A discrete time analysis of export duration in Kenya: 1995 -2014

MAJUNE, Socrates

University of Nairobi

31 December 2015

A DISCRETE TIME ANALYSIS OF EXPORT DURATION IN KENYA: 1995 - 2014

MAJUNE KRAIDO SOCRATES

X50/68921/2013

A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF ECONOMICS, UNIVERSITY OF NAIROBI IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF ARTS DEGREE IN ECONOMICS OF THE UNIVERSITY OF NAIROBI

NOVEMBER, 2015

DECLARATION

I declare that this project is my original work and has not been submitted for the award of a degree in any other university or institution.

MAJUNE KRAIDO SOCRATES

SIGNATURE:…… DATE:……..

This paper is submitted for the award of the degree of Master of Arts in Economics with my approval as the university supervisor.

DR. KAMAU GATHIAKA

SIGNATURE:…… DATE:……..

ACKNOWLEDGEMENTS

I would first of all like to thank God for granting me good health and faith during my Masters studies. I am also grateful to my project supervisor, Dr. Kamau Gathiaka, for the time and effort he took in reviewing my work and giving constructive suggestions.

I would also like to appreciate the intellectual contributions of the following persons on my paper: Dr. Martha Denisse Pierola (World Bank), Dr. Dick Kamuganga (Graduate Institute, Geneva), Dr. Eliud Moyi (University of Cape Town), Dr. Joy Kiiru (UON), Dr. Bethuel Kinyanjui (UON), Dr. Anthony Wambugu (UON), Dr. Nelson Owour (UON), Mrs. Laura Nelima (UON), Ms. Vaishnavi Ram Mohan (LSE), Mr. Martin Leboo (UON) and participants of the School of Economics seminar at UON on 2nd October, 2015. To Mr. Sila Muthoka (UON), many thanks for the scholarly conversations we occasionally had. My gratitude also goes to The Tokyo Foundation (The Ryoichi Sasakawa Young Leaders Fellowship Fund) and The University of Nairobi for sponsoring my studies. I will not forget the support of my M.A Economics 2013/2015 (Module I) classmates (especially Mrs. Rose Apunda and Mr. Martin Leboo).

Lastly, I would like to sincerely thank the support of my family, dad Kraido, mum Rose, brother Tamati and sisters Brenda and Siti. I will forever be grateful for your encouragement.

The views expressed in this paper are my own and I solely bear the responsibility for any errors and/or omissions.

DEDICATION

This project is dedicated to my grandparents who I spent a lot of my childhood with, Eliud and Prisca Omuse of Kabkara Village. It is also dedicated to my most inspirational nursery school teacher, Madam Rabecca of Chwele Boys' and my most inspirational lecturers at undergraduate and post-graduate levels, Mrs. Anne Wang'ombe, Ms. Speranza Migue and Prof. Germano Mwabu respectively. I also share this joy with my mentors, Prof Olubayi Olubayi and Ms. Jacinta Mwikali, not forgetting all athletes (sprinters). I cannot forget my family: dad Kraido Majune, mum Rose Kitayi, brother Tamati Majune, sisters Brenda Majune and Siti Kraido, cousin Ian Watua and aunty Janet Omuse.

LIST OF ACRONYMS AND ABBREVIATIONS

ACP	African Caribbean and Pacific
AGOA	African Growth and Opportunities Act
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
EPA	Economic Partnership Agreements
EPC	Export Promotion Council
EPZA	Export Processing Zones Authority
EU	European Union
GSP	Generalized System of Preferences
LSE	London School of Economics
PTA	Preferential Trade Agreements
SSA	Sub-Saharan Africa
UON	University of Nairobi
US	United States
WTO	World Trade Organization

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

The scarcity of studies on export duration in Kenya provide the drive of this study. It looks at the determinants of export duration in Kenya in a discrete-time model. Using HS-6 digit export product-level data between Kenya and 203 partners two major results emerge. First, the median export period in Kenya is one year with only 36% of exports surviving past that period. Secondly, the main determinants of export survival in Kenya are: cost of infrastructure (liner shipping connectivity, air transportation network, cost of export and cost of starting a business), macroeconomic stability (GDP, exchange rates and financial inclusivity), improved governance, labour force, regional membership into East African Community, and membership to AGOA.

CHAPTER ONE

1.0 BACKGROUND

The concept of trade survival is relatively new in the trade literature[1]. Mainstream international trade theory[2] assumes that trade will persist once established and for this reason often focuses on trade creation or extensive margin. Extensive margin is where a country expands exports by introducing a new product in a new market, an existing product in a new market, or a new product in an existing market (Fugazza and Monila, 2011). In contrast, intensive margin[3] entails maintaining and increasing existing exports with existing partners thus enhancing survival and deepening of existing export relationships.

Export survival, which is the concern of this study, was first tested by Besedeš and Prusa (2006a) whose key insight was that trade is short-lived. Their results contradicted the existing literature by noting that U.S imports were extremely brief with a median survival period of 2 to 4 years. More so, only half of them survived past the first year and about 20% existed beyond five years. This benchmark study generated a great deal of interest among researchers and results in other countries have confirmed that trade is indeed short-lived (all medians), 2 years in Germany (Nitsch, 2009), 1-2 years for 46 developing countries (Besedeš and Prusa, 2011) and only about 20% of Kenyan exports survive past the first year (Kinuthia, 2014). Subsequently, (Hess and Persson, 2011) found the median import duration in the U.S between 1962 and 2006 to be 1 year.

[1] Survival studies are common in biostatistics (Jenkins, 2005; Cameron and Trivedi, 2005)
[2] These are traditional theories of Absolute Advantage, Comparative Advantage and Hecksher-Ohlin.
[3] Definition of intensive margin is borrowed from Besedes and Prusa (2011) and (Brenton, Cadot, and Pierola, 2012). Developing countries perform well at the extensive margin than the intensive margin (Brenton et al., 2012)

Export survival can be defined as the average duration of export spells (Brenton, Cadot, and Pierola, 2012). Using a hypothetical example of the relationship of apparel exports from Kenya to the U.S, assume that it was until 2000 that Kenya started exporting khaki trousers to the U.S. If this relationship remains uninterrupted up to 2005, then the period between 2000 and 2005 is a spell. In this case, survival is the average number of years trade is experienced continuously for 5 years. Trade flows could have multiple spells where they disappear for a certain period and restart. Nonetheless, it is critical to study trade survival to prevent failure in the initial years besides deepening existing relationships. Survival also enhances high export growth even in the absence of deepening. It also ensures extensive margin-specific policies remain buoyant in line with the long-run export growth.

Previous studies have identified various determinants of survival including product specific factors (homogeneous or differentiated) and exporter/importer specific factors (market size, distance, trade agreements, experience, language, colonial history, exchange rates, entry costs i.e. fixed and sunk, quality of institutions and, state of financial systems). However, they conclude that determinants of survival are region/country-specific. The current study builds upon Kinuthia's (2014) study by addressing the question of survival of Kenyan exports between 1995 and 2014. Other studies such as (Besedeš et al., 2006b, Brenton et al., 2009, Fugazza et al., 2011, Kamuganga, 2012 and, Carrère et al., 2012 and 2014) have only included Kenya as part of their panel. This study places main emphasis on the impact of non-reciprocal trade agreements i.e. AGOA (African Growth and Opportunity Act) and labour force on export survival in Kenya, which have received little attention.

1.1 THE TREND IN EXPORTS

The export sector in Kenya has experienced various regimes. They include a protectionist import substitution regime (1963-1979), Structural Adjustment Programs (1981-1994), globalization in 1995 and currently Vision 2030 (ROK, 2015). The last two regimes have seen Kenya aggressively pursue trade liberalization[4] schemes such as joining the World Trade Organization (WTO) and reducing tariffs and non-tariff barriers. Kenya has also embraced partnerships and she is currently a member of five trading blocks[5]. She also has over 34[6] bilateral agreements, is a signatory of three Preferential Trade Agreements[7] (PTAs) and has incorporated numerous export promotion and marketing strategies[8] (ROK, 2015).

However, Kenya's overall export performance has been modest, specifically after liberalization in 1995 as per Figure 1. The share of exports to GDP has stagnated at around 20% in recent years although this share stayed above 30% in the 1960s, 1970s, 1980s and early 1990s and even peaked at 39% in 1993. This decline has been over 13% since the early 1990s and is in contrast with other emerging economies whose shares of exports to GDP have immensely increased (World Bank, 2013). Additionally, the growth of exports has often been below 10% and recent years of 2012 and 2013 have experienced negative growth rates. Notice the 32% and 9% export growth in 1993 and

[4] This is the opening up of the market and is mainly aimed at promoting exports

[5] East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA), the Inter-governmental Authority on Development (IGAD), Indian Ocean Rim-Association of Regional Cooperation (IOR-ARC) and the Tripartite Agreement between the COMESA, EAC and the Southern African Development Community (SADC) signed on 10th June 2015 (ROK, 2015).

