Antecedents to the AfCFTA: Lessons from Kenya's export survival under COMESA

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Abstract

Policy discourse on intra-African trade is currently dominated by discussions on the potential benefits of the African Continental Free Trade Area (AfCFTA). This study contributes to this discussion by drawing lessons from the current levels of export survival under the Common Market for Eastern and Southern Africa (COMESA) and Economic Integration Agreements (EIAs) in Africa since AfCFTA seeks to collapse many African trade agreements into one. Using monthly firm-product-destination customs transaction data from Kenya for over 144 months (January, 2006 to December, 2017), we investigate how the experience of trading under an agreement affects the export survival of firms in 52 African countries and 20 COMESA countries. We find that exporting under a trade agreement improves duration of exporting as opposed to trading under no agreement. About 70% of export firms survive beyond the 1st month of exporting to COMESA countries. A half of them survive beyond the 12th month and less than 10% live beyond the 108th month. Results from the probit model with random effects indicate that EIAs significantly enhance export survival in African countries. However, trading under COMESA significantly reduces export survival in COMESA markets. For purposes of policy, negotiations and implementation of AfCFTA protocols on trade in goods should be enhanced. For COMESA, there is need to improve policy incentives to make it a deeper EIA thereby improving survival of exports. Other interventions include improving transport and logistics infrastructure and facilitating trade.

JEL Classification: F14, F15, C35, C41
Key words: Export survival, Export duration, Discrete-time models, Economic Integration Agreements

1.1 Introduction

The African Continental Free Trade Area (AfCFTA) is perhaps the sole biggest existing priority trade policy of many African governments with regards to intra-Africa trade. The main purpose of the agreement is to create a single market for goods and services among 55 members of the African Union. It is premised on recommendations of the 18th Ordinary Session of the Assembly of Heads of State and Government of the African Union in 2012. However, it was until 21st March 2018 that countries became active. By the end of January 2020, 54 and 29 countries had signed, and ratified the agreement respectively (Abrego et al., 2020).

Trading under AfCFTA was to start on 1st July 2020 but it has been deferred to 1st January 2021 due to the ongoing Coronavirus pandemic (TRALAC, 2020a). Nonetheless, AfCFTA's implementation is done in phases. Trade in goods and trade in services are being negotiated under Phase 1 with negotiations on pertinent issues on rules of origin for goods, tarriff concessions and service shedules of special commitments still ongoing. Phase 2 negotiations on Competition policies, investmest and intellectual property rights protocols are likely to be completed by December 2020 (TRALAC, 2020b).

Assessing potential benefits of the agreement is at the center-stage of policy makers and scholars, which is often done using Computable General Equilibrium (CGE) models (Valensisi et al., 2016; Abrego et al., 2019; World Bank, 2020) and gravity models (Geda and Yimer, 2019; Mukwaya, 2019). In this study, we project the effect of this agreement by drawing lessons from current levels of export survival across various Economic Integration Agreements in Africa. Particularly Common Market for Eastern and Southern Africa (COMESA) agreement. The intention is to simulate the merit or demerit of integrating into one trading block since AfCFTA converges several trade agreements. Ideally, agreements are expected to boost survival of exporters by reducing entry and operation costs (Besedes et al., 2016; Blyde et al., 2015).

This exercise is done using a case study of an African country (Kenya) which is one of the top exporters in the region but has suffered from episodes of low export growth in recent years despite pursuing several trade agreements (Majune, Moyi and Kamau, 2020). Kenya was the 11th exporter in Africa between 2006 and 2017 (see Figure 1). It has also featured among the top 7 and top 4 exporters of manufactured and agricultural products respectively in the region. However, the growth of total exports between 2006 and 2017 was below 10% and it grew by -6.16% in 2017 (see Figure 1). Kenya's export survival rate is also low. Between 20% and 52% of new export

relationships from Kenya die in their first year of trading with 90% failing by the 13th year (Kinuthia, 2014; Chacha and Edwards, 2017, Majune et al., 2020).

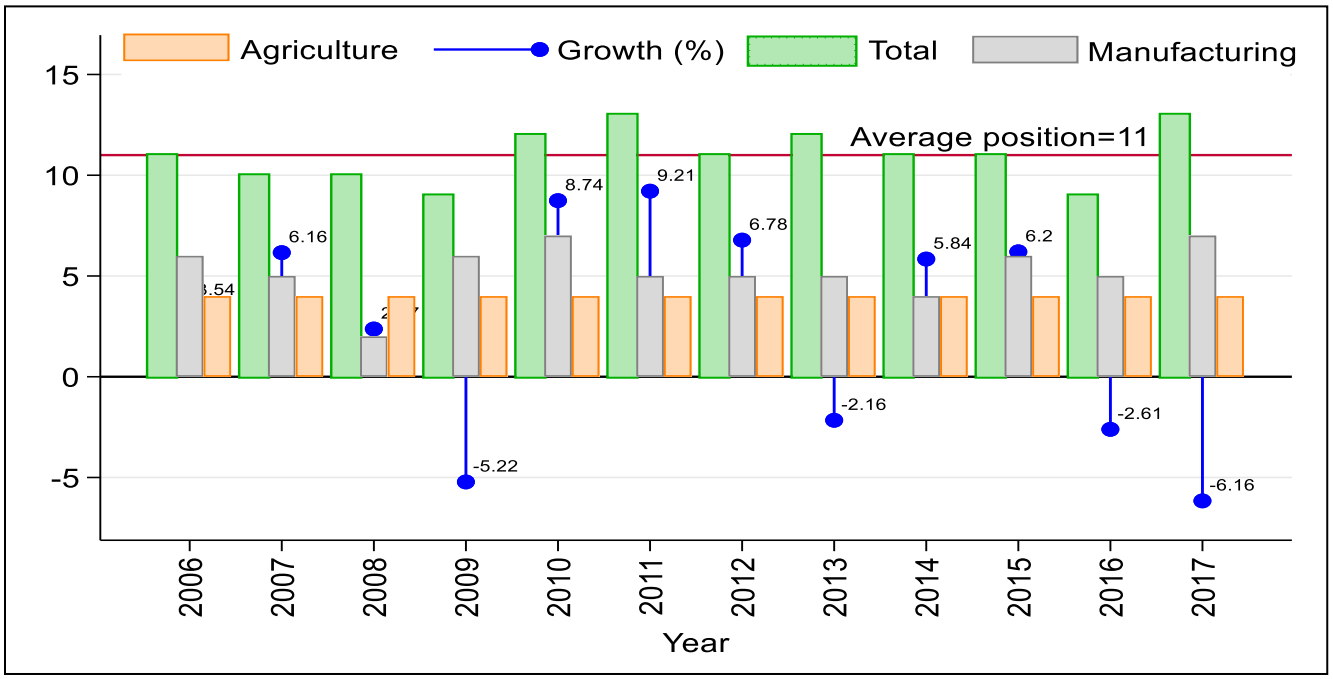

Figure 1: Export growth and export rank of Kenya (total, manufacturing and agriculture) in SSA, 2006-2017

Source: Authors' own computations using WITS Data.

