added per worker, output per capital unit compared to non-exporters. On the other hand, non-exporters posted a higher value added ratio of 67 percent compared to 62 percent of exporters, higher capacity utilization 73.4 percent compared to 70 percent of exporters (Table 6). However, exporting firms are also twice older compared to non-exporters and there is a higher share of exporting firms owned by foreigners with 34 percent compared to 10 percent of non-exporters (Table 6). Also there are remarkable differences in the use of website between Tanzanian exporters and non-exporters. There is a higher share of exporters operating websites (43 percent) compared to only 12 percent of non-exporters. The same applies to overdraft facilities, with 49 percent of exporters compared to 17 percent non-exporters. There are also more exporting firms in the industrial processing zone (51 percent) compared to 41 percent of non-exporters. In Tanzania, the years of managerial experience between exporting firms and non-exporters is 14 and 13 years respectively, while firms take on average 5.8 days of customs clearance.

Table 6: Performance of manufacturing firms by export status

Variable	Non- Exporter	Exporter	Non-Exporter	Exporter	Non-exporter	Exporter	Non-exporter	Exporter	Non-exporter	Exporter	Non-Exporter	Exporter
	All firms		Kenya		Burundi		Rwanda		Tanzania		Uganda	
Output per worker	1,055,766	3,568,488	53,840	49,960	6,463	2,751,099	17,506	5,763,898	1,565,620	5,383,817	906,361	698,881
Value added per worker	5,878	1,858,147,34	17,522	26,590	3,348	1,351,246	8,194	3,262,584	990,494	3,051,362	4,563	3,483,483
Capital intensity	544	1,455	1,503	1,355	341	794	1,179	581,380	868	4,076	2,331	1,275
Output per capital unit	-2.6	1.1	2.2	4.8	141.3	0.0	-25.7	0.0	-5.9	0.1	0.1	2.6
Value added per capital	0.0	0.9	1.3	2.9	0.1	0.0	-7.7	0.0	-4.6	0.1	0.1	2.3
Value added ratio	0.61	0.56	0.60	0.56	0.68	0.49	0.51	0.49	0.67	0.62	0.58	0.50
Capacity utilisation	71.3	71.4	73.0	72.9	65.8	60.0	67.8	64.1	73.4	69.9	70.6	70.1
Age, years	12.39	23.82	12.53	25.34	11.77	25.00	11.81	19.82	13.28	20.97	11.64	21.24
Foreign ownership (%)	10.0	28.0	8.0	22.0	21.0	50.0	13.0	27.0	10.0	34.0	13.0	47.0
Website use (%)	8	41	7	39	7	0	8	64	12	43	6	41
Overdraft (%)	21	65	26	73	29	1	33	91	17	49	9	40
Export processing zones (%)	33	62	38	66	19	1	19	46	41	51	29	63
Managerial experience (%)	10.7	16.1	10	17	10.1	12	12	15.5	13	14	10	16
Customs days	0	5.8	0	6	0	1	0	5.9	0	5.8	0	5.3
Female ownership %	1.69	1.72	1.61	1.71	1.74	1.50	1.62	1.60	1.80	1.79	1.76	1.74

Source: Author's calculations based on the Enterprise Survey data of the World Bank, 2006

With regards to the Ugandan manufacturing firms,non-exporters have a higher output per worker and capital intensity, while exporter have a higher value added per worker, output per capital unit, and value added per capital unit. On the other hand, non-exporters have a higher value added ratio and a higher capacity utilization. However, exporting firms are also twice older compared to non-exporters and there is a higher share of exporting firms owned by foreigners with 47 percent compared to 13 percent of non-exporters. Also there are remarkable differences in the use of website between Ugandan manufacturing exporters and non-exporters. There is a higher share of exporters operating websites (41 percent) compared to only 6 percent of non-exporters. The same applies to overdraft facilities, with 40 percent of exporters compared to 9 percentnon-exporters. There are also more exporting firms in industrial processing zone (63 percent) compared to 29 percent of non-exporters. In Uganda, the years of managerial experience of exporters and non-exporters is 16 and 10 years respectively, while firms take on average 5.3 days of customs clearance. From the summary of the performance indicators, a number of differences can be seen across the three countries, which imply that firms in the region are likely to benefit differently from the EAC. Overall exporters have a performance edge over the non-exporters and are managed by more experienced managers, have easy access to finance and have a higher productivity.

5.1.4 Firm's survival

The Kaplan-Meier survival functions are employed to estimate the probability of manufacturing firms' survival in the three countries Uganda, Kenya and Tanzania by firm size (Figure 1), export status (Figure 2), and market destination (Figure 3).Figure 1(a) reveals that large Kenyan firms have a higher probability of survival compared to small or medium firms. The distance between survival function for large and small firms is quite large compared to the distance between large and medium firms. But also, the distance between the survival function for small and medium firms is noted to be wide up the age of 30 years beyond which there are minor differences across the three types of firms.The figure shows that for the small and medium firms the failure rate is larger at the up to almost ten years as compared to large firms. The pattern of failure for large and medium firms is almost similar after the age of ten years.

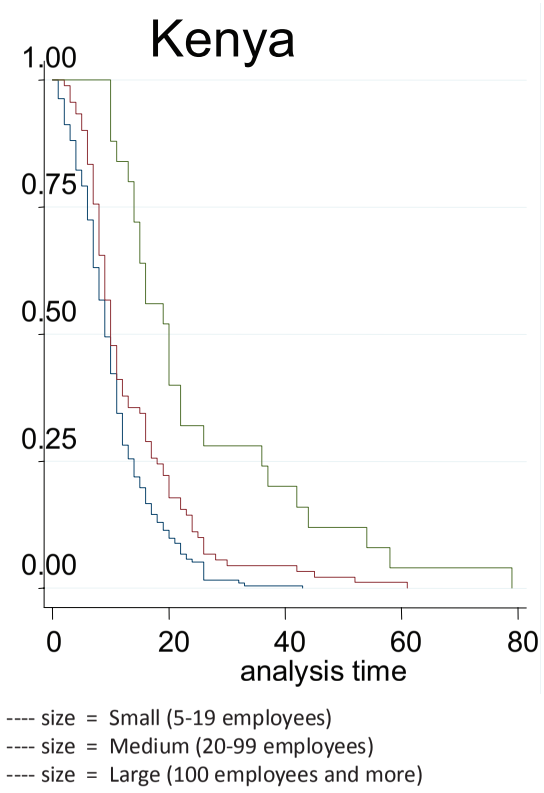
It is evident from Figure 1(b) that the large Ugandan firms have a higher probability of survival compared to small and medium firms. The distance between survival function for large firms and small firms is quite large compared to the distance between large and medium firms as firm age increases. However, after the age of 10 years, small manufacturing firm have a higher survival probability than medium firms as the small firms' survival function lies above that for the medium firms. For the large and medium firms the failure rate is notably larger after the age of thirty years as compared to large firms. The pattern of failure for large and medium firms is almost similar after the age of thirty years.