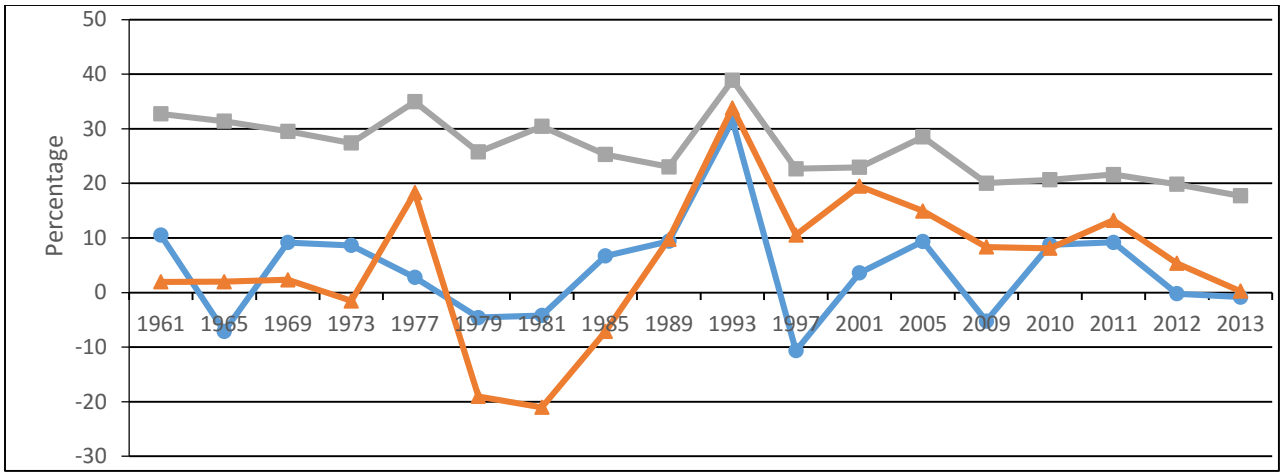
[6] Bangladesh, Canada, China, Comoros, Congo, DRC, Djibouti, Egypt, Ethiopia, Hungary, India, Iran, Iraq, Lesotho, Liberia, Mauritius, Mozambique, Netherlands, Nigeria, Pakistan, Russia, Rwanda, Somali, South Africa, South Korea, Sudan, Swaziland, Tanzania, Thailand, Turkey, Ukraine, Zambia, Zimbabwe and Libya

[7] WTO's Generalised System of Preferences (GSP), the African Growth Opportunity Act (AGOA) of the United States and the Economic Partnership Agreements (EPAs) of the European Union (EU).

[8] This is mainly done by the following bodies; Export Promotion Council (EPC), Export Processing Zones Authority (EPZA), Kenya National Chamber of Commerce and Industry among others (ROK, 2015).

2010 respectively to the -1% in 2013. Trade deficits were low in the pre-1995 period but the post-1995 period has seen them widen as imports have greatly surpassed exports.

Figure 1: Export growth, Import growth and share of Exports in GDP in Kenya (1961-2013)



Source: World Bank data (2015)

Agricultural products and food dominate the export sector though manufactured products have also greatly increased as per Table 1. With regards to manufactured exports, it can be seen that clothing and textile exports have also increased steadily after 2000. This can be attributed to the implementation of AGOA. Nevertheless, service exports have also improved and even accounted for 44% of total exports in 2012 (World Bank, 2013, ROK, 2015). Sub-Saharan Africa (SSA) is the main export market for Kenya at over 45% with Uganda, Tanzania, United Kingdom, Netherlands and United States as the major destinations (ROK, 2015).

Table 1: Merchandise exports in Kenya in millions US$ (1995 – 2014)

Product	HS-Code	1995	2000	2005	2010	2012	2013	2014
Agricultural products	01-15	1158	1062.3	1629.1	2861	3226.5	3156.7	3104.8
Food	16-24	1024	927.1	1287.4	2320	2599.0	2531.3	2406.7
Manufactures	24,46,96,	503	325.1	1088.8	1688	2208.3	2186.4	2049.6
Fuels and mining products	25-27	163.2	176.6	692.7	308	403.9	333.4	842.5
Chemicals	28-38	121	87.5	287.0	449	644.4	565.1	541.7
Fuels	27	0	126.9	626.5	209	254.5	217.9	605.3
Machinery and transport equipment	84-89	29	8.4	97.5	253	319.7	316.1	246.3
Clothing	61-63	10	8.8	185.3	189	240.9	279.3	324.8
Iron and steel	72-73	95	34.2	122.9	147	176.8	189.0	147.9
Pharmaceuticals	30	0	30.8	38.2	73	139.3	118.5	128.8
Textiles	50-63	33	26.0	49.4	60	70.0	61.4	62.3
Transport equipment	86-89	0	2.1	41.7	78	84.4	96.1	74.6
Office and telecom equipment	85	4	0.7	7.9	69	96.4	66.6	25.9
Telecommunications equipment	84-85	0	0.5	3.8	31	31.3	39.2	12.9

Source: World Trade Organization (2015)

The survival of Kenya's exports to SSA and the world has been in decline especially after 2011. Mirror data from the World Integrated Trade Solutions database in Table 2 shows that the number of export relationships between Kenya and SSA declined by 53% in the first year (1997-1998) and 609 relationships had died by the seventh year (2004). Subsequently, exports to the World declined by 58% in the first year and 1,042 relationships had died by 2004. However, there was a slight improvement after 2004 when the share remained above 40% and 30% for SSA and World

respectively until 2014, when it dropped to 34% and 28% (SSA and World respectively).In general, the number of export relations between Kenya and SSA in 2014 were nearly three times less than the starting year of 1997. The same export relationship to the world was over three and a half times less in 2014 in comparison to 1997.

Table 2: Duration of Kenyan Exports to Sub-Saharan Africa and the World (Mirror data of HS-6 Digit Codes)

Sub-Saharan Africa			**World (All countries)**	
Year	Number Of Export Relationship	Share	Number Of Export Relationship	Share
1997	1034	100%	1578	100%
1998	490	47%	658	42%
2001	386	37%	503	32%
2004	425	41%	536	34%
2005	432	42%	555	35%
2007	358	35%	467	30%
2009	457	44%	561	36%
2010	433	42%	536	34%
2011	488	47%	584	37%
2012	463	45%	554	35%
2013	431	42%	532	34%
2014	353	34%	449	28%

Source: World Integrated Trade Solutions (2015)

The survival of Kenya's exports can also be deduced from empirical literature. Kinuthia (2014) argues that only one out of five export relations survive past one year in Kenya. This incidence is even lower in non-SSA countries. Fugazza et al. (2011) state that only countries from the

developing South, Kenya included, had a median survival of below 3 years with some falling as low as 1 year.

These facts leave us with the main question - what really determines survival of exports in Kenya? This study reviews the impact of AGOA and labour force. There have been attempts to assess the influence of regional trading blocs and reciprocal agreements on survival studies but non-reciprocal agreements have been scantly covered. AGOA which is of interest in this study started in 2000 and has been noted to have enhanced apparel exports in Kenya (Condon et al., 2011). Hence, a review of the impact of this agreement on survival is critical. Equally, survival studies have not covered the impact of labour force which is critical in determining export performance (Krugman et al., 1995, Fuguzza, 2004, UNCTAD, 2005). Labour force provides human capital that is engaged in production which in turn enhances the supply capacity of the export sector. Furthermore, skilled labour is critical for exports as it is positively resonates with technological advancements besides reducing cost of production (Fuguzza, 2004, UNCTAD, 2005, Majeed et al., 2006, Were, 2011). Therefore, a review of the effect of labour force on export survival is critical given Kenya's high labour-endowment.

The other basis of this study is purely econometric. Recent trade-survival literature has advocated for the use of discrete survival models as opposed to the previously used continuous survival model[9] of Cox (1972). The latter model has been faulted for causing econometric problems that lead to biased results, hence this study would like to apply the recently preferred Hess and Persson (2012) model[10] on Kenyan data.

[9] Discrete time models are used because even though survival occurs in a continuous time frame (yearly for trade), spell lengths are observed in discrete form.

[10] It has only been tested by (Hess and Persson, 2011) on EU-15 imports, (Corcoles et al., 2015) on Spanish exports, (Besedes, 2013) on export data for Mexico, USA and Canada, (Carrere and Strauss-Khan, 2012; 2014) and on firm-level data by (Stirbat, Record, and Nghardsaysone, 2013) and (Fugazza and McLaren, 2014).

1.2 STATEMENT OF THE PROBLEM

"Trade lasts forever". This seems to have been the assumption of traditional theories of trade[11] until Besedeš and Prusa (2006b) disapproved them. These authors proved that U.S imports only existed for median period of 2 to 4 years. Subsequently, Nitsch (2009) proved that German exports only survived for a median of 2 years, Spanish exports survived for a median of 1 year (Corcoles et al., 2015) while (Besedeš and Prusa, 2011) proved that the median export survival period for 46 developing countries was 1 to 2 years. Recently, Arawomo (2015) showed that only 49.4% of Nigerian exports to her biggest markets (United State, Germany, France, China, and Japan) survived past the first year. Kinuthia (2014) was the first to conduct a similar study in Kenya[12]. Of the bilateral exports to 221 countries between 1995 and 2010, only a fifth survived past the first year and 10% remained resolute to the 13th year.

Facts from Figure 1, Table 2 and empirical evidence indicate that survival of Kenyan exports is low. What explains this trend? In this regard, this study proposes to mainly assess the impact of non-reciprocal preferential trade agreements (AGOA) and labour force among other variables on Kenya's export survival. Preferential trade agreements have been in existence for some time (for instance AGOA since 2000) but survival studies have mostly confined themselves to regional trade agreements. Furthermore, a lot of research has been done to test the extensive margin of these agreements with little on the intensive margin (Condon et al., 2011). Similarly, labour force is theoretically predicted to have a positive impact on exports but its impact on exports in Africa

[11] These are theories of Absolute Advantage, Comparative Advantage and Hecksher-Ohlin.

[12] Note that some studies had used Kenya in their panel on the same subject but none had done a Kenya-specific study (i.e. Besedes et al., 2006a; Brenton et al., 2009; Fugazza et al., 2011; Kamuganga, 2012 and; Carrere et al., 2012 and 2014).

remains limited (Were, 2011) and it has not been covered by export survival studies. Hence, it will be critical to test the effect of these variables on export survival.

There has also been a strong need for trade researchers to apply discrete survival models other than the previously widely used continuous survival model of Cox (1972). A disclaimer towards using the last model is mainly due to econometric problems such as incorrect imposition of proportionality, failure to account for unobserved heterogeneity and failure to deal with tied durations. These problems cause bias in the estimated covariate effects. The Hess and Persson (2012) discrete-time model has been fronted as the alternative. So far, only a few studies have tested it, Hess and Person (2012) on US import data, (Besedeš, 2013) on NAFTA (North American Free Trade Agreement), (Stirbat et al., 2013) and (Fugazza and McLaren, 2014) on firms in Lao PDR and Peru respectively. The model's applicability to the Kenyan data is also unknown.

Hence, this study's distinctiveness is based on addressing major gaps in knowledge: the impact of the dual factors named above on survival, adding to Kinuthia (2014) as the only Kenya-specific study to my knowledge and, testing the Hess and Persson (2012) model on Kenyan data.