Another motivation of conducting this study in Kenya is the availability of a rich product-destination-monthly-level customs transaction data that is seldom used in duration literature. Except Sabuhoro et al. (2006), Tovar and Martinez (2011) and Stirbat et al. (2015), most duration studies use annual data. According to Bernard et al. (2017) and Geishecker, Schröder and Sørensen (2019), the use of annual data has two problems. Firstly, it causes partial-year effect biases and, lastly, it misreports one-off export events. Partial-year effects biases arise from overstatement or understatement of export levels and export growth of new exporters in a year. For instance, first year Peruvian export levels are understated by 54% while the first year export growth rate are overstated by 112% when annual other than monthly customs-transactions data is used (Bernard et al., 2017). One-off export events are short export spells that often last for a month when a firm temporary exports. This could be for purposes of clearing their stocks or to "test the waters" of foreign markets. In Denmark, 17% of export sales are single-month one-off events (Geishecker, Schröder and Sørensen, 2019). However, such problems can be overcome by monthly data.

The use of monthly data also solves the problem of missing data in Kenya. The country lacks export records for 2011, 2012 and 2013 in popular trade data sets like World Integrated Trade Solution (WITS) and UNComtrade (Fernandes et al., 2019). This has forced researchers to use import records as mirror data (Brenton, Saborowski and Uexkull, 2010; Fernandes et al., 2019). Finally, it is possible to accurately match trade agreements to their respective months of incorporation. This is often approximated in studies using annual data.

1.2 Problem Statement

Kenya has sought export promotion policies including entering into bilateral and multilateral agreements. Since liberalization in 1993 (Wacziarg and Welch, 2008), the country has signed over thirty six bilateral trade agreements alongside joining two FTAs (Nyaga, 2015; ROK, 2017). It also signed and ratified the AfCFTA earlier than most countries (Abrego et al., 2020). In spite of these export promotion strategies, Kenya's export growth has remained low (see Figure 1).

To boost growth of exports, the country can identify policies that enhance export survival. That is, the likelihood of an existing trade relationship remaining active over time. One avenue is through trade agreements since they reduce market entry barriers. The advent of the AfCFTA promises to expand the market for Kenya's products in Africa. CGE (Valensisi et al., 2016; Abrego et al., 2019; World Bank, 2020) and gravity models (Geda and Yimer, 2019; Mukwaya, 2019) forecast a positive impact of the agreement on trade. However, it is not a guarantee that Kenya's export survival will improve since it has been established that trade relationships are short-lived, both in developed and developing countries. For this reason, we analyse the survival of exports from Kenya to African countries. Survival in the COMESA market is also of interest to this study. COMESA is a Free Trade Agreement (FTA) that was started in 2000 with a membership of twenty one countries. It is one of the main markets for Kenya and analysing its effect is important in informing trade policy since export expansion is a priority for the government of Kenya (ROK, 2017).

1.3 Objectives

The main objective of this study is to predict the perfomance of AfCFTA by assessing Kenya's current export survival. The specific objectives are:

1. To establish the survival of Kenya's exports to African countries that share an Economic Integration Agreement (EIA) with Kenya.
2. To establish the survival of Kenya's exports to COMESA market.

1.4 Organization of the Study

This paper is organized as follows. Section 2 reviews literature on export survival with a biase on the role of trade agreements on export survival. Section 3 describes the methodology in terms of data and empirical model. Section 4 presents descriptive statistics and empirical results while section 5 concludes the study.

2. Literature Review

2.1 Theoretical Literature review

Mainstream trade theories of Absolute advantage, Comparative advantage, and Heckscher-Ohlin, are primarily interested in illustrating why and how international trade occurs. As explained by Geda (2012), the Absolute advantage theory postulates that countries export commodities which they produce with less labour cost (possess Absolute Advantage) and import those whose labour cost is high (have Absolute Disadvantage). The Comparative advantage theory predicts that trade occurs between countries due to their respective opportunity costs (comparative production costs). The Heckscher-Ohlin theory claims that international trade between countries arises from the difference in their factor endowments. Nonetheless, these theories do not explain the survival and duration of trade.

Instead, theoretical frameworks such as the product cycle theory, Search and Matching theory and product switching theory form the basis of empirical debate on survival and duration of trade. Recently, Besedeš, Moreno-Cruz and Nitsch (2016) developed a model that links trade liberalization to export survival.

The product cycle theory by Vernon (1966) explains duration through the evolution of a product. Due to skilled labour and advanced technology, a product is initially produced by an advanced country. The country exports the product to a less developed country. However, with time, the product gains mass acceptance. As a result, the less developed country adopts the production technique which has cheap labour albeit less skilled. The less developed country acquires comparative advantage in producing and exporting the product because it has a lower cost of production. In contrast, the advanced country deserts the product or develops a better version of it. Whereas this process explains the death and resurgence of a product, it might not be instant. Therefore, this theory fails to explain short-term trade relations that often occur in real life (Hess et al., 2011; Besedeš et al., 2006b).

Export survival is also explained by the Search and Matching theory. Based on Rauch and Watson (2003), a trade relationship between a seller and a buyer undergoes different stages. The first stage entails searching and matching of buyers and sellers since they are located in different countries. Once a buyer has identified a seller, the seller starts exporting their product in small quantities. It is based on the reliability of the seller that the trade relationship will deepen or halt. A halt will mean that the trade relationship ceases and the buyer reverts to re-matching with another buyer. A trade relationship is deemed brief if the buyer and seller abandon the relationship soon (Besedeš, 2008). From this theory, the duration of a trade relationship is determined by the search cost, level of asymmetry in information and size of export volume at the start of a relationship.

The model by Bernard et al. (2010) on product switching links export survival to demand in foreign markets. Products that receive negative demand in the foreign market are switched. Those that receive positive demand continue to be traded. Therefore, deserting or adding a product is determined by characteristics of the firm, destination and product. Duration is accounted for by the possibility of introduction and product turn-over in a foreign market.