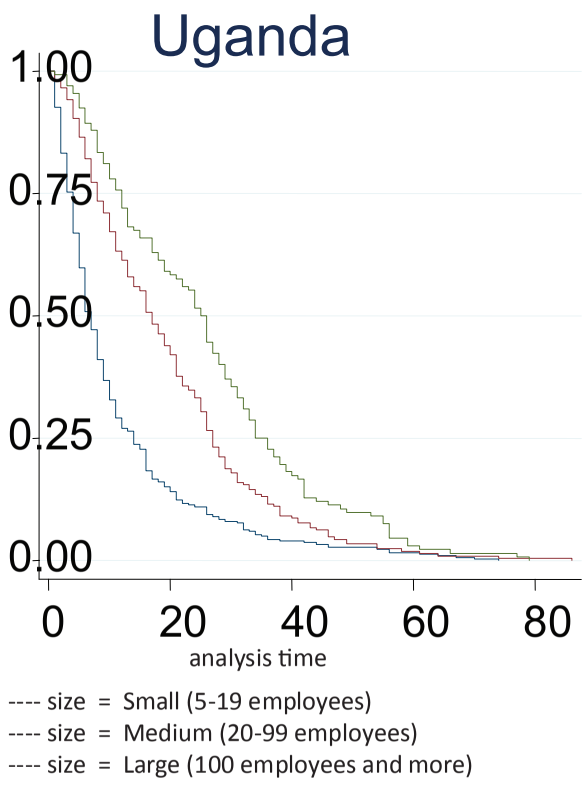
Figure 1(c) reveals that large Tanzanian manufacturing firms have a higher probability of survival compared to small and medium firms. However, the distance between survival function for large, medium firms and small firms is not quite large and after the age of thirty years, all Tanzanian manufacturing firms depict a uniform probability of survival. But also, the distance between the survival function for small and medium firms is noted to be wide up the age of 30 years beyond which there are minor differences across the three types of firms. For smaller and medium firms the failure rate is notably larger at the up to almost ten years as compared to large firms. The pattern of failure for large and medium firms is almost similar after the age of ten years.

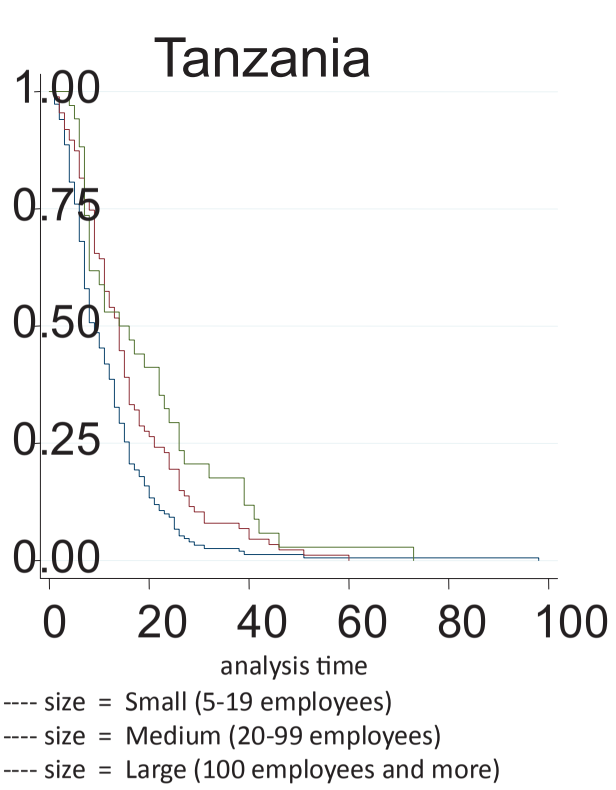
Figure 2 presents the survival functions of manufacturing firms in the three EAC countries with focus on both the exporters and non-exporters. As expected, the exporting manufacturing firms

have a higher probability of survival in the three countries. Figure 3 presents the survival functions of manufacturing firms in the three EAC countries with focus on both exporters and non-exporters in regards to the market destinations for the firm products. As expected, thefirms exporting have a higher probability of survival in the three countries compared to the non-exporters. Note that Ugandan exporting firms show a higher survival probability compared to the non-exporters. The main policy implication of these findings is that with increase in the market size, exporting firms are likely to benefit more than the non-exporters and overall, the countries are bound to benefit from the efforts of economic integration.