1.3 RESEARCH QUESTIONS

This study addresses the following research questions:

i. What is the survival rate of exports from Kenya?
ii. What is the influence of non-reciprocal trade agreements and labour force on duration of Kenyan exports?
iii. How can export duration in Kenya be lengthened?

1.4 OBJECTIVES

The main objective of this study is to establish determinants of export survival in Kenya between 1995 and 2014 with specific objectives being to:

i. Establish the survival rate of exports from Kenya.

ii. Establish the influence of non-reciprocal trade agreements and labour force on survival of Kenyan exports.

iii. Recommend policies on how export trade in Kenya could be sustained for a longer period.

1.5 SIGNIFICANCE OF STUDY

This study highlights concerns in literature and sequentially informs policies in three ways. Foremost, it adds to the existing trade survival literature specifically on Kenya by incorporating non-reciprocal agreements and labour force. The inclusion of these factors in export survival studies has been minimal. This study is also important in policy application. Several stakeholders such as trade experts in the government need such results to aid in formulating informed policies that are aimed at promoting sustainability of exports. This study is also key to exporters from Kenya as they seek to enter markets. An important *caveat* is that despite being a product-level study, results from this study will help firms to make inferences in their pursuit of penetrating markets. In general, studying duration of Kenyan exports adds an important stylized fact to trade literature in Kenya.

CHAPTER TWO

2.1 LITERATURE REVIEW

This section reviews theoretical and empirical literature on export survival. It is divided into three parts comprising theoretical literature review, empirical literature review and an overview of the literature.

2.2 THEORETICAL LITERATURE REVIEW

Trade duration has been widely cited as a recent issue in the Theory of International Trade and as a result it has been scarcely covered[13]. Neither did pre-classical nor classical theories [14]forecast it as they generally assumed that trade would remain persistent from inception. This section will demonstrate that it was until the mid-2000s that an elaborate theory was established as far as survival of trade is concerned. A chronological development of this theory is as follows:

2.2.1 Traditional theories of trade

The definition of traditional theories is based on Geda (2009). The theory of Absolute Advantage advocates for countries to export commodities which they produce with the least cost of labour (possess absolute advantage) while importing those that they produce with a high cost (absolute disadvantage[15]). Subsequently, the theory of comparative advantage dictates that countries should import commodities that they produce less efficiently (possess comparative disadvantage) and export that which they produce more efficiently (comparative advantage). Comparative advantage is taken as the opportunity cost a country foregoes in producing a specific commodity as opposed to another country even though it possess absolute advantage in all lines of production. The theory

[13] Refer to studies such as Besedes et al., (2006a and b); Besedes et al., (2010);Nitsch (2009); Fugazza et al., (2011) ; Hess et al., (2011,2012); and Arawomo (2015).
[14] This includes theories from Smith's Absolute Advantage to Ricardo's Comparative Advantage and the Hecksher-Ohlin theory to the New Trade Theory
[15] Absolute disadvantage is when a country finds it costly to produce a product with the available level of labour

of factor endowment[16] (Heckscher-Ohlin) states that a country will export a commodity which it is more endowed in and import that which it is less endowed in. It can be seen that all these theories concentrated on explaining the reason countries trade, but failed to address duration of trade.

Vernon's (1966) Product Cycle Theory, which falls under the New Theory of trade, attempts to explain duration of trade but fails to explain short-term spells. It is assumed that trade occurs between a developing (Southern) and a developed (Northern) county. The early stages of trade are dominated by the Northern country as it exports more advanced products to a less developed county. But, with time, the less developed country will adopt technology to the capacity that it starts to re-export to the developed counterpart. This can be seen as an attempt to maintain a relationship between two trading parties. However, this theory fails to explain short-lived relationships that often occur in practice where countries trade for few years (Besedeš et al., 2006b, Nitsch, 2009, Hess et al., 2011, Kamuganga, 2012).

Firm level models by Krugman (1979) and Helpman and Krugman (1985) further allude that differentiated products are likely to survive longer than homogeneous ones. Assuming that varieties of differentiated products are country-specific, consumers in other countries desire them differently. Thus they will have tendencies of starting small but persist over time. Nonetheless just like Vernon's theory, these models also fail to explain short durations of trade.

2.2.2 Duration Theory of Trade

Anchored on explaining how firms in developed countries establish relationships with developing ones, (Rauch and Watson, 2003)[17] developed a Search-Cost model that serves as an ideal basis for

[16] Endowment as explained by Geda (2009) can either be defined in terms of factor prices or according to physical abundance. An illustration of the former can be the cheap price of labour in a country like Kenya as opposed to another country that is more developed. Conversely, physical abundance is related to factor-ratios in that Kenya can be said to be labour endowed if it has a high labour-capital ratio to that of the United States.

[17] Also discussed in (Besedes et al., 2006a;2006b; Brenton et al., 2010; Besedes et al., 2010; Carrere et al., 2012; Fugazza et al., 2011; Kamuganga, 2012 and; Kinuthia, 2014).

export survival theory. This model pegs the life of a trade relationship on three possibilities, search/matching, investment/deepening and rematch/abandoning. The authors recognize that before penetrating new markets, buyers from developed countries look out for suppliers in developing countries. Thereafter a relationship is established though in small quantities as buyers assess suppliers. Hence, the amount of orders will only persist and increase if the supplier meets the requirements of the buyer. However, this relationship will end if the supplier proves unreliable and the buyer will be forced to re-search for another partner.

The major aim of the authors was to show that search costs are very important in forming trade relations which is positively correlated with the initial amount of transactions, and that the inclination to start low value transactions increases with the cost of search and decreases with certainty of the supplier's ability. A model by Bernard, Redding and Schott (2010) though with a similar mindset, digressed from Rauch and Watson's model by noting that increased survival was because of increased demand in the foreign market by consumers which in turn reduces exit. Nitsch (2009) still pointed out that though this search-cost theory was critical in developing survival theory, it failed to explain short relations by, for instance, assuming that buyers will eternally pursue new suppliers in case of failure.

This search-cost model formed the basis of developing the widely cited model of Besedeš and Prusa (2006a, and 2006b). Maintaining focus on product type and initial value of trade like their predecessor, these authors affirm that the initial size of the transaction has a positive effect on the trade duration. Indeed, the larger the starting transaction the longer the years of existence of a relationship. They also predict that even though homogenous products have more transactions than differentiated products in the beginning, they tend to survive less than differentiated ones. Similarly, survival in the starting year improves potential of survival in the coming years.

Theoretic development has also reviewed the effect of fixed costs[18]in trade sustainability whether these costs are sunk costs[19]or are incurred on an annual basis. This approach is developed from the firm-level predictions and can be incorporated in a product-level approach that this study is concerned about. The theory of hysteresis[20] or rather persistence and heterogeneous firm theory[21]postulated that firms would be reluctant to leave foreign markets even if they faced challenges [22]such as exchange rate fluctuations due to high entry costs they had incurred. It is noted that firms have to endure certain fixed and sunk costs in their entry such as distribution costs, establishing networks, branding *inter alia* that make them "fear" to exit and re-experience in other markets. Therefore, this theory alludes to long-lived spells of trade as firms stay resolute in the face of challenges.

At this point, it is critical to note that there are many other factors besides costs that lack clear theoretical backing but have been addressed empirically as it will be seen in the empirical section. Recent theory also advocates for application of discrete-time models as opposed to the widely used continuous-time models in survival studies. The later model was used by Besedeš and Prusa (2006a and b) through the application of Cox proportional hazards model[23]. This model has been noted to face serious econometric problems such as failing to address for unobserved heterogeneity and dealing with tied trade durations. These concerns are not only raised by the Hess and Persson (2012) model that this study seeks to use but also other discrete-time models. Specifically, the Prentice-Gleockner (1978) model used by (Brenton et al., 2010, and Arawomo (2015), Corcoles,

[18] These are costs that must be incurred by a firm even when the output is zero.
[19] These are non-recurrent costs that are incurred by a firm in market even if they leave that market.
[20]Review theories of (Baldwin 1990; Baldwin and Krugman, 1989and; Dixit, 1989).
[21] Review theories of (Meltz, 2003 and; Yeaple, 2005)
[22] Related to good-news principle where only the upside potential keeps a business open and more uncertainty makes the business resolute (Brenton et al., 2012).
[23] A key problem of this model is that given it assumes time to be continuous, it fails to capture the reality that trade relationships are discretely observed in year units.

Diaz-Mora, and Gandoy (2015) model and the Martuscelli and Varela model used in their 2015 working paper.

2.3 EMPIRICAL LITERATURE REVIEW

The seminal study by Besedeš and Prusa (2006a and b) concentrated on testing the Rauch and Watson (2003) model using two US import datasets, the first spanning from 1972 to 1988 (7-digit Tariff Schedule) and the second from 1989 to 2001 (10-digit HS). They found trade relations to be short-lived. The median duration of exporting to the US was 2 to 4 years with about 50% of imports surviving their first year and at most 20% survive to the fifth year. This median duration was even lower in developing countries (slightly below two years) than developed countries[24] which had at least 6 years and half of their relations survived for over ten years[25]. Consistent with theory, their Cox results proved that homogenous products were likely to commence with transactions that were 40% to 350% higher than differentiated ones though they were 23% more likely to die than differentiated products. They also found that maintaining low transportation costs, high GDP, high tariffs and currency-depreciation improved trade survival.

Another influential study by Nitsch (2009) besides confirming the product-specific results of Besedeš and Prusa, positively tested gravity[26] variables on German import data over a decade (1995 – 2005). Standard gravity variables of GDP as a proxy for market size, distance to German and per capita income except for exchange rates robustly confirmed their expectations of reducing hazard rates. Having a common border and a common language was also a significant factor of increasing survival though the membership of German into trade unions like European Union (EU-

[24] Developing countries have been noted as South while developed countries were North as per the authors.
[25] The same results were confirmed by Besedes and Prusa (2011).
[26] Gravity variables are the ingredients of the gravity models which predicts that the amount of trade interactions between countries is proportional to the product of their GDPs and inversely related to the distance between them. These variables have been critical in explaining trade volumes and can therefore be used to explain duration such as market size, transaction cost, exchange rates etc. (Besedes and Blyde, 2010).