The model by Besedeš, Moreno-Cruz and Nitsch (2016) predicts that trade liberalization enhances export survival by reducing the per unit trade cost thereby raising entry rates. Before a seller establishes a reliable partner, they have to be productive. This level of productivity together with the per unit trade cost and set-up costs will determine their chances of entering a foreign market. The model predicts that trade liberalization reduces per unit trade cost and set-up costs. As a result, the number of trade relationships and their duration increases.

2.2 Empirical Literature review

Export survival is the amount of time (months or years) a firm's export of a product to a specific destination remains uninterrupted. This concept was first tested by Sabuhoro et al. (2006), and Besedeš and Prusa (2006a, 2006b) in the context of trade. Besedeš and Prusa (2006a) found that importers had a 67% chance of surviving beyond their first year of trading in the United States of America (US) while Sabuhoro et al. (2006) found that Canadian firms had a 42.2% chance of surving beyond the 12^{th} month. Most trade survival/duration studies that followed these pioneering works used macro data. These include Nitsch (2009) in Germany, Brenton et al. (2010) and Carrère and Strauss-Kahn (2017) in developing countries, Hess and Persson (2011; 2012) in European Union-15 and in the US, respectively, and Türkcan and Saygılı (2018) in Turkey. Lately, with the

availability of firm-level data, many trade survival studies are based on firms[1]. The findings of these studies affirm that exporters have a short life span in foreign markets.

A number of macroeconomic and firm-specific factors have been identified as determinants of export survival by past studies. However, the role of trade agreements, which is of interest in this study, is less studied especially in Kenya where we are only aware of three studies on exports survival (Kinuthia, 2014; Chacha and Edwards, 2017, and Majune et al., 2020). Kinuthia (2014) used bilateral data between Kenya and 221 partners for a period ranging from 1995 to 2010. By applying the Cox proportional hazard model, he found that EAC and COMESA did not significantly improve export survival of products from Kenya. Chacha and Edwards (2017) arrive at the same conclusion using firm-level Customs transaction data, between 2004 and 2013. They analysed Cox proportional hazard model and a logit model.

Majune et al. (2020) is the latest study to explain export duration in Kenya. The study estimated a discrete-time random effects logit regression model on data ranging from 1995 to 2016. The study found that COMESA and the African Growth and Opportunities Act (AGOA) significantly raised export survival in Kenya. EAC on the other hand reduced it. Whereas these Kenya-specific studies are insightful, it is important to establish how duration of trading under an agreement affects export survival. This was not done in these studies.

Duration of trading under an agreement has a "timing" effect which is either positive or negative. It is negative when firms that start trading after an agreement has been formed are small and less productive. Hence, they are likely to exit when faced by a negative shock on demand in the foreign market or their own productivity. It is positive when the newcomers are highly productive meaning that they are likely to trade for the foreseeable future. The overall effect depends on the dominant outcome among these two opposing effects (Besedeš et al., 2016; Oanh and Linh, 2019)

The prevailing message from most studies covering other regions is that the effect of EIAs on trade survival is heterogenous. Besedeš and Blyde (2010) started this line of thought by establishing the drivers of export survival in Latin America using the Cox model. They showed that countries which shared an FTA had a higher rate of export survival than those without. Evidence from Africa shows that intra-Africa trade cooperation enhances export survival (Kamuganga, 2012). However, the effect is more on deeper EIAs such as Customs Unions (CUs), Common Markets (CMs) and

[1] For instance; Békés et al. (2012) in Hungary, Lejour (2015) in Netherlands, Cui et al. (2018), Zhu et al. (2019) in China, and Kostevc et al. (2020) in Slovenia.

and Monetary Unions (MU) than shallow ones like Preferential Trade Agreements (PTAs). Trading under the North American Free Trade Agreement (NAFTA) increased survival in Canada and the US while the effect was negative in Mexico (Besedeš, 2013). The author used two variables, NAFTA members and NAFTA in effect, to assess this effect. NAFTA in effect which represents the period of existence of NAFTA in a country reduced survival in all countries though insignificant in Canada.

Besedeš et al. (2016) in a comprehensive study derived the theoretical model linking export survival to liberalization and analysed the effect of EIAs in terms of their existence and trade relationships that start after an EIA has been implemented. By estimating a discrete-time random effects probit regression model, the authors conclude that EIAs increased export survival but the effect was positive for trade relationships that started before an EIA was formed. Trade relationships that started after implimentation of EIA were likely to die faster besides suffering a decline in their volumes of trade.

Degiovanni et al. (2017) advanced the study by Besedeš et al. (2016) by focusing on Latin America. The latter study was based on 180 countries in the world. Degiovanni et al. (2017) established that deeper EIAs increased export survival than shallow ones. Trade relationships that existed after a trade agreement was signed had a lower chance of ceasing although it depended on the depth of an agreement. The effect of spells that existed prior to an agreement also differed by the depth of agreement. Using the methodology by Kohl et al. (2016), the authors constructed an index of quality of trade agreement and established that high quality agreements enhanced survival more than low quality ones.

Oanh and Linh (2019) introduced diversion effects of EIAs to this line of research. The authors used SITC 4-digit level data for 149 countries between 1962 and 2000. The probit model applied for analysis. Two variables, exporter and importer outsider, were used to describe the diversion effect. Accordingly, both importers and exporters had the possibility of operating in various markets if they traded under several EIAs. This meant that some EIAs were more beneficial. Probit results revealed that both variables reduced export survival. Hence, a new EIA increased the failure rate of products exported/imported under an existing EIA. The effect was higher in manufactured than agricultural products.

At country level, Türkcan and Saygılı (2018) explored how EIAs affected Turkey's export survival. The authors used four EIAs: Non-Reciprocal PTAs, PTAs, FTAs, and CUs. Furthermore,

they assessed the effect of each EIA by its existence, whether it was in effect between an importer and Turkey in a specific year, whether a trade relationship started after implementation of an EIA, and duration of an EIA was active. Similar to previous studies, it was found that EIAs increased the chance of a trade relationship surviving, particularly FTAs and PTAs. However, trade relationships that started after an agreement had been established were likely to die. The authors applied a discrete-time probit model with random effects in their analysis.