Figure 1: Probability of manufacturing firms' survival in EAC by size







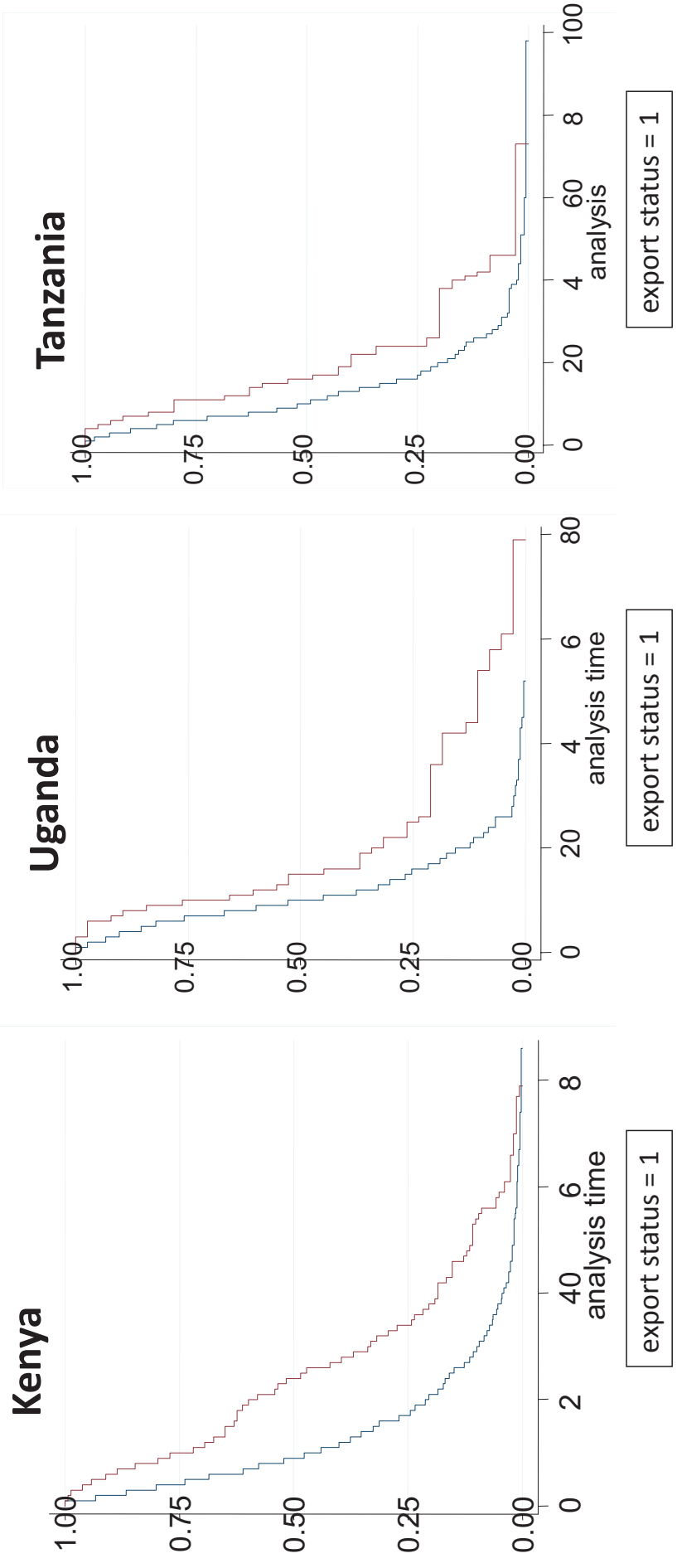


Figure 2: Probability of manufacturing firms' survival in EAC by export status

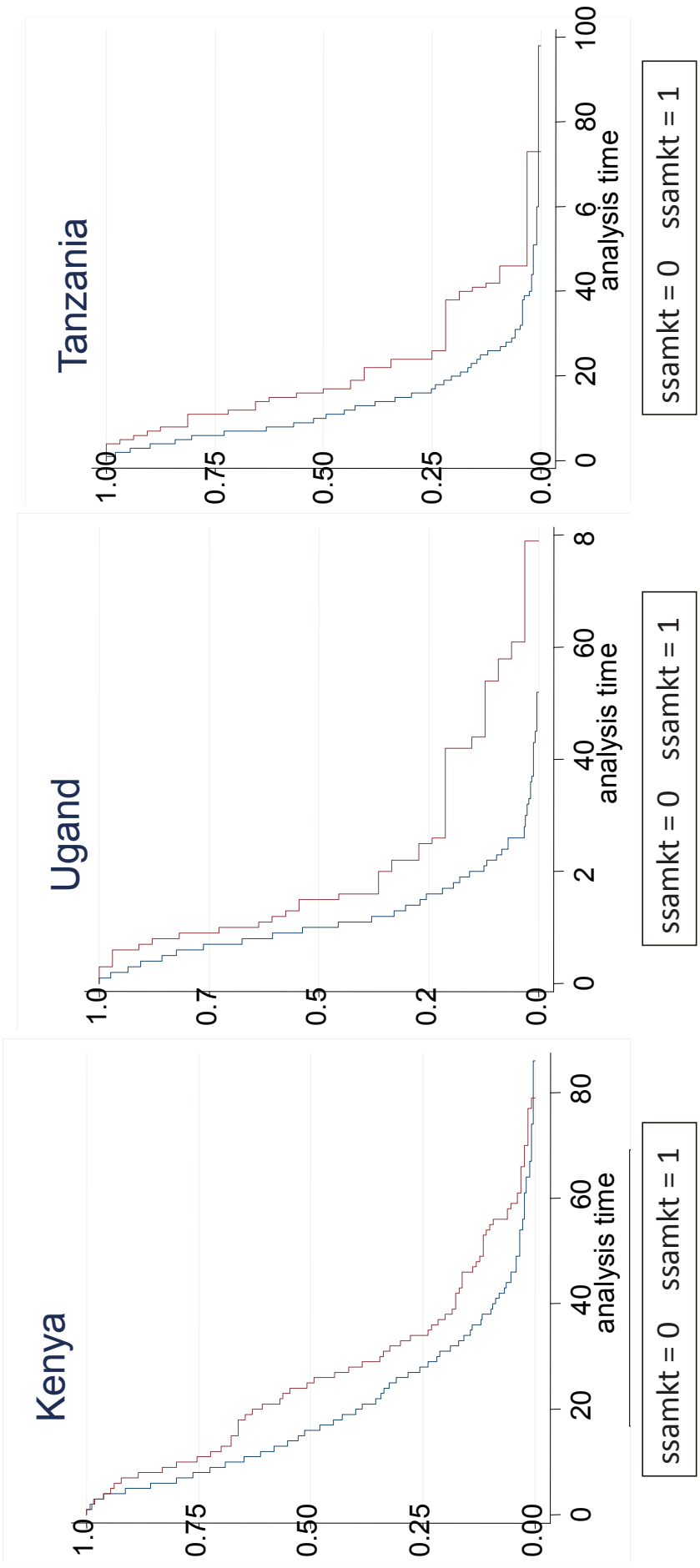


Figure 3: Probability of manufacturing firms' survival in EAC by market destination

5.2 Multivariate analysis of the determinants of firm's performance

Different model variants were estimated using OLS to analyse the effect of the change in market size on firm's performance with economic integration (Tables 7-8). The discussion focuses on significant estimates. As discussed above, two variables were constructed to measure productivity,namely, output per worker and value added per worker.