15) and EMU-12 were trivial to survival. This suggested a double standard with inclination towards bilateral trade other than trade co-operation or trading blocks. A similar study by Besedeš and Blyde (2010) among 47 exporting and 157 importing Latin America countries[27] between 1975 and 2005 differed with findings of (Nitsch, 2009) on exchange rates and Free Trade agreements. Both factors were found to increase survival with countries that shared a trade agreement having a 7% lower death rate chance than those that were not in a trade agreement. Besides these factors, neighborhood, same language and financial development were also key to export survival. Ad-valorem transport cost as a proxy of infrastructure was also significant on export hazard rates.

Brenton et al. (2010) in their study on 82 exporting[28] countries and 53 importing countries between 1985 and 2005 found exchange rate depreciation of the exporter, regional exporting experience and previous trading relationships increased survival rates. Sharing a common border was slightly positive for low income countries while PTAs between low income countries increased hazards. Notably, this was one of the few studies that used a discrete survival model, Prentice-Gleockner model of 1978.

The aspect of fixed costs in survival was introduced by Fugazza et al. (2011). Testing a Cox Model on a ten year (1995-2004) bilateral trade data of 96 countries including Kenya, they found fixed costs and by extension sunk costs to have an effect on the duration of trade. These authors established that the effect of fixed costs on hazards rate reduced over time as the exporters gained experience. They also emphasized the need for countries to consider exporting to highly competitive markets given that they had a lower hazard rate. This was alluded to the signal that such markets were mature and had high absorption capacity. Differentiated exports generally

[27]Has a median spell of 1 year with only 47% of exports surviving the first year, about 19% survive 5 years and 10% survive 15 years.

[28] 22 of them were SSA countries.

experienced higher survival rates than homogeneous ones. However, this was only applicable in developed countries (North and Emerging South) as homogeneous products survived more in developing south countries. Perhaps this could be due to their comparative advantage and tendencies to specialize in specific products.

The study by Carrère et al. (2012) on export survival in developing countries makes inferences over a 5 digit level SITC data from 1962 to 2010 on OECD imports from 165 non-OECD exporter's[29].First, prior experience with OECD countries was only helpful in the first two years although it generally did not matter where an exporter acquired their experience. Survival was also directly affected by the size and competition of the OECD market as the more the competition, the higher the chances of survival[30]. PTAs with OECD countries would also enhance survival of exports especially from developing countries if the relationship was long-term as countries endured spells of trial and error before settling in the market.

Studies in Africa have also offered vital insights to this discussion. According to Kamuganga, (2012) African exports survived for a median of 1 year. Using HS 6-didit level data from 49 African countries over the period of 1995 to 2009, the author outlined the positive impact of intra-Africa regional trade co-operation. Common markets and custom unions were mainly noted to catalyze survival while PTAs in line with other findings *inter alia* (Brenton et al., 2010) had a negative effect on survival[31]. Their Cox model results also showed that the cost of infrastructure (denoted by costs to export, time to export and procedures to exports) was critical through its positive effect on survival was dependent on improvement. The effect of exchange rate was

[29] 133 of these countries were developing countries with Sub-Saharan Africa having 45.
[30]This showed high demand similar to the inference by Fugazza et al. (2011).
[31] The reason for this negative relationship was due to dysfunctional nature of PTAs which were still under negotiations.

indefinite on export survival as currency depreciation reduced and increased hazards in different countries. Other factors that agreed with theory were, financial development, GDP size, experience in a market, foreign direct investment and quality of export institutions.

Primarily firm-level studies also support many of the product-level empirical findings. Using firm export data from Mali, Malawi, Senegal and Tanzania[32], Cadot et al. (2013) test the determinants of survival beyond the first year. They note that survival was high when firms from a specific country exported homogenous products to the same market[33]. They argued that similar exporters exerted positive externalities on one another besides reducing information asymmetry of a new market. These externalities would also hint to what has been given a wide berth in the subject of export survival in that it increased chances of financial access[34]. Feasibly, it would be easier for a bank to give credit to a firm operating (would like to operate) in a market where there are other firms from the same country. Exporting to a near neighbor also improved survival.

A related study by Mohammed (2011) on Ghanaian Manufacturing firms between 1991 and 1998 agreed with forecasts of gravity variables (firm age, firm size and initial transaction level) but clues to a possibly ignored factor that exports of final products survive less than non-final products. Dissimilarity also came from their finding that geographical proximity did not matter, especially to fellow African countries due to structural challenges such as infrastructure and weak inter-regional integration.

[32]Used HS 10-digit for Mali and Senegal and 8-digit for Malawi and Tanzania. Sample periods were 2005-2008 for Malawi and Mali, 2000-2008 for Senegal, and 2003-2008 for Tanzania.

[33] An example of Senegal was that the probability of survival by a Senegalese firm would increase by fivefold beyond the first year if the number of competitors from the same country selling homogenous products doubled from 22 to 44.

[34] See Jaud et al. (2011) and D'Amato et al., (2015).

Reverting to another flipside of this study is the methodological debate that has seen contemporary studies prefer discrete-time models over continuous-time models. The main nuance rose from the results of Hess and Person (2012) when they tested the results of Besedeš and Prusa (2006 b) with the 1972-1988 7-digit tariff schedule US import data. They first faulted the Cox model for ignoring tied trade durations which lead to incorrect estimations of variables on survival. Comparing the results of a cloglog (complementary log-log) model and those of a Cox model, the coefficients of the former were over 20% large in absolute values to the Cox results[35]. Secondly, using a random effects probit model, they showed that failing to correctly account for unobserved heterogeneity in the Cox model was a serious econometric problem. Their likelihood-ratio tests clearly indicated that unobserved heterogeneity should not be ignored, and they found direct evidence of bias in the estimated survivor function. Thirdly, using several tests, they found that Cox's imposition of individual proportional hazards incorrect even when unobserved heterogeneity was accounted for. Moreover, they found direct evidence that incorrectly imposing proportionality causes bias in the estimated covariate effects[36]. Lastly, discrete-time models could adopt several specification such as probit, pareto hazard, cloglog that have been used in the Hess and Persson study.

This model has been used in recent studies. The first study to empirically test it was Hess and Persson (2011) though on the then working paper of Hess and Persson (2010)[37] on EU-15 import data from 140 non-EU countries including Kenya between 1962 and 2006. They established that EU exports were short-term with a median 1 year. Furthermore, only 40% of these relationships survived past the first year, a third past two years and 90% died in a decade's time. They also

[35] They were expected to have similar results if the Cox model was appropriate
[36] Similar arguments were raised by Martuscelli et al. (2015) in their justification for using their discrete-time model on Georgian firm-level data for 2006 to 2012.
[37] It is what was published as Hess and Persson (2012)

found that parity on export survival was likely to be maintained when one country exported many products to many markets[38], an export relationship started small and grew over time, common language, colonial history, distance, EU membership, prior experience, depreciated exporter exchange rates, differentiated products and high importer GDP. Contrariwise, the exporter's GDP was only positive on survival when a fixed other than random effects model was used. Generally, survival of exports in the 1960s was similar to that of 2000s as LDCs showed a higher incidence of long-term survival than developed partners.

Testing the Hess and Persson (2012) model, Besedeš, (2013) found that the overall effect of NAFTA (North American Free Trade Agreement) on USA, Mexico and Canada was insignificant. The concept of a high exporter GDP resulting to low hazards only suited Canada and USA as contrary results were found in Mexico. This study is credited for distinguishing products in terms of returns to scale[39]. It showed that returns to scale was country specific. For example, exports of increasing-returns-to-scale (IRS) manufacturing products faced the highest hazard in Canada and Mexico, while IRS natural resource products had the highest hazard in Mexico.

Carrère et al. (2014) built on their already discussed 2012 study by reviewing the survival incidence of 114 developing countries in OECD markets between 1962 and 2009. They obtained concurrent results to their 2012 study by not only applying the Cox model but also the Hess et al. (2012) model to control for unobserved heterogeneity[40].

[38]An exporter with over 400 products was 50% likely to survive past the first year while one with 200 products only had a 30% chance. Furthermore, exporting a particular product to ten instead of one country increased chances of survival past the first year by almost twofold (from 33% to 64%).

[39] Three distinctions were made to this effect; constant-returns-to scale, increasing-returns-to-scale manufacturing and increasing-returns-to-scale natural resources.

[40] Araujo et al. (2013) model is also used to control for selection bias. This is a linear model of probability with fixed effects.

This model has also been tested on firm-level data for instance by Stirbat et al. (2013) using monthly level firm export data in Lao PDR from October 2005 to September 2010[41]. Their findings complemented prior findings and theoretical prediction of the positive impact of GDP size, GDP growth and clustering of firms in a market on survival. A significant distinction was established on the place of product and destination experience where the former was more relevant to survival than the second factor. Fugazza and McLaren (2014) also used the same model on Peruvian firms.

To this extent, empirical evidence shows that studies on export survival in Kenya are still limited as only a few studies[42] have included it in their panel. Kinuthia (2014) to the best of my knowledge is the seminal study on survival in Kenya. Using HS 6-digit level bilateral export data from Kenya to 221 countries between 1995 and 2010, Kinuthia (2014) found Kenya's exports to be short-lived. Only a fifth of Kenya's exports survived past the first year and 10% remain resolute to the 13thyear. Kenya's membership to trading blocks of EAC and COMESA remained statistically insignificant. Infrastructure related to trade costs was also found to be important to survival with major emphasis on shipping logistics, cost of exports and time to export. Macroeconomic indicators proxied by financial depth and FDI inflows had a positive effect on survival while appreciated exchange rates reduced survival chances. Market liberalization and all indicators of good governance except corruption also reduced hazard rates. Perhaps astonishing was that the higher the level of corruption, the higher the survival rates in Kenya.