2.3 Overview of literature

The model by Besedeš, Moreno-Cruz and Nitsch (2016) is best suited for our study since it links trade liberalization to export survival. The model predicts that trade liberalization reduces per unit trade cost and set-up costs. Therefore, the number of trade relationships and their duration increases. This hypothesis is indefinite among empirical studies as trade agreements either increase or decrease export survival. Trade agreements are used as a proxy for trade liberalization. Studies on Kenya find that COMESA improves export survival. However, none of these studies have assessed export survival under Economic Integration Agreements (EIAs) in Africa or the how duration of trading under an agreement affects export survival.

3. Methodology

3.1 Data

This study uses monthly firm-product-destination export data from the updated Exporter Dynamics Database by the World Bank (Fernandes et al., 2016)[2]. This data contains actual customs transactions records from the Customs Services Department of the Kenya Revenue Authority (KRA). The data ranges from January 2006 to December 2017. Transactions are recorded for each exporter by product (at 8-digit HS level), destination, date of export and value of export. Exporters are identified by their tax ID. As a first step, trade flows are aggregated to establish the monthly value a product is exported by a firm since the data is recorded at the transaction level. Next, trade flows are aggregated at the 6-digit level to form a list of HS 6-digit categories that are comparable internationally. This is important since HS classification has undergone several major revisions over time (Cebeci et al., 2012; Bellert and Fauceglia, 2019). Thus, we applied the product concordance prepared by Cebeci (2012) to form a consistent HS 6-digit classification. This process

[2] We thank Ana Fernandes who oversees the EDD database at the World Bank for granting us access to this updated database which is yet to appear online.

reduced the number of HS 6-digit codes from 5,138 to 4,067. At last, the value of these products was converted from Kenya shillings to US dollars using exchange rate values from the International Monetary Fund (IMF).

Following the approach by Besedes et al. (2016), Türkcan et al (2018) and Oanh and Linh (2019), we create three variables to fully establish the effects of EIAs on export duration. The first variable is labelled *EIA exists*, which is a dummy that indicates whether Kenya has a trade agreement with a partner or not. The second variable is labeled *Duration of EIA* to capture the length of a trade agreement (in months). The third variable is *Spell starts after EIA*, which is a dummy that represents trade relationships that start after an agreement has been made. Besedeš et al. (2016), Türkcan et al. (2018) and Oanh and Linh (2019) use all the three variables[3]. However, only Türkcan et al. (2018) analysed EIAs at pooled and dis-aggregated levels (NR-PTA, PTA, FTA and CU). We adopt this approach by considering both the pooled EIA as well as COMESA. This enables us to investigate heterogenous effects of various trade agreements and to assess the potential gains from the AfCFTA, which came into force in May 2019 (Abrego et al., 2020).

Apart from the above-mentioned explanatory variables, several country-specific and firm-specific variables are used. This is informed by related studies (Hess and Persson, 2011; Cadot et al., 2013; Stirbat et al., 2015; Besedes et al., 2016; Majune et al., 2020). First, country-specific variables are included to show how a firm's export survival rates is affected by characteristics of the destination country. Country-specific variables consist of distance, common border, real exchange rate and importer's gross domestic product (GDP). Gravity literature posits that countries which share a border or are geographically close have low trade costs. Hence, the survival rate of firms is expected to be high. GDP of the importer proxies market thickness (Brenton et al., 2010) and it is expected to increase the survival of exports. Furthermore, the change in the relative real exchange rate is included to assess the effects of the changes in exchange rates on the survival rate. We assume that an appreciation of the importer's currency reduces chances of exports failing (Hess and Persson, 2011). Finally, the analysis also includes cost-to-import of the partner variable to determine the extent to which trade cost affects export survival. We envisage that variable cost-to import will increase the export hazard rate.

[3] Nonetheless, these studies also use a variable called *EIA in effect*. We do not do so in our study because this variable is highly correlated with *EIA exists.* Moreso, our starting period for our database is more recent as compared to Besedeš et al. (2016), Türkcan et al (2018) and Oanh and Linh (2019) whose data sets range drom 1962 and 1998 respectively. This means that most trade agreements were already in existence in our database.

Firm-specific variables are used to explore how past experience in a particular foreign market and diversification (in terms products and markets) affect the duration of exports. The first firm-specific variable, initial export value, is included to evaluate the existence of ex-ante trust between trading partners, which is expected to reduce export hazard (Rauch and Watson, 2003). The lagged duration, which is the number of months that a previous export spell lasted, is included to assess the impact of firm's previous experience on the hazard rate. Moreover, the total value of the exports of a firm is also added to the analysis to account the effects of exporter's experience on duration. Both variables are expected to have a negative effect on the hazard rate (Hess and Persson, 2011; Stirbat et al., 2015).

The effects of diversification on firm export survival are captured by three variables, namely the total number of firms selling the same product in the same destination (network effects), the number of export markets to which a given product is exported by the same firm (geographical diversification) and the number of export products that a given firm exports to the same destination (product scope). Following Cadot et al. (2013), we expect a negative relationship between these variables and hazard rates. In addition to these explanatory variables, we added duration, spell and month dummies, as proposed by Hess and Persson (2011). The definitions and data sources of all variables are provided in Table A.1 in the appendix.

3.2 Empirical Model

We employ a probit model to address our objective. A probit model falls within the class of discrete-time duration models. These models have three advantages over continuous-time models such as Cox (1972). Firstly, they deal with frailty (unobserved heterogeneity). Secondly, they account for tied durations when trade relationships end at the same time, and lastly, they disregard proportional hazards assumption which assumes that covariates have a similar impact on the hazard rate over time (Hess and Persson, 2011; 2012). Therefore, we specify the probit model as follows:

$$h(x_{im}) = Pr(T_i < t_{m+1} | T_i > t_m) = \Phi(x'_{im}\beta + \gamma m + v_i) \quad (1)$$

$h(x_{im})$ is the hazard rate. It occurs after period T_i where a trade relationship is active. The trade relationship exists over a time interval, (t_m, t_{m+1}), for m=1,…, J. t_m is the start and t_{m+1} is the end. x_{im} is a vector of independent variables while β is their respective coefficients.