Given that the Enterprise Survey dataset of 2006 is cross-sectional in nature, it was rather difficult to econometrically control for endogeneity problem and the self-selectivity bias. These problems are easily addressed in a panel setting. Similarly, the paper was not able to capture productivity growth and previous export status of manufacturing firms. Despite these data weaknesses, the analysis reveals some interesting findings for policy actions. The post estimation robust test using Ramsey reset test using the powers of the fitted values of the dependent variables, under the null hypothesis that the model has no omitted variables could not be rejected F(3,253)=3.10 at the probability of 0.0274). Also, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity of constant variance under the null hypothesis could not be rejected at 10% significance level.

It is evident from Table 7 and Table 8 that most variables are robust regardless of the measure of productivity with a few exceptions. Model 1 results do suggest that exporting firms in all the three countries have a productivity premium over their non-exporting counterparts. However, the results based on value added per worker (Model 4) are only positive and significant for Kenya. Overall, exporting firms are more productive compared to the non-exporters probably because of the learning by exporting brought about by knowledge and technological spill-overs from the competitors and consumers in the foreign markets.

Considering the export destinations for manufacturing firms broadly grouped into developed (USA and EU) and the Sub-Saharan market (EAC and COMESA), the results for Uganda are different from those of her other partner states (see Models 2, 3, 5, 6). While firms in Kenya and Tanzania reap a productivity premium from exporting to sub Saharan Africa market, those of Uganda benefit from exporting to developed countries. This implies that by 2005, Kenyan and Tanzanian firms were benefiting more from exporting in the region than Ugandan firms. However, there is a potential for Ugandan manufacturing firms to benefit from integration since its coefficient is economically feasible. Overall, exporting firms have a performance edge over the non-exporters and there are performance differences owing to export destinations. This implies that the respective policy makers should strive to reduce the sunk costs of foreign market entry such as access information, product modification and legal and regulatory framework in the foreign market.

As indicated in the descriptive statistics, Uganda has the lowest number of days of customs clearance compared to Tanzania and Kenya. However, for the Ugandan firms the coefficient on the number of days for customs clearance is positive and significant contrary to priori expectations. This is true for all model variants. Unlike in the above analysis (Table 7), a result on number of days of customs clearance have the expected sign and is statistically significant for Kenya Table 8 (see Model 2). Kenyan results imply that governments should strive to reduce the number of days of customs clearance in order to enhance firm performance in the region.

Table 7: OLS estimates on determinants of firms' performance - productivity proxied by output per worker

Variable	Model 1			Model 2			Model 3		
	Kenya	Tanzania	Uganda	Kenya	Tanzania	Uganda	Kenya	Tanzania	Uganda
	s/w	s/w	s/w	s/w	s/w	s/w	s/w	s/w	s/w
Exporting firm dummy	0.460** (0.012)	0.594* (0.078)	0.581** (0.013)						
Sub-Sahara market dummy				0.633*** (0.000)	0.753** (0.019)	0.369 (0.136)			
Developed market dummy							-0.435 (0.107)	0.174 (0.685)	1.087*** (0.001)
Customs days	-0.03 (0.102)	-0.009 (0.816)	0.032** (0.011)	-0.036** (0.035)	-0.014 (0.706)	0.036*** (0.005)	0.006 (0.685)	0.038 (0.210)	0.039*** (0.001)
Capacity utilisation	0.007* (0.067)	0.016*** (0.000)	-0.003 (0.472)	0.006* (0.095)	0.017*** 0.000	-0.004 (0.402)	0.001* (0.068)	0.015*** 0.000	-0.001 (0.787)
Manager experience	0.007 (0.346)	-0.013 (0.110)	0.000 (0.999)	0.006 (0.353)	-0.013 (0.123)	0.002 (0.836)	0.008 (0.287)	-0.013 (0.115)	-0.003 (0.744)
Foreign ownership dummy	0.224 (0.238)	0.436* (0.054)	0.514*** (0.008)	0.216 (0.250)	0.403* (0.074)	0.511*** (0.009)	0.268 (0.159)	0.510** (0.023)	0.570*** (0.003)
In processing zone dummy	-0.159 (0.233)	0.334** (0.030)	0.249* (0.078)	-0.156 (0.237)	0.355** (0.021)	-0.242* (0.090)	-0.0986 (0.459)	0.316** (0.041)	-0.256* (0.068)
Firm age	0.150* (0.072)	0.0294 (0.755)	-0.171* (0.081)	0.139* (0.094)	0.02 (0.832)	-0.167* (0.090)	0.145* (0.085)	0.042 (0.657)	-0.151 (0.118)
Use website dummy	0.316* (0.069)	0.530** (0.013)	0.562** (0.023)	-0.253 (0.145)	-0.499** (0.019)	-0.630** (0.011)	-0.424** (0.012)	-0.547** (0.011)	-0.631*** (0.009)
Have bank overdraft dummy	0.117 (0.392)	0.732*** (0.000)	1.389*** (0.000)	0.11 (0.414)	0.722*** (0.000)	1.415*** (0.000)	0.167 (0.220)	0.810*** (0.000)	1.427*** (0.000)
Region 2	0.242 (0.221)	0.474** (0.043)	-0.830*** (0.003)	0.28 (0.146)	0.454* (0.052)	-0.827*** (0.003)	0.413** (0.037)	0.492** (0.037)	-0.811*** (0.004)
Region 3	0.081 (0.735)	0.187 (0.622)	0.234 (0.434)	0.112 (0.637)	0.2 (0.596)	0.33 (0.268)	0.109 (0.650)	0.122 (0.748)	0.314 (0.282)
Region 4	0.296 (0.175)	-0.759*** (0.000)	0.515 (0.115)	0.289 (0.182)	-0.746*** (0.000)	0.547* (0.097)	0.323 (0.141)	-0.748*** 0.000	0.52 (0.109)
Constant	12.86*** (0.000)	14.55*** (0.000)	16.34*** (0.000)	13.18*** (0.000)	15.05*** (0.000)	16.99*** (0.000)	13.29*** (0.000)	15.15*** (0.000)	16.83*** (0.000)
Observations	395	269	306	395	269	306	395	269	306
R-squared	0.100	0.369	0.366	0.116	0.375	0.357	0.091	0.361	0.377

pvalue in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 8: OLS estimates on determinants of firms' performance - productivity proxied by Value added per worker