[41] It used data from 1138 firms, 668 HS-6 products and 88 destinations.
[42] Besedes et al. (2006b), Brenton et al. (2009), Fugazza et al. (2011), Kamuganga (2012) and Carrere (2012;2014)

2.4 OVERVIEW OF LITERATURE

Both theory and empirical evidence presented in the preceding sections prove that export survival is a new concept that needs constant development. This is the reason Hess and Persson (2012) formulated a survival model to build on the already existing Cox model. However, empirical evidence shows that the determinants of export survival can be grouped into four major classes. First, Product specific factors, have been salient both in theory and empirics. Whether exports are homogenous or differentiated has been a point of discussion and has offered varied results with regards to the main subject of this paper. Importer specific factors can also be considered as a unique segment and has attracted research attention when considering distance between the trading partners, common border and common language, economic agreements, economic size of both the import market and the exporter measured by GDP, exchange rates, entry costs (fixed and sunk) and, past experience. Exporter specific factors besides all the factors mentioned under the importer section can also be affected by colonial ties, innovation, quality of institutions and, state of financial systems. Besides being outside the scope of this study, firm related attributes can also be outlined as size of the firm, location, number of firms in a market, type of goods produced, foreign capital participation as well as the level of research and development.

This paper makes three empirical additions to the existing literature. Firstly, aside from Kinuthia (2014) and a few other studies which include Kenya in their panel of countries, there are no studies addressing the question of survival in Kenya. Secondly, it reviews underlying factors that have been empirically unclear using Kenyan data *ceteris paribus*, non-reciprocal trade agreements and labour force. Lastly, this study seeks to put into test the econometrically "appropriate" discrete choice model of (Hess and Person, 2012) on Kenyan data. Kinuthia (2014) used the continues-time Cox model.

CHAPTER THREE

3.0 Methodology

This section presents the methodology used in the study and briefly discusses the types, sources and describes how the variables will be measured.

3.1 Econometric Model

As earlier mentioned, this study used the Hess and Persson (2012) discrete-time duration model. This model has been widely preferred by researchers in recent times as there is a move from the previously used continuous-time duration model of Cox (1972). Previous studies preferred combining a Kaplan-Meier model[43] for a description of survival patterns and the Cox (1972) model for explanation of hazard rates in terms of individual variables (Fu and Wu, 2014). The Cox (1972) model is of the form $h(t_i) = h_0(t)exp^{B'X_{it}}$ in that the hazard rate[44] on the left-hand side is a function of two components on the right-hand side. $h_0(t)$ (a baseline hazard function that depends on time and not X) and $exp^{B'X_{it}}$ (an exponential function of a vector of time-varying covariates). X_i is a vector of covariates representing the characteristics of an individual (country in this case), *i,* and β is a vector of coefficients, accounting for the effects of covariates (Besedeš et al., 2010, Kamuganga, 2012). Whereas the covariates are estimated, $h_0(t)$ is not estimated. Thus, the main advantage of the Cox model is that no assumption is made concerning the shape of the hazard model (Besedes et al., 2010, Brenton et al., 2010, Fu et al., 2014). The model is then estimated by

[43] This is a non-parametric model that approximates the survivor function and it is sometimes called the product-limit estimator. It is of the form $\hat{S}(t) = \prod_{i=1}^{t}\left(1 - \frac{k_i}{n_i}\right)$ where $\hat{S}(t)$ is the survival function for a product of several spells up to time t. The ratio in brackets is an estimation of spells which die at time t to the number of spells at risk in time t (Brenton et al., 2012; Besedes et al., 2010).

[44] Note that the hazard rate is taken as the probability that a trade relationship dies after t periods after it has survived up to that point while duration is a sequence of conditional probabilities that a trade relationship continues after t periods given that it has already survived for t periods.

partial likelihood on a log-linear model of the form $log\left[\frac{h(t_i)}{h_0(t)}\right] = \beta' X_{it}$

…….. Equation 1

Hess and Persson (2012) have raised three major arguments against the Cox (1972) model as follows:

i. The Cox model fails to deal with tied durations of trade given time is recorded in yearly intervals. This problem arises from the assumption that duration times can take on any value on the positive real line and the value can be precisely observed. This means that especially in cases of few time intervals or large timelines, there is a tendency of recording trade flows as halting at the same time which increases the number of ties. These ties cause asymptotic biases to occur both in the estimation of the regression coefficients and in the estimation of the corresponding covariance matrix.

ii. The Cox model also fails to account for unobserved heterogeneity which further causes bias in parameters and in the estimated survivor function.

iii. The assumption of proportional hazards of the Cox model means that the effects of covariates on the hazard/death rate are taken as constant across time. This is likely to be unrealistic for the different independent variables used in the model as each one of them has different magnitudes of effect. Hence, there is a likelihood of obtaining misleading estimates of coefficients of covariates if this problem is not corrected.

To be able to estimate the effects of covariates, it is important to specify the function of the hazard rate. We start with a lifetable estimator because it is suited to deal with survival data that is in interval form like the one in this study. Let intervals of time be $d_j = \left(t_j, t_{j+1}\right)$ for j=1,…, J and t_j is the start of the interval while t_{j+1} is the end of interval. Subsequently, let f_j represent the number

of failures observed in interval d_j, c_j represent the number of censored spell endings observed in interval d_j , R_j represnt the number at risk of failure at start of the interval and, r_j as the adjusted number at risk of exit at midpoint of the interval[45] (Jenkins, 2005). r_j is represented as follows:

$$r_j = R_j - \frac{d_j}{2} \quad \text{Equation 2}$$

Therefore the corresponding lifetable estimator survival function is given by:

$$\hat{S}(j) = Pr(T > j) = \prod_{k=1}^{j}\left(1 - \frac{d_k}{r_k}\right) = \prod_{k=1}^{j}(1 - h_k) \quad \text{Equation 3}$$

Where T is the duration of exporting before death of a spell and h_k is the hazard rate in the interval d_j. Estimating equation 3 will answer the first objective of this study on establishing the survival rate of exports from Kenya.

To assess the impact of covariates on the hazard rate, it is critical to specify the hazard model. Hess and Persson (2012) propose four binary regression models i.e. logit, probit, cloglog and Pareto hazard model. However, this study will use the logistic hazard model in equation 4 for ease of analysis.

$$h(x_{ik}) = Pr(T_i < t_{j+1} | T_i > t_j) = \frac{1}{1+exp[-(\beta' x_{ik} + \gamma k + v_i)]} \quad \text{Equation 4}$$

Where x_{ik} is a vector of possibly time-varying explanatory variables and β is a vector of parameters to be estimated. The specific independent variables used in this study are discussed in section 3.2 (including AGOA and labour force). It should be noted that a positive (negative) coefficient indicates a positive (negative) effect on the hazard rate. It consequently has a negative (positive) effect on the survival rate. γk is a baseline hazard rate that is a function of (interval) time that allows the hazard rate to vary across periods. Since the underlying baseline hazard is unknown in practice, γk is incorporated in the model as a set of dummy variables identifying the

[45] This is to take care of relationships that will die before the end of the interval.

duration intervals of each spell. However, a functional form for γk can also be specified in order to reduce the number of parameters in the model. v_i is a Gaussian distribution random effects indicator that deals with the problem of unobserved heterogeneity (frailty).

The hazard rate is interpreted as follows. A small hazard ratio that is less than one, implies greater survival and vice versa. However, it should be noted that this logistic hazard model will also be tested alongside the cox model (equation 1) in order to address the third objective.

The final model for analysis is a log-likelihood function for a binary panel regression of the form[46]:

$$logL = \sum_{i=1}^{n} \sum_{k=1}^{j} [y_{ik}\, log(h_{ik}) + (1 - y_{ik}) log(1 - h_{ik})] \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad \textit{Equation 5}$$

L is an expression of likelihood for the whole sample, in our case countries from i=1,…, n. Small k is time interval in terms of spell from k=1,…, j. y_{ik} is a binary dependent variable, which takes the value 1 if spell *i* is observed to cease during the *k*th time interval, and zero otherwise. h_{ik} is the hazard rate whose functional form has been specified in equation 3.

Interpretation of the results is as follows. A positive coefficient indicates that a particular explanatory variables reduces survival and vice versa. This will answer the second and third objective of this study.

It is also significant to note that as it has been the norm, this study ignores left-censored trade flows but uses right-censored trade flows[47]. This means that instead of using data for 1995, that of 1996

[46] Binary choice models are normally based on maximum likelihood methods (Greene, 2012)
[47] Censoring can either be left, right or interval (Cameron et al., 2005)

is used as the starting year. Conversely, data for 2014 which is our last year is used. Completed spells are recorded as they are. A spell according to this study is the length of time in years it takes to start and end a relationship. If after some time another relationship starts, then it is considered as a second spell and so on. Therefore, many interruptions and restorations indicates increased spells and a low average duration. This hints to another common problem of handling multiple spells. This study adopts the approach of previous studies in handling multiple spells (Besedes et al., 2006a and b, Fugazza et al., 2011, Brenton et al., 2010 and, Fu et al., 2014). This entails merging one year multiple-spell gaps into one continuous spell because it has been noted that their separation leads to measurement errors. Nevertheless, multiple spells are treated as dummy variables.

3.2 Data types, Sources and Description of variables

All datasets used in this study are product level data ranging from 1995 to 2014. Like Carrere et al. (2012), product level data is preferred to firm level data because of unavailability of data at firm level over many years, product level data gives a better global view of a country's export experience and product level data is a better representation of economic development.

The choice of this period is due to data availability of variables that are shown in Table 3. Variables are divided into six major categories starting with trade flow then infrastructure trade cost, macroeconomic performance, institutional, labour force and lastly trade agreements.