A positive sign on the coefficient indicates a rise in the hazard rate but a negative sign one means a fall in the hazard rate. γm represents the baseline hazard rate. It shows the variation of the hazard

rate across periods. Since its function is unknown, we present it as a dummy variable identifying the duration intervals of each spell. v_i is a Gaussian distribution random effects indicator that deals with the problem of unobserved heterogeneity (frailty). Overlooking this problem may introduce a severe bias into the nature of the duration dependence and estimates of the covariate effects (Hess and Persson, 2012). It is solved by including random effects in the hazard function. Consequently, our discrete-time probit model accounts for frailty (firm-specific variations) by using random effects at the firm-partner-product level as seen in equation 1. Empirically, monthly fixed effects are also included to control for endogeneity problem. $\Phi(.)$ is probit distribution function that ensures our hazard rate falls within the range of zero (0) and negative one (-1).

The log-likelihood function is given by:

$$logL = \sum_{i=1}^{n} \sum_{m=1}^{j} [y_{im}\, log(h_{im}) + (1 - y_{im}) log\,(1 - h_{im})] \quad (2)$$

L is an expression of likelihood for the whole sample, in our case importing countries from i=1,…, n. Small m is time interval in terms of spell from m=1,…, j. y_{im} is a binary dependent variable, which takes the value 1 if spell *i* is observed to cease during the *mth* time interval, and zero otherwise. h_{im} is the hazard rate whose functional form has been specified in equation 2. Results are interpreted as follows. A specific variable decreases survival if the sign of its coefficient is positive and vice versa.

We accommodate left-censoring bias of spells by excluding all active trade relationships in the first month (January 2006). This is because we do not know whether the firm started exporting a particular product in that month or earlier. Annual studies often exclude the first year of trading (Békés and Muraközy, 2012; Anwar et al., 2019)[4]. However, the last month of trading is recorded (right-censoring problem). This is because the survival model automatically solves this problem (Anwar et al., 2019). Completed spells are recorded as they are while multiple spells are treated as dummy variables (Besedeš et al., 2006a; Fu et al., 2014)[5].

[4] This is another advantage of using monthly data since data that is lost is only for one month other than one year as is the practice in annual studies.

[5] Multiple spells occur when a trade relationship recurs after collapsing. This can happen more than once.

4. Study Findings

4.1 Descriptive Statistics

Figure 2 shows the total and average value of exports from Kenya to Africa per month (2006-2017). The left-hand side graph of Figure 2 indicates that total exports of merchandise to Africa have fluctuated over time. The least value of exports per month is USD$ 57 million while the highest is USD$ 206 million. The trend consistently increased within the first one hundred months but declined thereafter. The right-hand side graph of Figure 2 indicates the average value of exports per month has fluctuated but increased over time. The value was seldom above the mean in the first seventy-eight months but it has improved with time. Nonetheless, fluctuations in both graphs indicate firms have dropped and re-emerged throughout the period of study.

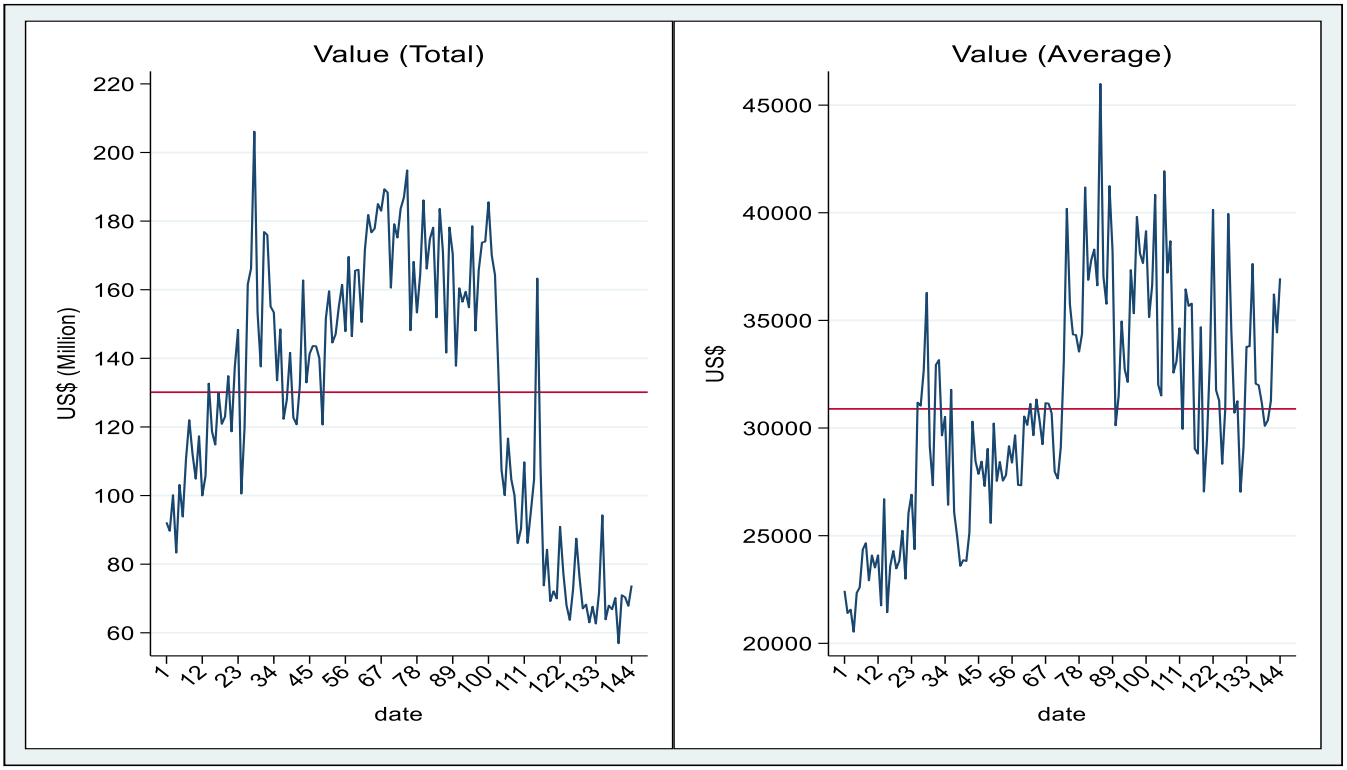

Figure 2: Export value in months (January 2006 - December 2017)

Table 1 indicates that most exports from Kenya are imported by countries in the Eastern Africa region followed by those in the middle of Africa, Northern Africa, Western Africa and Southern Africa respectively. The highest export is to the Northern Africa market. Equally, about US$ 0.03 million exports are traded with countries that have an agreement with Kenya. However, average

exports to the COMESA region are slightly higher than those exported to all EIAs. The maximum value of exports was US$ 21.29 million.