Variable	Model 4			Model 5			Model 6		
	Kenya	Tanzania	Uganda	Kenya	Tanzania	Uganda	Kenya	Tanzania	Uganda
	v/w	v/w	v/w	s/w	s/w	s/w	s/w	s/w	s/w
Exporting firm dummy	0.363** (0.039)	0.427 (0.188)	0.363 (0.102)						
Sub-Sahara market dummy				0.534*** (0.001)	0.540* (0.081)	0.196 (0.408)			
Developed market dummy							-0.407 (0.115)	0.151 (0.713)	1.032*** (0.001)
Customs days	-0.018 (0.310)	0.004 (0.913)	0.035*** (0.004)	-0.025 (0.134)	0.001 (0.971)	0.038*** (0.002)	0.012 (0.421)	0.037 (0.197)	0.037*** (0.001)
Capacity utilisation	0.007* (0.059)	0.016*** (0.000)	-0.002 (0.680)	0.006* (0.081)	0.016*** (0.000)	-0.002 (0.628)	0.007* (0.060)	0.015*** (0.000)	0.000 (0.962)
Manager experience	0.004 (0.521)	-0.018** (0.021)	0.005 (0.593)	0.004 (0.535)	-0.018** (0.024)	0.007 (0.495)	0.005 (0.455)	-0.018** (0.022)	0.001 (0.917)
Foreign ownership dummy	0.216 (0.235)	0.366* (0.094)	0.406** (0.028)	0.207 (0.252)	0.343 (0.116)	0.409** (0.029)	0.251 (0.169)	0.419* (0.051)	0.443** (0.015)
In processing zone dummy	-0.159 (0.215)	0.349** (0.018)	0.248* (0.068)	-0.159 (0.210)	0.365** (0.014)	-0.242* (0.076)	-0.109 (0.393)	0.337** (0.023)	-0.261* (0.051)
Firm age	0.162** (0.043)	0.0493 (0.588)	-0.178* (0.057)	0.152* (0.056)	0.0426 (0.639)	-0.175* (0.062)	0.157* (0.051)	0.058 (0.521)	-0.164* (0.075)
Use website dummy	0.330** (0.049)	0.473** (0.021)	0.758*** (0.001)	-0.27 (0.106)	-0.452** (0.027)	-0.807*** (0.001)	-0.414** (0.011)	-0.486** (0.018)	-0.779*** (0.001)
Have bank overdraft dummy	-0.058 (0.659)	0.682*** 0.000	1.203*** 0.000	-0.067 (0.609)	0.675*** 0.000	1.225*** 0.000	-0.018 (0.888)	0.738*** 0.000	1.213*** 0.000
Region 2	0.167 (0.380)	0.574** (0.011)	-0.900*** (0.001)	0.193 (0.297)	0.560** (0.013)	-0.898*** (0.001)	0.311 (0.102)	0.586*** (0.010)	-0.886*** (0.001)
Region 3	0.259 (0.261)	0.012 (0.975)	0.21 (0.462)	0.283 (0.215)	0.0206 (0.955)	0.274 (0.334)	0.281 (0.224)	-0.0345 (0.925)	0.241 (0.385)
Region 4	0.107 (0.611)	-0.657*** (0.001)	0.558* (0.075)	0.0994 (0.633)	-0.647*** (0.001)	0.577* (0.067)	0.128 (0.541)	-0.650*** (0.001)	0.557* (0.072)
Constant	12.39*** (0.000)	14.19*** (0.000)	15.64*** (0.000)	12.72*** (0.000)	14.64*** (0.000)	16.45*** (0.000)	12.82*** (0.000)	14.71*** (0.000)	16.29*** (0.000)
Observations	394	269	306	394	269	306	394	269	306
R-squared	0.086	0.362	0.351	0.100	0.365	0.347	0.082	0.358	0.370

pvalue in parentheses *** p<0.01, ** p<0.05, * p<0.1

Capacity utilisation is an important factor in influencing firm productivity in Tanzania and Kenya but not for Uganda after controlling for other factors. The results show that an increase in capacity utilization by one percent increases firm productivity by 0.02 percentage points. This implies that Kenyan and Tanzanian firms should be facilitated to take advantage of the enlarged market.

In line with the descriptive evidence, firms that are owned by foreigners have high performance in Uganda and Tanzania ranging between 0.4 and 0.6 percentage points compared to domestically owned firms. For Uganda and Tanzania the coefficients on foreign ownership have the expected positive sign and statistically significant. This can be attributed to the fact that foreign owned firms have more advanced technology and are able to hire high quality labour and at the same have more foreign market knowledge. Governments should strive to encourage more foreign direct investments as well as set policies directed at boasting domestically owned firms.

As expected, firms located in the industrial parks have a performance edge over firms that are scattered elsewhere. In Tanzania and Uganda, firms located in an industrial park are more productive compared to their counterparts located in other areas. The finding is consistent with the Government's deliberate drive towards creating industrial parks in order to create a conducive microeconomic condition for manufacturing firms. However, including the export destinations, the results for Uganda have unexpected sign though statistically significant.The results are robust for the Tanzanian firms.

In regard to the use of information technology, firms operating websites are likely to be more productive than their counterparts who do not. Firms operating website are 0.3 to 0.8 percentage points more productive across the three countries compared to their counterparts who do not use them (Models 1 and 4). Policy makers should focus on making the use of internet more affordable to manufacturing firms in order to facilitate online marketing and sourcing. However, the results change to unexpected signs after including the export destination.

Firm age as proxy for firm experience is imperative in influencing firm performance in Kenya but is insignificant for Uganda and Tanzania. This may be surprising for Uganda since Ugandan firms are still young as the industrial sector was destroyed during the many episodes of war in the country. In addition, the access to finance proxied by bank overdraft is an important determinant of firm performance in Tanzania and Uganda. For instance, a firm having access to an overdraft facility is 0.7 to 1.4 percentage points more productive compared to their counterparts (Model 1). This finding implies that policy makers should focus on easing financial access by stimulating financial development in the country.