Trade flow data is from the World Integrated Trade Solution (WITS) database for 2015. This contains Harmonized System (HS-6 digit) bilateral exports from Kenya to 203 countries[48]. Data for infrastructure trade cost, labour force and macroeconomic performance is obtained from the World Development Indicators (WDI) database of 2015. Worldwide Governance Indicators are

[48] Check Table 8 in the appendix for list of countries

used for the institutional indicators. This study also uses regional measurements i.e. the impact of EAC and COMESA membership on survival. Additionally, AGOA is used to assess the impact of non-reciprocal agreements. All these memberships and agreements are represented as dummies. A proper description of data is shown in Table 3:

Table 3: Variable definition, measurement and source

Variable typology	Variable name	Variable description	Source
Trade flow	Trade flow	HS-6 digit level data 1995-2014	World Integrated Trade Solution (WITS) database (2015)
Cost of infrastructure	Cost to export	US$ per container	World Development Indicators (2015)
	Cost of doing business	Cost of business start-up procedures (% of GNI per capita)	World Development Indicators (2015)
	Liner Shipping Connectivity index	Based on connectivity index (maximum value in 2004 = 100)	World Development Indicators (2015)
	Air transport	Freight (million ton-km)	World Development Indicators (2015)
Macroeconomic performance	FDI inflows	Net inflows (BoP, current US$)	World Development Indicators (2015)
	GDP	GDP for partner countries in US$	World Development Indicators (2015)
	Exchange rate	Official Exchange rates in (US$)	World Development Indicators (2015)
	Financial inclusivity	Domestic credit provided by financial sector (% of GDP)	World Development Indicators (2015)
Institution	Worldwide Governance pointers represented by: government effectiveness, regulatory quality, voice and accountability, rule of law, political stability and absence of violence and control of corruption.	Ranks from -2.5 (weak/poor) to 2.5 (strong)	World Bank database (2014) and Kaufman et al., (2010)

Labour force	Labour force	Total labour force of people aged 15 and above and are economically active. This includes both employed and unemployed but excludes housewives and other unpaid caretakers and informal sector workers	World Development Indicators (2015)
Trade Agreements	EAC	A dummy variable with 1 for an EAC member country and 0 otherwise	Author's computation
	COMESA	A dummy variable with 1 for a COMESA member country and 0 otherwise	Author's computation
	AGOA	A dummy variable with 1 for an AGOA member country and 0 otherwise	Author's computation

Source: Own computation

The flow of trade is represented by product-level data at HS-6 digit level. It is expected that bilateral exports will start small in the first years and increase with time as partners become familiar. This is also in accordance with previous literature where survival is less at the beginning (two to three years) but increases with time as partners consolidate their commercial ties.

It is expected that a high cost of infrastructure increases hazard rates thereby lowering survival. Specific subset variables of cost of infrastructure are, cost to export, cost of doing business, shipping connectivity and air transport in freight. The cost to export involves all necessary documentation and customs fees to facilitate exporting while the cost of doing business entails

registration cost of starting a business. Liner shipping connectivity index shows the incidence of a country's shipping network. It is calculated by the United Nations Conference on Trade and Development (UNCTAD) with 2004 as the benchmark year at 100. Hence, a country with a high incidence will have a value of 100. Lastly, air transport freight indicates the amount of goods carried by air in metric tons times kilometers travelled. This variable is included to supplement countries that are landlocked and might not partake in shipping. An increase in liner shipping connectivity and air transport freight is expected to increase survival of exports.

The next set of variables represents macroeconomic performance. First, a rise in FDI inflows especially one that targets exports is likely to increase export survival. Equally, a rise in Kenya's GDP indicates improved capacity to export hence reduces hazard rates. A depreciation of exchange rates is expected to increase export survival. Financial inclusivity entails domestic credit from the financial sector to various sectors of the economy except the central government. It is expected to increase survival rates.

The third group of variables is on institutions. It is based on a Worldwide Governance Index (Kaufman et al., 2010) which proxies quality of institutions by six pointers, government effectiveness, regulatory quality, voice and accountability, rule of law, control of corruption and political stability and absence of violence. As an estimate, it ranges from -2.5 to 2.5 where -2.5 indicates a weak score (poor performance) while 2.5 indicates a strong/good performance. This study adopts the interpretation of Kinuthia (2014) by noting that better governance increases survival.

The fourth set of variables is labour force. It is composed of an active labour force that is either employed or unemployed and is above 14 years old. As a requirement by the International Labour Organization (ILO), this group excludes informal sector workers, housewives and other unpaid caretakers. Labour force is expected to increase survival of exports.

The last set of variables indicates the impact of membership and agreements on survival. It is expected that both membership into EAC, COMESA and being privy to AGOA increases export survival.

CHAPTER FOUR

4.0 Introduction

This section contains empirical results in line with equations in Chapter Three and a discussion of the same results. The section starts with a description of the data used followed by survival and hazard results and lastly results of the logistic regression model with covariates.

4.1 Summary Statistics of Covariates

This study uses annul country-period data between 1995 and 2014. The main variables divided into five groups and they include: cost of infrastructure (liner shipping connectivity, air transportation network, cost of export and cost of starting a business), macroeconomic stability (GDP, exchange rates and financial inclusivity and FDI inflows): institutions (government effectiveness, regulatory quality, voice and accountability, rule of law, political stability and absence of violence and control of corruption), labour force and, agreements (EAC, COMESA and AGOA). Data for the first, second and fourth variables was obtained from the World Development Indicators data base of 2015. The data for institutions was obtained from the World Governance Indicators data base (Kaufman et al., 2010) while data for agreements was computed by the author. Table 4 summarizes data in mean, standard deviation, minimum and maximum for all the 203 countries included in the study.

Results in Table 4 show that the mean air transport between 1995 and 2014 is US$687.69 with a standard deviation of US$2,774.63 and a minimum of US$0 and a maximum of US$33,241. Countries with developed air transport network in North America, Europe and Asia had the highest scores. The average cost of doing business is 49% of GNI per capita with a standard deviation of 89%. Developed countries posted the least cost with the minimum being 0% while SSA countries

posted some of the highest scores with the maximum being 787%. The mean cost of exporting is US$1,234.76 per container with a standard deviation of US$918.36, a minimum of US$0 and a maximum of US$5,640.Similar to cost of doing business, exporting was mainly expensive among SSA countries. Developed countries have the highest amount of domestic credit provided by financial sector (% of GDP) as expected. The average domestic credit provided by financial sector (% of GDP) is 53% with a standard deviation of 53% and a minimum and maximum of -32% and 314% respectively.

Table 4: Summary statistics of key explanatory variables

Variable	Mean	Standard Deviation	Minimum	Maximum
Air transport (freight millions to Km)	687.69	2,774.63	0	33,241
Cost of doing business	48.71	88.88	0	787
Cost to export	1,234.76	918.36	0	5640
Financial inclusivity	53.27	52.80	-32	314
FDI inflows	6.71e+09	2.18e+10	-4.99e+08	1.96e+11
GDP	2.40e+11	1.02e+12	22,271,805	1.25e+13
Labour force	1.45e+07	6.27e+07	39,079	7.50e+08
Liner Shipping Connectivity index	15.77	22.89	0	136
Exchange rate	582.42	2,101.85	0.3	16,831
Voice and Accountability	-0.037	0.97	-2.17	1.62
Political stability	-0.042	0.91	-2.8	1.47
Government effectiveness	-0.037	0.95	-2.2	2.15
Regulatory quality	-0.044	0.95	-2.39	1.94
Rule of Law	-0.047	0.95	-2.36	1.95
Control of Corruption	-0.033	0.95	-1.71	2.43

Source: Own computation

Developed countries such as USA and China posted the highest GDP and FDI inflows. The average FDI inflow is US$6.71 Billion with a standard deviation of US$21.8 Billion and a respective minimum and maximum of US$-499 Million and US$196 Billion. Equally, the mean GDP is US$240 Billion with a standard deviation of US$1.02 Trillion and a respective minimum and maximum of US$22 Million and US$12.5 Trillion.

The mean labour force is 14.5 Million with highly populated countries such as China and India producing the bulk. The standard deviation was 62.7 Million, a minimum and maximum of 39,079 and 750 Million respectively. The mean Liner connectivity index was 15.77 with a standard deviation of 22.90 and a minimum and maximum of 0 and 136. As expected, landlocked countries posted zero scores. The mean official exchange rate was US$582 with a standard deviation of US$2101 with a minimum of US$0.3 and a maximum of US$16,831.

Nordic countries i.e. Iceland, Sweden, Finland, Denmark and Norway posted highest scores of strong institutions while war-prone countries in SSA and Middle-East posted the lowest scores. The mean estimate of Voice and Accountability was weak at -0.037 with a standard deviation of 0.97 and a minimum of -2.17 and a maximum of 1.62. Equally, the average political instability is weak at -0.042 with a standard deviation of 0.91 and a respective minimum and maximum of -2.8 and a maximum of 1.47. The mean governance effectiveness is also weak at -0.037 with a standard deviation of 0.95 and a minimum and maximum of -2.2 and 2.15 respectively. Similarly, the mean regulatory quality is weak at -0.04 with a standard deviation of 0.95 and a respective minimum and maximum of -2.39 and 1.94. The average rule of law is modest at -0.05 with a standard deviation of 0.95 and a minimum of -2.36 and a maximum of 1.95 respectively. Lastly, the mean control of corruption is -0.03 with a standard deviation of 0.95 and a respective minimum and maximum of -1.71 and 2.43.

4.2 Empirical results

The first objective of this study was to examine incidence of survival of exports from Kenya. Results from the survival function in equation 3 show that survival is low in Kenya and equally hazard results from equation 4 indicate high failure rates. According to Table 5, the hazard rate in the first year is 64% and it increases to 90% in the fourth year. Hence, this indicates that only about 10% of exports from Kenya still exists after 4 years and less than 1% exist by the sixteenth year. These results are further substantiated by a median survival period of 1 year for Kenyan exports.

Table 5: Results for hazard and survival rates

Percent		
Interval	Hazard rate	Survival rate (1-hazard rate)
1	64	36
2	71	29
2	86	14
3	89	11
4	90	10
5	93	7
6	94	6
7	95	5
8	94	4
9	96.2	3.80
10	96.93	3.07
11	97.58	2.42
12	98.23	1.77
13	98.83	1.17
14	99.42	0.58
15	99.43	0.57
16	99.44	0.56

Source: Own computation

A discrete-time logistic log-likelihood model accounting for frailty and proportional hazards[49] is run to address the second objective. Results of the effects of labour force, AGOA and other covariates on the hazard rate is represented in Table 6 and Table 7 basing on different specifications.