Table 1: Exports by region and trade agreements (US$ million)

Region	N	Mean	Std. Dev	Min	Max
Eastern Africa	408,354	0.03159	0.1665	7.69e-09	19.71
Middle Africa	60,042	0.02969	0.09629	2.14e-07	2.487
Northern Africa	113,130	0.02821	0.2683	1.37e-08	21.29
Southern Africa	19,906	0.02265	0.1509	1.24e-07	7.222
Western Africa	15,144	0.02745	0.1293	8.69e-08	3.18
Agreements					
EIA	573,621	0.03077	0.1865	7.69e-09	21.29
COMESA	459,592	0.03239	0.1991	7.69e-09	21.29

Kaplan-Meier survival functions are also used to describe survival of exports from Kenya. This is a non-parametric survival function whose results are shown in Figure 3. It can be seen from the left-hand side graph of Figure 3 that operating under an EIA increases export survival to African countries than operating without an agreement (left-hand side graph of Figure 3). Data on EIAs is obtained from Baier and Bergstrand's website[6] and WTO's Regional Trade Agreements Information System (RTA-IS)[7] database. These data sets record six levels of economic integration at bilateral level for 195 countries. That is NR-PTA, PTAs, FTAs, CUS, CMs, and EUs. We only consider four types of EIAs since CUs and EUs are not present throughout this period. The graph on the right-hand side indicates that about 70% of exports survive beyond the first year exporting to COMESA markets and about 50% live to the 12th month. Less than 10% of exports to the COMESA market survive beyond 108th month.

[6] See www.nd.edu/jbergstr.
[7] See http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx.

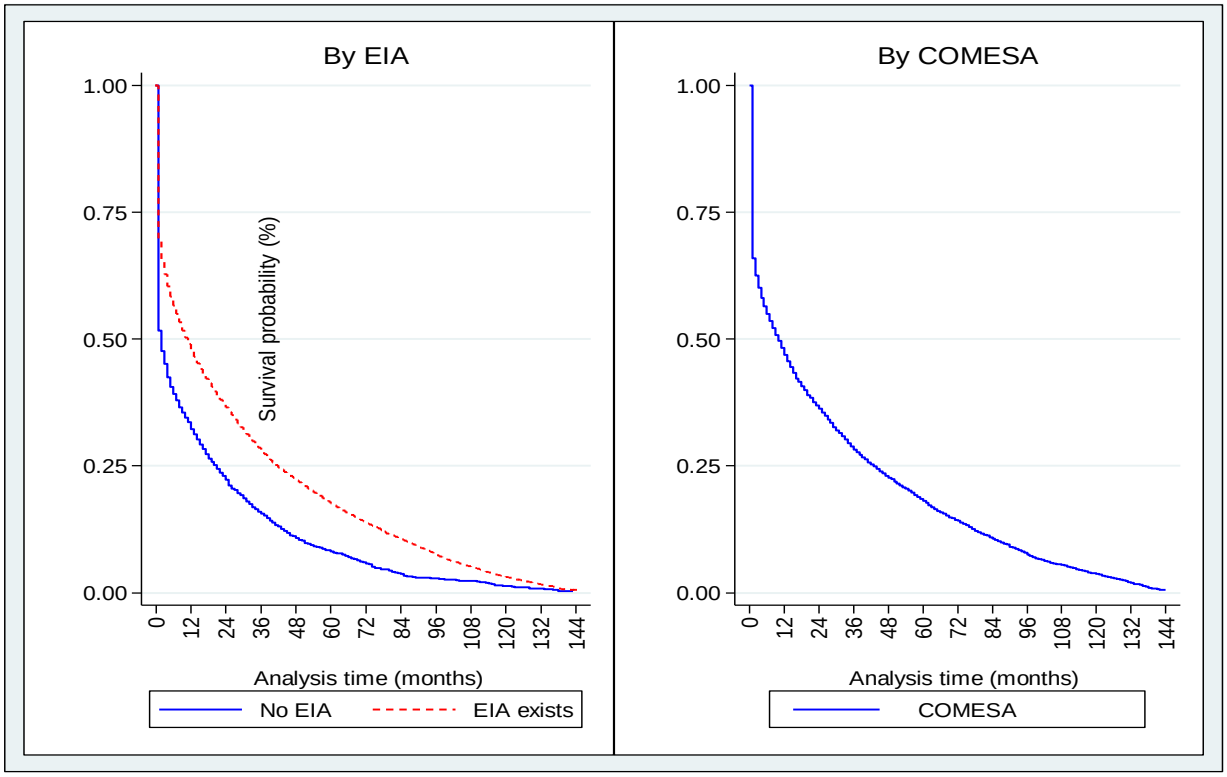

Figure 3: Kaplan-Meier survival function for total exports by presence of EIA and COMESA

4.2 Regression Results

Probit regression results are presented in Table 2. The dependent variable, likelihood of a trade relationship ending, was regressed on a set of country-specific and firm-specific variables along with other control variables. A positive sign on a coefficient indicates failure of an export relationship (increase in the hazard rate) while a negative coefficient signifies an increase in survival of an export relationship.

The first three columns of our probit regressions results consider the pooled EIA. In the first specification, our results show that having an EIA significantly increases export survival in Kenya. This affirms earlier results in Figure 3 that having an agreement improves survival chances of exporters from Kenya. This also means that existence of a trade agreement reduces market entry costs besides reducing trade costs of existing trade agreements. Similar results were reported by Besedeš et al. (2016), Degiovanni et al. (2017) and Türkcan et al (2018).

The second specification includes the duration of an EIA. Similar to Besedeš et al. (2016), Türkcan et al. (2018) and Oanh and Linh (2019), we find that the longer an agreement exists, the higher the

chances of a trade relationship ceasing. This implies that whereas formation of EIAs facilitates entry of firms that would otherwise not have traded, these firms are likely to exit if they are small and less productive. This is because these firms are susceptible to negative shocks on their productivity or demand in the foreign market (Besedeš et al., 2016; Türkcan et al., 2018; Oanh and Linh, 2019). The third specification includes trade relationships that start after an agreement has been established. Our results suggest that these relationships are likely to cease although the effect is insignificant. Similar results have been found by Türkcan et al. (2018) in Turkey.

Given that AfCFTA pools several trade agreements, we separately review the effect of COMESA on export duration. In our results, we only consider whether an importer is a member of COMESA, and the duration they have been in this agreement. The variable, *Spell starts after EIA*, is dropped since most countries were members of the agreement by the start of our data in January 2006.