The results also reveal significant regional productivity differences in Uganda and Tanzania but not in Kenya. This implies that the respective policy makers should focus on creating conducive macroeconomic environment in all regions where manufacturing firms are located so as to have a balanced advancement in the manufacturing industry.

6. CONCLUSIONS AND POLICY IMPLICATIONS

6.1 Conclusions

Using the Enterprise Survey of the World Bank of 2006, this paper has provided insights on the determinants of firm performance and survival in the context of the EAC. Specifically, the paper has analyzed the determinants performance and survival of manufacturing firms in three major EAC countries after the promulgation of the EAC that allow free market access. It has contributed to a growing knowledge that examines the effect on market access and competition in form of economic integration on firms' economic performance. While the EAC regulations require that individual governments formulate comprehensive policies to protect the domestic manufacturing firms, it might adversely affect the survival of firms. The results suggest that small and young firms face a higher hazard rate of failure. The EAC regulations are found to pose a challenge for small firms that are not research intensive and many of them have a high failure rate. At the other end of the spectrum, we find that large EAC manufacturing firms are further consolidating their positions in the EAC market by exploring the increased market size and information technology as many large firms that use websites are more productive and have a high sales and value added per worker. Thus, the East African manufacturing industry is witnessing a shift towards greater consolidation driven by changes in regulatory frameworks. In turn, this calls for concomitant changes in the competition policy for the manufacturing industry. The EAC enacted the Competition Act 2006 to promote competition in markets. However, since the manufacturing industry requires huge resources for R&D, the paper suggests that the competition policy for this industry should aim at making the market for final products contestable while allowing the intermediate market for technical know-how to be more concentrated. Keeping in mind that the uncertainty and lower profits associated with competition may hamper the incentive of manufacturing firms to undertake R&D, innovation and quality improvement, it might be better to allow consolidation in this industry for the emergence of national champions and engines of growth. Market exit should be taken as an indicator of efficiency where only the viable firms are able to adjust and face the competition in a new regulatory environment. In the case of the East African manufacturing industry, in particular, the governments' decision to allow foreign direct investment up to 100 percent equity in the manufacturing industry may encourage more foreign entrants and in turn more consolidation since foreign firms are more prone to mergers than domestic firms. Finally, research-oriented firms are found to have been able to find opportunities for survival in the changed scenario by exporting to more developed markets in Europe and America.

The paper results are in line with the findings in the literature, confirming that a firm's age and size positively correlated to its performance and survival. The nature of the firm ownership also influences its performance and survival, as firms owned by foreigners, are more likely to be large and exporters and subsequently survive longer in the industry.Overall, an exporting firm has an 8 percent greater probability to survive. Looking at the different export market destinations, firms that are exporting to markets in developed countries –USA and the European Union are found to have higher chances of survival up to 23 percent. There is therefore, a market specific 'export premium', especially associated with more competitive foreign export markets to developed due to high learning effects.

The findings based on the Kaplan-Meirshow that learning-by-exporting is market specific. In other words, there is a greater scope for learning in an advanced market compared to the less advanced market. This is supported by the paper findings that the productivity premium gap between exporters to advanced markets and non-exporters is much wider than the productivity premium gap between exporters to sub Saharan Africa and non-exporters. It may be the case that non-exporters find it much easier to imitate the best practices from firms exporting to less developed markets than from

firms exporting to more advanced markets hence maintaining a varied premium differential gap. Therefore, it is not exporting per se leading to productivity enhancement at firm level but the quality of the trading partners matters.

Firms exporting to neighbouring countries with common institutions, legal, and regulatory framework may not reap a premium as firms exporting to advanced markets are characterized by stronger product differentiation and market competition. On the other hand, high productivity is found as a precondition for foreign market entry regardless of the quality of the trading partners. The implication is that firms should be selective on the type of export markets to penetrate because different destinations are associated with different productivity premium. The improvement of the general macroeconomic environment in which firms operate will be very instrumental in reducing the sunk costs of foreign market entry. The government should design policies aimed at assisting firms to establish plants that the importers of the firms' products have prescribed as a precondition. Other factors found imperative in influencing firm productivity include regional differentials; being in the industrial park; having a website, and those having own generators outperform all others.

6.2 Policy implications

Policy makers in the region should strive at improving the business environment and the investment climate with special attention to small manufacturing firms. Reforms should reduce costs for small firms in particular to register and operate; ensure that industrial policies to support large firms do not impact negatively on small firms, and avoid poorly conceived small firms' support strategies that could also be counter productive. Specifically, government policy is needed to create many industrial parks in different parts of the country and solve the problem of power outages which will reduce the need for alternative sources that are more expensive. Additionally, East African governments should encourage the penetration of information technology across the region by subsidizing the computer prices and internet connection as well. The government should put in place an enabling environment that would encourage more private investment in IT infrastructure that will make connectivity faster and cheaper.

The EAC member countries should focus at building a holistic approach to improving manufacturing firms' access to finance especially for small manufacturing firms. Access to finance would help build capacity for small firms through upgrading their operations. Access to finance can be enhanced through lowering lending conditions to small businesses by banks and promoting financial sector development to diversify sources of funds and widen the range of lending instruments.

Furthermore, policies measures aimed at enhancing management and business development capacity through training, linkages and networks should be given due considerations in order to boost firm performance in the region. In other words government, donors and the private sector should work together and develop programmes to enhance local capacity to deliver training and development services, enable business knowledge transfer, ensure access to relevant technology, attract management talents to the industry, promote linkages between large firms and multinational enterprises and small firms and encourage business clusters.

In line with the above policy implications, there is need for policy makers to strive at creating an institutional mechanism to support both small and large exporting firms' development. Implementing necessary initiatives for private sector development hinges on long-term commitment on the part of all stakeholders including governments, donors, and the international and local private sector. There is a need for institutional mechanisms, such as manufacturing (both small and large) firms' development centres, to ensure such commitment and coordinate efforts by various stakeholders.