Table 6: Regression results for export duration in Kenya

Dependent variable: Hazard rates			
	Model 1	Model 2	Model 3
Log (t)	13.58501***	13.30371***	13.57854***
	(0.000)	(0.000)	(0.000)
Air transport (freight	-0.000043 ***	-0.0001117 ***	-0.0000844***
millions to Km)	(0.000)	(0.000)	(0.000)
Cost of doing business	-0.006169 ***	-0.0025212***	-0.0054302***
	(0.000)	(0.000)	(0.000)
Cost to export	0.0009059***	0.0009209***	-0.0008287 ***
	(0.000)	(0.000)	(0.000)
Liner Shipping	-0.07129**	-0.2158 **	-0.07477**
Connectivity	(0.049)	(0.05)	(0.04)
Financial inclusivity		-0.01516***	-0.003714 *
		(0.000)	(0.963)
FDI inflows		0.386**	0.160**
		(0.048)	(0.03)
GDP		-0.094**	-0.058**
		(0.612)	(0.788)
Exchange rate		-0.0000189*	-0.0000421***
		(0.000)	(0.000)
Voice and			-0.1772503*
Accountability			(0.523)
Political stability			-0.3800961*

[49] This is according to equation 5 in Chapter Three

			(0.097)
Government effectiveness			-0.3576955*** (0.001)
Regulatory quality			0.8881907*** (0.108)
Rule of Law			-1.880168** (0.018)
Control of Corruption			0.6242981* (0.001)
Observations	7936	6558	6558
Log likelihood	-4004.2857	-3181.0278	-3130.232
P-value	0.0000	0.0000	0.0000

Source: Own computation

The dependent variable is the hazard rate. Coefficients are not recorded in parenthesis. A positive sign on the coefficient indicates an increase in the hazard rate (failure of an export relationship) while a negative coefficient signifies an increase in survival of an export relationship. The p-value statistic value are indicated in parenthesis and they are compared with the critical values to make an inference. Stars indicate level of statistical significance: *** significant at 1%, ** significant at 5% and * significant at 10% (***p<0.01, **p<0.05 and *p<0.1). Log (t) is the logarithm of time and is advisable in person-period discrete data sets like in our case (Jenkins, 2008, Fu et al., 2014).

Model 1 contains results of the effect of cost of infrastructure on the hazard rates. The air transportation coefficient is negative and significant at 1% level, indicating that increasing air transportation reduces hazard rates. The cost of doing business and the cost of exporting are significant with different signs. The former has a negative coefficient indicating that a unit increase in the cost of doing business reduces failure while the latter indicates that a unit increase in cost to

export increases failure rates. It is only the cost of exporting that conforms to theoretical predictions. The liner shipping connectivity index is negative and significant indicating that a unit increase in liner shipping connectivity increases survival of Kenyan exports. In general, model 1 is significant as the p-value of the likelihood ratio.

Model 2 adds indicators of macroeconomic performance to the cost of infrastructure. All previous indicators of the cost of infrastructure remain significant. A unit increase in financial inclusivity increases survival rate and it is significant at 1% level. This indicates the importance of access to credit by exporters. FDI inflows contrary to expectations increases hazard rates and it is significant at 5% level. A similar result was found by Kamuganga (2012). An increase in GDP and exchange rates increases survival rates although GDP is not significant at all levels. The results of exchange rates indicates that a depreciation of currency increases survival of Kenyan exports which is contrary to findings by Kinuthia (2014). . In general, model 2 is significant as the p-value of the likelihood ratio.

Model 3 adds institutions to cost of infrastructure and macroeconomic performance. An increase in voice and accountability, political stability, governance effectiveness and rule of law decrease failure rates of export relationships in Kenya. Furthermore, only political stability, rule of law and governance effectiveness remain significant at 10%, 5% and 1% levels respectively. An increase in regulatory quality and control of corruption increase hazard rates although only control of corruption is significant at 1% level. These results are contrary to expectation but the inference on corruption is similar to what Kinuthia (2014) found out. . In general, model 3 is significant as the p-value of the likelihood ratio.

Table 7: Estimates of the discrete-model (continuation)

Dependent variable: Hazard rates		
	Model 4	Model 5
Log (t)	13.96366***	14.22864***
	(0.000)	(0.000)
Air transport (freight millions	-0.0001177***	-0.0001228***
to Km)	(0.000)	(0.000)
Cost of doing business	-0.0051674***	-0.0057245***
	(0.135)	(0.000)
Cost to export	0.0007739***	0.0007929***
	(0.000)	(0.000)
Liner Shipping Connectivity	0.0347726***	.0359713***
	(0.000)	(0.000)
Financial inclusivity	-0.0045168**	-0.0045125**
	(0.05)	(0.05)
FDI inflows	0.102**	0.135**
	(0.03)	(0.02)
GDP	-0.053**	-0.099**
	(0.806)	(0.654)
Exchange rate	-0.0000458***	-0.0000622***
	(0.000)	(0.000)
Voice and Accountability	-0.1738844*	-0.2770201*
	(0.534)	(0.328)
Political stability	-0.398709*	-0.612415**
	(0.088)	(0.021)
Government effectiveness	-0.1458245***	-0.8957337***
	(0.000)	(0.000)
Regulatory quality	0.8064449***	0.8795058***
	(0.184)	(0.139)
Rule of Law	-1.919991**	-1.821977**

	(0.018)	(0.025)
Control of Corruption	0.5061821*	0.61922*
	(0.001)	(0.000)
Labour force	-0.000281***	-0.546***
	(0.000)	(0.061)
EAC		-0.3320677**
		(0.007)
COMESA		-0.808428*
		(0.264)
AGOA		-1.039242**
		(0.025)
Observations	6421	6421
Log likelihood	-3034.6267	-188.52872

Source: Own computation

The dependent variable is the hazard rate. Coefficients are not recorded in parenthesis. A positive sign on the coefficient indicates an increase in the hazard rate (failure of an export relationship) while a negative coefficient signifies an increase in survival of an export relationship. The p-value statistic value are indicated in parenthesis and they are compared with the critical values to make an inference. Stars indicate level of statistical significance: *** significant at 1%, ** significant at 5% and * significant at 10% (***p<0.01, **p<0.05 and *p<0.1). Log (t) is the logarithm of time and is advisable in person-period discrete data sets like in our case (Jenkins, 2008, Fu et al., 2014).

Model 4 introduces labour force to the cost of infrastructure, macroeconomic performance and institutions. The signs and significance of the last three indicators remain the same, except for the liner shipping which becomes positive and significant at 1% level. Labour force is shown to have a positive impact on hazards in that an increase in labour force increases failure rates.

Model 5 incorporates trade agreements over the cost of infrastructure, macroeconomic performance, institutions and labour force. Among the previous variables, the sign of labour force changes to negative indicating that an increase in labour force increase survival of Kenyan exports. All coefficients of trade agreements are negative indicating that EAC, COMESA and AGOA all increase survival of exports from Kenya. However, only membership into EAC and AGOA are significant. The insignificance of COMESA can be attributed to the weak intra-Africa trade and slow implementation of regional trade agreements leading under-exploitation of opportunities (Kinuthia, 2014). The positive sign on AGOA indicates the potential of non-reciprocal preferential trade agreements to spur growth of exports.

CHAPTER FIVE

5.0 Summary

The main objective of this study was to establish the main determinants of export durations in Kenya. The study also sought to investigate the impact of labour force and non-reciprocal trade agreements, having established that these two factors had been scantly covered by other studies. These objectives were subsequently complimented by two major research questions: how long Kenyan exports survive and, how non-reciprocal trade agreements and labour force influence duration of Kenyan exports. These questions would then inform how export duration can be lengthened in Kenya.

The study used annual HS-6 digit product export data from Kenya to 203 partners between 1995 and 2014. This data was first right-censored to facilitate the determination of survival rates and hazard rates using a discrete-time logistic regression model. Covariates were later introduced in the hazard model to determine their effects on export duration. The dependent variable was a binary variable of whether Kenya exported or not in a specific year. Consequently, covariates were divided into four major groups: cost of infrastructure (liner shipping connectivity, air transportation network, cost of export and cost of starting a business), macroeconomic stability (GDP, exchange rates and financial inclusivity and FDI inflows): institutions (government effectiveness, regulatory quality, voice and accountability, rule of law, political stability and absence of violence and control of corruption), labour force and, agreements (EAC, COMESA and AGOA).

5.1 Conclusion

The results affirm other findings that trade durations are brief. The median duration of Kenyan exports is one year with 64% of exports failing within the first year and less than one percent exist by the sixteenth year.

The study also shows five main findings with regards to the effects of covariates on export survival. Foremost, the cost of infrastructure is still critical on export survival. Improvement of both air transportation networks and liner shipping is critical in improving time to export besides reducing the cost of exporting. Secondly, there is need to maintain macroeconomic soundness by mainly, increasing GDP, managing exchange rates and increasing financial inclusivity through providing domestic credit from the financial sector. In particular, there is need for provision of/increased access to domestic credit to ease trade penetration by firms. Thirdly, there is need to maintain voice and accountability, political stability, government effectiveness and rule of law. However, the control of corruption and maintaining regulatory quality have negatively impacted survival in Kenya. Fourthly, adding labour force improves export survival. Lastly, only membership to EAC and AGOA have improved survival of Kenyan exports as membership in COMESA remains insignificant.

5.2 Policy recommendations

The findings in this study have important policy recommendations to the Government of Kenya, exporters and other policy makers as follows. First, there is need to improve both air and shipping infrastructure to reduce the cost of trading and exporting thereby improving survival of exports.

Policies should also be geared towards increasing the level of GDP, increasing provision of credit to exporters and controlling exchange rates. Maintaining good institutions/governance, increasing skilled labour force and pursuing membership in non-reciprocal preferential agreements such as AGOA increases export survival.

5.3 Areas of further research

Finally, I acknowledge the major limitations of this study which should be improved by future studies. This study is based on secondary data which might have some inaccuracy. It will be vital for future research to consider primary data. Secondly, this study uses product-level data which might also have some inaccuracies. Literature that has used firm-level data has been able to address important factors like innovation, access to credit and insurance on export survival. Firm-level data will also aid in demarcating skilled and unskilled labour based on level of education and years of experience, something that is constrained by product level-data. Lastly, there is need to consider survival of service exports.

REFERENCES

Araujo L., Mion, G., and Ornelas, E. (2013). *Institutions and Export Dynamics.* Mimeo.