The first column under COMESA considers the impact of trading with COMESA members on survival of export from Kenya (see Table 2). The coefficient is positive and significant meaning that the agreement contributes to an exit of Kenyan exporters from the COMESA market. These results differ with the those of Kinuthia (2014) and Majune et al. (2020) who establish a positive effect of COMESA on survival of exports from Kenya. Chacha and Edwards (2017) find similar results to ours, albeit subject to the model specification. Their results from logit regression models with random effects have the expected sign of COMESA reducing export failure but their logit with fixed effects shows that COMESA increases export failure. Some results by Türkcan et al. (2018) indicate that FTAs reduced export survival.

We explain these shocking results in twofold. First, it could be due to the depth of COMESA as an agreement. Economic Integration Agreements (EIAs) classifies agreements into five categories. They range from the least deep to the deepest as follows: preferential trade agreements (PTAs), free trade agreements (FTA), Customs Union (CU), Common Market (CM) and economic unions (EU) (Baier et al., 2014). Going by the Kamuganga (2012), and Türkcan and Saygılı (2018), deeper trade agreements improve export survival more than shallow ones. COMESA is an FTA and is not very deep. Another reason for this unexpected result could be due operational challenges that affect COMESA, just like many agreements in africa. Examples include lack of political commitment, overlapping membership, weak private sector participation and infrastructure, and lack of product diversification (Geda and Kebret, 2008; Chacha, 2014; Geda and Seid, 2015).

Table 2: Probit regression results for export survival in Kenya

	EIA			COMESA	
	(1)	(2)	(3)	(1)	(2)
Distance	0.097***	0.101***	0.097***	0.179***	0.200***
	(8.22)	(8.58)	(8.23)	(12.88)	(14.31)
Common border	-0.006	0.001	-0.006	0.012	0.0396**
	(-0.30)	(0.05)	(-0.30)	(0.67)	(2.18)
Cost to import	0.001***	0.001***	0.001***	0.001***	0.001***
	(4.39)	(3.88)	(4.39)	(5.18)	(4.49)
Partner's GDP	-0.046***	-0.047***	-0.046***	-0.053***	-0.060***
	(-12.09)	(-12.38)	(-12.09)	(-14.81)	(-16.69)
Real exchange rate	0.001	0.001	0.001	0.001	0.001
	(0.69)	(0.64)	(0.69)	(0.67)	(0.78)
Initial export value	-0.070***	-0.070***	-0.070***	-0.070***	-0.071***
	(-62.79)	(-62.98)	(-62.79)	(-62.90)	(-63.52)
Lag duration	-0.020***	-0.020***	-0.020***	-0.020***	-0.020***
	(-39.73)	(-39.83)	(-39.73)	(-39.76)	(-39.82)
Number of firms	-0.001*	-0.001*	-0.001*	-0.001	-0.000
	(-1.84)	(-1.83)	(-1.84)	(-1.82)	(-1.09)
Number of export products	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	(-36.04)	(-35.98)	(-36.04)	(-35.65)	(-35.37)
Number of export markets	-0.030***	-0.030***	-0.030***	-0.030***	-0.030***
	(-43.73)	(-43.66)	(-43.73)	(-43.75)	(-43.23)
Total exports	-0.040***	-0.040***	-0.039***	-0.040***	-0.040***
	(-27.17)	(-27.45)	(-27.17)	(-27.55)	(-27.90)
EIA exists	-0.050***	-0.238**	-0.071	0.141***	0.003
	(-3.63)	(-2.19)	(-0.67)	(6.90)	(0.11)
Duration of EIA		0.023***			0.024***
		(8.62)			(13.83)
Spell starts after EIA		0.029	0.021		
		(0.27)	(0.20)		
Constant	2.918***	2.875***	2.918***	2.352***	2.359***
	(42.33)	(41.65)	(42.32)	(24.14)	(24.24)
Duration dummy	Yes	Yes	Yes	Yes	Yes
Spell dummy	Yes	Yes	Yes	Yes	Yes
Monthly dummy	Yes	Yes	Yes	Yes	Yes
Observations	568,656	568,656	568,656	568,656	568,656
Log-likelihood	-290127.9	-290090.6	-290127.9	-290110.8	-290015.0
Rho	0.160	0.159	0.160	0.159	0.158
	(51.05)	(50.95)	(51.05)	(50.91)	(50.75)

Note: Z statistics in parenthesis. Asterisk indicates the level of significanc p<0.10, ** p<0.05, *** p<0.01.*

The duration of COMESA is included in the second column of COMESA results. Both coefficients of COMESA and duration of COMESA are positive. This means that exports are more likely to fail when they are exported to COMESA markets for long. It also implies that, most new firms that eport to COMESA are less productive and small. Thus raising their chances of exiting in the face of a negative shock. Since COMESA is an FTA, our results are akin to those of Türkcan et al. (2018) who found that the duration of FTAs reduces export survival.

In line with the literature, most of the country-specific variables had the predicted influence on export hazard rates except for the effect of common border (under COMESA). In addition, results are relatively similar across EIA and COMESA. Hence, survival rates rise with an increase in the importer's GDP, but decline with an increase in cost to import. The estimated coeffients for the firm-specific variables were also mostly significant with the predicted signs. The initial export value, lagged duration, total export value were associated with a lower probabilty of export failure, suggesting that trust, knowledge, and firms' export experience could be key factors in achieving higher export survival rates for firms. Similar results have been reported by Hess and Persson (2011), Cadot et al. (2013) and Stirbat et al. (2015). In all regressions, product and market diversifications were both statistically significant with negative effects on the export hazard rate. These results are consistent with those of Cadot et al. (2013). The network effects, proxied by the number of firms, have also predicted effects on the odds of export failure in the case of EIAs, similar to findings of Cadot et al. (2013). Accordingly, the results suggest that prior experience, product and market diversification and strong networks of firms increases the duration of firm exports.

5. Conclusion and Policy Implications

This study sought to inform ongoing discussions on AfCFTA by establishing the survival of exports from Kenya together with identifying the factors that explain it. The main policy variables were overall EIAs and COMESA trade agreement. Unlike most studies which use annual data, this study used monthly level customs transactions data. This to our knowledge has only been done by Sabuhoro, Larue and Gervais (2006), Tovar and Martinez (2011) and Stirbat, Record and Nghardsaysone (2015) in studying export survival. Our data is at HS-6 digit product export data from Kenya to 52 African partners and 20 COMESA countries between January 2006 and December 2017.