Future research might focus on four main aspects. First, studies should consider export strategies forservices as well as manufacturing firms. Theories explaining the internationalization of manufacturing and construction/ services firms should consider the wide range of demand and supply-side factors which influence business internationalization. Studies should explore whether the approach to internationalization differs between industries (i.e. finer level studies focusing upon standard industrial categories), whether the approach to internationalization differs depending upon the environmental context (i.e. rural or urban) of a business's main operational location and the types of businesses in terms of their resource endowments (including the entrepreneur) and their ability to acquire resources. Future studies should focus on how firms learn and disseminate exporting skills throughout their organizations as well as how firms can successfully implement their acquired exporting competencies and social networks. The identification of types of exporting firms in terms of their mobilization of resources and development of their strategies (Julien et al. 1997) is also worthy of additional research attention.

7. REFERENCES

Agarwal, R. and D. B. Audretsch (2001), 'Does entry size matter? The impact of the life cycle and technology on firm survival', The Journal of Industrial Economics, 49, 21-43.

Audretsch, David B. (1991), "New-Firm Survival and the Technological Regime".Review of Economics and Statistics, Vol. 60, pp. 441-450.

Audretsch, David B. (1995), Innovation and Industry Evolution. Cambridge, MA: MIT Press. Audretsch, David B. and Mahmood, Talat (1995): "New-Firm Survival: New Results using a Hazard Function". Review of Economics and Statistics, Vol. 77, pp. 97-103.

Audretsch, David B.; Houweling, Patrick and Thurik, A. Roy (2000): "Firm Survival in the Netherlands". Review of Industrial Organization, Vol. 16, pp. 1-11.

Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J.W., Habarurema, J., Oduro, A., Oostendorp, R., Pattilo, C., Soderbom, M., Teal, F., and Zeufack, A. (2000), "Exports and Firm-level Efficiency in African Manufacturing", Oxford University, Centre for the Study of African Economies Working Paper Series, WPS/2000-16, Oxford.

Bruderl, J., P. Preisendorfen and R. Ziegler (1992), 'Survival chances of newly founded business organizations', American Sociological Review, 57: 227-242.

Doms, M., T. Dunne and M. J. Roberts (1995), 'The role of technology use in the survival and growth of manufacturing plants', International Journal of Industrial Organization, 13, 523-542.

Dunne, T., M. J. Roberts and L. Samuelson (1988), 'Patterns of firm entry and exit in the U.S. manufacturing industries', RAND Journal of economics, 19: 495-515.

Evans D.S. (1987b), 'The relationship between firm growth, size and age:Estimates for 100 manufacturing industries',Journal of Industrial Economics,35:567-81

Freeman, J., G. R. Carroll and M. T. Hannan (1983), 'The liability of newness: Age dependence in organizational death rates', Americal Sociological Review, 48:692-710.

Grossman, G. M., and Helpman, E. (1991), Trade, Innovation, and Growth in the Global Economy. Cambridge, Mass.: MIT Press.

Hall, B. H. (1987), 'The relationship between firm size and firm growth in the US manufacturing sector', The Journal of Industrial Economics, 35, 583-606.

Honjo, Y. (2000), Business Failure of New Firms: An Empirical Analysis Using a Multiplicative, Hazards Model. International Journal of Industrial Organization, 18 (4): 557-574.

Hamilton, L.C. (2009), Statistics with Stata, Updated for Version 10, Brooks/Cole 10 Davis Drive Belmont, CA 94002-3098 USA.

Jovanovic, B. (1982), "Selection and the Evolution of Industry," Econometrica, 50, 649-670.

Klepper, S. (2002), 'The capabilities of new firms and the evolution of the US automobileindustry', Industrial and Corporate Change, 11, 645-666.

Klepper, S. and K. L. Simons (2000), 'The Making of an Oligopoly: Firm Survival and Technological Change in the Evolution of the U.S. Tire Industry', Journal of Political Economy, 108: 728-760.

Lovell, C.A.K., J. Defourny, A.G.M. N'Gbo (1992), "Variation in Productive Efficiency in French Workers' Cooperatives", The Journal of Productivity Analysis, 3(1-2): 103-117.

Levitt T. (1983), "The Globalization of Markets", Harvard Business Review", May - June 1983

Mata J, Portugal P. (2002), The survival of new domestic and foreign-owned firms, Strategic Management Journal, 23, 323-343.

Mata J, Portugal P, Guimaraes(1995),'The survival of new plants: Start up conditions and post entry evolution', International Journal of Industrial Organization, 13: 459-481.

Pakes, A. and R. Ericson (1987), "Empirical Implications of Alternative Models of Firm Dynamics," SSRI Working Paper, University of Wisconsin, Madison.

Pfeffer, J., and G.R. Salancik (1978), The External Control of Organizations. New York: Harper and Row.

SEATIN-Uganda (2008), 'Implications of the EAC-EU Economic Partnership Agreement for Uganda's Fisheries Sector', 2008.

Stiglitz, E.J. (2002), Globalisation and its discontents.Great Britain: Penguin Press.

Strotmann, H. (2007), 'Entrepreneurial Survival', Small Business Economics, 28, 87-104.

Tveteras, R. and G. E. Eide (2000), 'Survival of New Plants in Different Industry Environments in Norwegian Manufacturing: A Semi-proportional Cox Model Approach', Small Business Economics, 14: 65-82.

Uganda Bureau of Statistics (2006), 'Statistical Abstract', Uganda Bureau of Statistics, Kampala. World Bank (2006), Enterprise Survey data 2006, Washington Dc 2006.