Arawomo, D.F. (2015). Survival of Nigeria's Exports in Her Biggest Markets: Continuous and Discrete Time Estimations. *Economics Bulletin*, *35*(3), 1700-1708.

Baldwin, R., and Krugman, P. (1989). Persistent Trade Effects of Large Exchange Rate Shocks. *The Quarterly Journal of Economics*, 104 (4), 635-654.

Baldwin, R. (1990). Hysteresis in Trade. *Empirical Economics*, *15* (2), 127 - 142.

Bernard, A.B., Redding, S.J., and Schott, P.K. (2010). Multi-product firms and product switching.*American Economic Review*, 100(1), 70–97.

Besedeš, T., and Blyde, J. (2010). *What drives export survival? An analysis of export duration in Latin America.* Retrieved from www.editorialexpress. Com/cgi-bin/conference/download. cgi.

Besedeš, T. and Prusa, T. J. (2006a). Ins, Outs, and the Duration of Trade. *The Canadian Journal of Economics, 39*(1), 266-295.

Besedeš, T., and Prusa, T. J. (2011). The role of extensive and intensive margins and export growth. *Journal of Development Economics*, *96*(2), 371-379.

Besedeš, T., and Prusa, T. J. (2006b). Product differentiation and duration of US import trade. *Journal of International Economics*, *70*(2), 339-358.

Besedeš, T. (2013). The Role of NAFTA and Returns to Scale in Export Duration. *CESifo Economic Studies*, *59*(2), 306–336.

Brenton, P., Cadot, O., and Pierola, M. D. (2012). *Pathways to African Export Sustainability*. 1818 H Street NW, Washington, DC 20433, US: World Bank Publications.

Brenton, P., Pierola, M.D., and von Uexkull, E. (2009). The Life and Death of Trade Flows: Understanding the Survival Rates of Developing-Country Exporters. N. Richard, S. William and W. Peter (Eds.), *Breaking into New Markets: Emerging Lessons for Export Diversification*. Washington, DC: World Bank.

Brenton, P., Saborowski, C., and von Uexkull, E. (2010). What explains the low survival rate of developing country export flows? *World Bank Economic Review*, *24*(3), 474–499.

Cadot, O., Iacovone, L., Pierola, M. D., and Rauch, F. (2013). Success and failure of African exporters. *Journal of Development Economics*, *10* (1), 284-296.

Cameron, A. C., and Trivedi, P. K. (2005). *Microeconometrics: Methods and Applications*. 32 Avenue of the Americas, New York, USA: Cambridge university press.

Carrère, C., and Strauss-Kahn, V. (2012). *Exports Dynamics: Raising Developing Countries Exports Survival through Experience*. FERDI, Working Paper, P35-A.

Carrère, C., and Strauss-Kahn, V. (2014). *Developing Countries Exports Survival in the OECD: Does Experience Matter?* FERDI, Working Paper 100.

Condon, N., and Stern, M. (2011). *The effectiveness of African Growth and Opportunity Act (AGOA) in increasing trade from Least Developed Countries.* London: EPPI Centre, Social Science Research Unit, Institute of Education, University of London.

Córcoles, D., Díaz-Mora, C., and Gandoy, R. (2015). *Export Survival in Global Production Chains*. The World Economy. Doi: 10.1111/twec.12249.

Cox, D. R. (1972). Regression models and life-tables. *Journal of the Royal Statistical Society. Series B (Methodological)*, *34* (2), 187-220.

Dixit, A. (1989). Entry and Exit Decisions under Uncertainty. *Journal of Political Economy*, 97(3), 620-38.

Fu, D., and Wu, Y. (2014). Export survival pattern and its determinants: an empirical study of Chinese manufacturing firms. *Asian-Pacific Economic Literature*, *28*(1), 161-177.

Fugazza, M. and McLaren, A. (2014). Market Access, Export Performance and Survival: Evidence from Peruvian Firms. *Review of International Economics*, *22*(3), 599–624

Fugazza, M., and Molina, A.C. (2011). *On the Determinants of Exports Survival.* Working Paper no.311 (Geneva: FREIT).

Fugazza, M. (2004). *Export performance and its determinants: Supply and demand constraints. Policy Issues in International Trade and Commodities Study Series.No.26.* UNCTAD, New York and Geneva.

Geda, A. (2009). *Fundamentals of International Economics for Developing Countries: A Focus on Africa, Volume I: Trade Theory and Policy.* Africa Economic Research Consortium, Nairobi, Kenya.

Helpman, E., and Krugman, P. R. (1985). *Market structure and foreign trade: Increasing returns, imperfect competition, and the international economy*. MIT press.

Hess, W., and Persson, M. (2012). The duration of trade revisited. *Empirical Economics*, *43*(3), 1083-1107.

Hess, W. (2009). *A flexible hazard rate model for grouped duration data*, Working Paper No. 2009:18. Department of Economics, Lund University.

Hess, W., and Persson, M. (2011). Exploring the duration of EU imports. *Review of World Economics*, *147*(4), 665-692

Jaud, M., and Kukenova, M. (2011). *Financial development and survival of African agri-food exports*. World Bank Policy Research Working Paper Series.

Jenkins, S.P. (2005). *Survival Analysis* (The Lecture Notes Manuscript).

Jenkins, S.P. (2008). *Lesson 3. Preparing survival time data for analysis and estimation*.

Kamuganga, D. N. (2012). *Does intra-Africa regional trade cooperation enhance Africa's export survival?* (No. 16/2012). Graduate Institute of International and Development Studies Working Paper.

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2011). The worldwide governance indicators: methodology and analytical issues. *Hague Journal on the Rule of Law*, *3*(2), 220-246.

Kinuthia, B.K. (2014). *Export Duration and Determinants of Exports Survival in Kenya. Trade Discourse in Kenya*: Some Topical Issues Volume 2, Nairobi, Kenya.

Krugman, P. R. (1979). Increasing returns, monopolistic competition, and international trade. *Journal of international Economics*, *9*(4), 469-479.

Krugman, P., Cooper, R. N. and Srinivasan, T. N. (1995). Growing world trade: causes and consequences. *Brookings papers on economic activity*, *1*(25), 327-377.

Majeed, T.M., and Ahmad, E. (2006). Determinants of exports in developing countries. *The Pakistan Development Review*, *45*(4), 1265-1276.

Martuscelli, A., and Varela, G. J. (2015). *Survival is for the fittest: export survival patterns in Georgia*. World Bank Policy Research Working Paper 7161.

Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica, 71*(6), 1695–1725.

Mohammed, A.A. (2011). *Determinants of Export Survival: The case of Ghanaian Manufacturers.* Working Paper, UNU-MERIT.

Nitsch, V. (2009). Die another day: Duration in German import trade. *Review of World Economics*, *145*(1), 133-154.

Prentice, R. L., and Gloeckler, L. A. (1978). Regression analysis of grouped survival data with application to breast cancer data. *Biometrics*, *34*(1), 57-67.

Rauch, J. E., and Watson, J. (2003). Starting small in an unfamiliar environment. *International Journal of Industrial Organization*, *21*(7), 1021-1042.

Republic of Kenya. (2015). *International Trade Policy*. Government Printers.

Stirbat, L., Record, R., and Nghardsaysone, K. (2013). *Determinants of export survival in the Lao PDR.* World Bank Policy Research Working Paper 6301.

UNCTAD. (2005). *Determinants of exports performance.* Available at http://unctad.org/en/docs/ditctab20051ch2_en.pdf.

Were, M. (2011). Is There a Link Between Casual Employment and Export-Orientation of Firms? The Case of Kenya's Manufacturing Sector. *The Review of Black Political Economy*, *38*(3), 227-242.

World Bank. (2013). *Achieving shared prosperity in Kenya.* Washington DC: World Bank

Yeaple, R.S. (2005). A Simple Model of Firm Heterogeneity, International Trade, and Wages. *Journal of International Economics*, *65*(1), 1–20.

APPENDIX

Table 8: List of countries

Afghanistan, Albania, Algeria, American Samoa, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia ,Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, Central African Rep., Chad, Chile, China, China, Hong Kong SAR, China, Macao SAR, Colombia, Comoros, Congo, Costa Rica, Côte d'Ivoire, Croatia, Cuba, Cyprus, Czech Rep., Dem. People's Rep. of Korea, Dem. Rep. of the Congo, Denmark, Djibouti, Dominica, Dominican Rep., Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Faeroe Islands, Fiji, Finland, France, FS Micronesia, Gabon, French Polynesia, ,Gambia, Georgia, Germany, Ghana, Greece, Grenada, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kiribati, Kuwait, Kyrgyzstan, Lao People's Dem. Rep., Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Mongolia, Montserrat, Morocco, Mozambique, Myanmar, N. Mariana Islands, Namibia, Nepal, Nauru, Netherlands, New Caledonia, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New ,Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Rep. of Korea, Rep. of Moldova, Romania, Russian Federation, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Serbia and Montenegro, Seychelles, Sierra Leone,

Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syria, Tajikistan, TFYR of Macedonia, Thailand, Timor-Leste, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Turks and Caicos Islands, Tuvalu, Uganda, Ukraine, United Arab Emirates, United Kingdom, United Rep. of Tanzania, Uruguay, US Misc. Pacific Islands, USA, Uzbekistan, Vanuatu, Venezuela, Viet Nam, Yemen, Zambia, Zimbabwe

Source: Own computation

Table 9: EAC and COMESA membership

EAC	**COMESA**	
Burundi	Burundi	Mauritius
Kenya	Comoros	Seychelles
Rwanda	Dem. Rep. of the Congo	Sudan
Tanzania	Djibouti	Malawi
Uganda	Egypt	Rwanda
	Eritrea	Uganda
	Ethiopia	Swaziland
	Kenya	Zambia
	Libya	Zimbabwe
	Madagascar	

Source:h*ttp://www.eac.int/index.php?option=com_content&view=article&id=1&Itemid=53 and http://about.comesa.int/index.php?option=com_content&view=article&id=123&Itemid=121* (Accessed 17th November, 2015)

Table 10: AGOA membership

Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Chad, Comoros, Republic of Congo, Cote d'Ivoire, Djibouti, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Zambia

Source: http://trade.gov/agoa/eligibility/index.asp (Accessed 16th November, 2015)