8. LIST OF EPRC RESEARCH SERIES

Listing of EPRC Research Series published since 2009 to date. Full text format of these and earlier papers can be downloaded from the EPRC website at www.eprc.or.ug

No	Author(s)	Title	Year
82	Wokadala James, Nyende Magidu, Guloba Madina and Barungi Mildred	Public Spending In The Water Sub-Sector In Uganda: Evidence From Program Budget Analysis	November 2011
81	Lawrence Bategeka and John M. Matovu	Oil Wealth And Potential Dutch Disease Effects In Uganda	June 2011
80	Shinyekwa Isaac and Othieno Lawrence	Uganda's Revealed Comparative Advantage: The Evidence With The EAC And China	September 2011
79	Othieno Lawrence & Shinyekwa Isaac	Trade, Revenues And Welfare Effects Of The EAC Customs Union On Uganda: An Application Of WITS-SMART Simulation Model	April 2011
78	Kiiza Julius, Bategeka Lawrence & Ssewanyana Sarah	Righting Resources-Curse Wrongs In Uganda: The Case Of Oil Discovery And The Management Of Popular Expectations	July 2011
77	Guloba Madina, Wokadala James &Bategeka Lawrence	Does Teaching Methods And Availability Of Teaching Resources Influence Pupil's Performance?: Evidence From Four Districts In Uganda	August 2011
76	Okoboi Geoffrey, Muwanika Fred, Mugisha Xavier and Nyende Majidu	Economic And Institutional Efficiency Of The National Agricultural Advisory Services' Programme: The Case Of Iganga District	May 2011
75	Okumu Luke &Okuk J. C. Nyankori	Non-Tariff Barriers In EAC Customs Union: Implications For Trade Between Uganda And Other EAC Countries	December 2010
74	Kasirye Ibrahim & Ssewanyana Sarah	Impacts And Determinants Of Panel Survey Attrition: The Case Of Northern Uganda Survey 2004-2008	April 2010
73	Twimukye Evarist, Matovu John Mary Sebastian Levine & Birungi Patrick	Sectoral And Welfare Effects Of The Global Economic Crisis On Uganda: A Recursive Dynamic CGE Analysis	July 2010
72	Okidi John & Nsubuga Vincent	Inflation Differentials Among Ugandan Households: 1997 - 2007	June 2010
71	Hisali Eria	Fiscal Policy Consistency And Its Implications For Macroeconomic Aggregates: The Case Of Uganda	June 2010
70	Ssewanyana Sarah &Kasirye Ibrahim	Food Security In Uganda: A Dilemma To Achieving The Millennium Development Goal	July 2010
69	Okoboi Geoffrey	Improved Inputs Use And Productivity In Uganda's Maize Sector	March 2010
68	Ssewanyana Sarah & Kasirye Ibrahim	Gender Differences In Uganda: The Case For Access To Education And Health Services	May 2010
67	Ssewanyana Sarah	Combating Chronic Poverty In Uganda: Towards A New Strategy	June 2010
66	Sennoga Edward and Matovu John Mary	Public Spending Composition And Public Sector Efficiency: Implications For Growth And Poverty Reduction In Uganda	February. 2010
65	Christopher Adam	The Conduct Of Monetary Policy In Uganda: An Assessment	September 2009

64	Matovu John Mary, Twimukye Evarist, Nabiddo Winnie &Guloba Madina	Impact Of Tax Reforms On Household Welfare	May 2009
63	Edward Sennoga, John M. Matovu & Evarist Twimukya	Tax Evasion And Widening The Tax Base In Uganda	May 2009
62	Twimukye Evarist & Matovu John	Macroeconomic And Welfare Consequences Of High Energy Prices	May 2009
61	Matovu John & Twimukye Evarist	Increasing World Food Price: Blessing Or Curse?	May 2009
60	Sennoga Edward, Matovu John & Twimukye Evarist	Social Cash Transfers For The Poorest In Uganda	May 2009
59	Twimukye Evarist, Nabiddo Winnie & Matovu John	Aid Allocation Effects On Growth And Poverty: A CGE Framework	May 2009
58	Bategeka Lawrence, Guloba Madina & Kiiza Julius	Gender and Taxation: Analysis of Personal Income Tax (PIT)	April 2009
57	Ssewanyana Sarah	Gender And Incidence Of Indirect Taxation: Evidence From Uganda	April 2009
56	Kasirye Ibrahim &Hisali Eria	The Socioeconomic impact of HIV/AIDS on Education outcomes in Uganda: School Enrolment and the Schooling Gap in 2002/03	November 2008
55	Ssewanyana Sarah & Okidi John	A Micro simulation Of The Uganda Tax System (UDATAX) And The Poor From 1999 To 2003	October 2008
54	Okumu Mike, Nakajjo Alex & Isoke Doreen	Socioeconomic Determinants Of Primary Dropout: The Logistic Model Analysis	February. 2008
53	Akunda Bwesigye Denis	An Assessment Of The Casual Relationship Between Poverty And HIV/AIDS In Uganda	September. 2007
52	Rudaheranwa Nichodemus, Guloba Madina & Nabiddo Winnie	Costs Of Overcoming Market Entry Constraints To Uganda's Export-Led Growth Strategy	August 2007
51	Kasirye Ibrahim	Vulnerability And Poverty Dynamics In Uganda, 1992-1999	August 2007
50	Sebaggala Richard	Wage Determination And Gender Discrimination In Uganda	May 2007
49	Ainembabazi J. Herbert	Landlessness Within The Vicious Cycle Of Poverty In Ugandan Rural Farm Household: Why And How It Is Born?	May 2007
48	Obwona Marios & Ssewanyana Sarah	Development Impact Of Higher Education In Africa: The Case Of Uganda	January 2007
47	Abuka Charles, Egesa Kenneth, Atai Imelda & Obwona Marios	Firm Level Investment: Trends, Determinants And Constraints	March 2006
46	Okidi A. John, Ssewanyana Sarah Bategeka Lawrence & Muhumuza Fred	Distributional And Poverty Impacts Of Uganda's Growth: 1992 To 2003	December 2005
45	John A. Okidi, Sarah Ssewanyana, Lawrence Bategeka & Fred Muhumuza	Growth Strategies And Conditions For Pro-Poor Growth: Uganda's Experience	December 2005
44	Obwona Marios , Wasswa Francis & Nambwaayo Victoria	Taxation Of The Tobacco Industry In Uganda: The Case For Excise Duty On Cigarettes	November 2005
43	Obwona Marios & Ndhaye Stephen	Do The HIPC Debt Initiatives Really Achieve The Debt Sustainability Objectives? Uganda's Experience	August 2005
42	Rudaheranwa Nichodemus	Trade Costs Relating To Transport Barriers On Uganda's Trade	May 2005

ECONOMIC POLICY RESEARCH CENTRE - EPRC
Plot 51 Pool Road, Makerere University
P. O. Box 7841, Kampala - Uganda
Tel: +256 414-541022
E-mail: eprc@eprc.or.ug
Website: www.eprc.or.ug