Similar to previous studies, we found that exporting under an agreement enhances survival as opposed to trading with a country that Kenya had no trade agreement. About 70% of exports from Kenya survive beyond the first month of trading in COMESA. Half of them survive to the 12^{th} month and less than 10% of them survive beyond the 108^{th} month.

Regression results from the probit model with random effects revealed that trade agreements enhanced survival of export from Kenya. However, trading under COMESA reduced survival of exports from Kenya. This result is insightful in the following ways: First, being an FTA, COMESA is considered shalow in the hierarchy of Economic Integration Agreements (EIAs) (Baier et al., 2014). Hence exporters from Kenya might survive more in deeper agreements due to their policy conditions. Second, trading under the AfCFTA is likely to improve export survival.

Based on these findings, we recommend that further analysis should explore why COMESA adversely affects Kenya's export survival. A starting point for policy makers at COMESA is to increase the incentives of trading goods under COMESA, thereby making it a deep EIA (Baier et al., 2014). Other interventions include improving transport and logistics infrastructure, facilitating trade *inter alia*. These are essential for Kenyan firms to integrate into global production chains. They also help firms to improve their productivity levels which diversifies their export portfolios. These policies in turn will help Kenya to achieve sustainable long-run economic growth.

References

Abrego, L., Amado, M. A., Gursoy, T., Nicholls, G. P., & Perez-Saiz, H. (2019). *The African Continental Free Trade Agreement: Welfare Gains Estimates from a General Equilibrium Model (WP/19/124).* Washington, D.C: International Monetary Fund.

Abrego, L., de Zamaróczy, M., Gursoy, T., Issoufou, S., Nicholls, G. P., Perez-Saiz, H., & Rosas, J.-N. (2020). *The African Continental Free Trade Area: Potential Economic Impact and Challenges.* Washington, D.C: International Monetary Fund.

Anwar, S., Hu, B., Jin, Y., & Wang, K. (2019). China's export tax rebate and the duration of firm export spells. *Review of Development Economics*, 23(1), 376-394.

Baier, S., Bergstrand, J., & Feng, M. (2014). Economic integration agreements and the margins of international trade. *Journal of International Economics*, 93(2), 339-350.

Békés, G., & Muraközy, B. (2012). Temporary trade and heterogeneous firms. *Journal of International Economics*, 87(2), 232-246.

Bellert, N., & Fauceglia, D. (2019). A practical routine to harmonize product classifications over time. *International Economics*, 160,84-89.

Bernard, A. B., Bøler, E. A., Massari, R., Reyes, J.-D., & Taglioni, D. (2017). Exporter Dynamics and Partial-Year Effects. *American Economic Review* , 107(10), 3211-3228.

Bernard, A. B., Redding, S. J., & Schott, P. K. (2010). Multiple-Product Firms and Product Switching. *American Economic Review*, 100(1), 70-97.

Besedeš, T. (2008). A Search Cost Perspective on Formation and Duration of Trade. *Review of International Economics*, 16(5), 835-849.

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

Besedeš, T., & Blyde, J. (2010). *What Drives Export Survival? An Analysis of Export Duration in Latin America.* Inter-American Development Bank, mimeo.

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

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

Besedeš, T., Moreno-Cruz, J., & Nitsch, V. (2016). *Trade Integration and the Fragility of Trade Relationships: Theory and Empirics (Georgia Tech Working Paper).* Retrieved from https://business.und.edu/undergraduate/economics-and-finance/_files/docs/_spring_2017_papers/besedes-eia.pdf

Blyde, J., Graziano, A., & Volpe, M. C. (2015). Economic integration agreements and production fragmentation: evidence on the extensive margin. *Applied Economics Letters*, 22(10), 835-842.

Brenton, P., Saborowski, C., & Uexkull, v. 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., & Rauch, F. (2013). Success and failure of African exporters. *Journal of Development Economics*, 101, 284-296.

Carrère, C., & Strauss-Kahn, V. (2017). Export survival and the dynamics of experience. *Review of World Economics*, 153(2), 271-300.

Cebeci, T. (2012). *A"Concordance among"Harmonized"System"1996,"2002"and"2007" Classifications (World Bank mimeo).* Retrieved from http://econ.worldbank.org/exporter-dynamics-database.

Chacha, M. (2014). Regional integration and the challenge of overlapping memberships on trade. *Journal of International Relations and Development*, 17(4), 522-544.

Chacha, P. W., & Edwards, L. (2017). *The Growth Dynamics of New Export Entrants in Kenya:A Survival Analysis (Working Paper 712).* Economic Research Southern Africa.

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

Cui, Y., & Liu, B. (2018). Manufacturing servitisation and duration of exports in China. *The World Economy*, 41(6), 1695-1721.

Degiovanni, P., Florensa, L., & Recalde, M. (2017). Latin American Integration Effects on Trade Relationships: Survival, Growth and Initial Volume. *Journal of Applied Economic Sciences*, 7(53), 2129-2142.

Fernandes, A. M., Freund, C., & Pierola, M. D. (2016). Exporter behavior, country size and stage of development: Evidence from the exporter dynamics database. *Journal of Development Economics*, 119, 121-137.

Fernandes, A. M., Maemir, H., Mattoo, A., & Forero, A. (2019). *Are Trade Preferences a Panacea? The African Growth and Opportunity Act and African Export (Policy Research Working Paper 8753).* World Bank Group.

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

Geda, A. (2012). *Fundamentals of International Economics for Developing Countries: A Focus on Africa.* Nairobi, Kenya: African Economic Research Consortium.

Geda, A., & Kebret, H. (2008). Regional Economic Integration in Africa: A Review of Problems and Prospects with a Case Study of COMESA. *Journal of African Economies*, 17(3), 357-394.

Geda, A., & Seid, E. H. (2015). The potential for internal trade and regional integration in Africa. *Journal of African Trade*, 2(1-2),19-50.

Geda, A., & Yimer, A. (2019, December 11). *The Trade Effects of the African Continental Free Trade Area (AfCFTA): An Empirical Analysis.* Retrieved from https://www.researchgate.net/publication/337733333_The_Trade_Effects_of_the_African_Continental_Free_Trade_Area_AfCFTA_An_Empirical_Analysis

Geishecker, I., Schröder, P. J., & Sørensen, A. (2019). One-off export events. *Canadian Journal of Economics*, 52(1), 93-131.

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

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

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

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

Kohl, T., Brakman, S., & Garretsen, H. (2016). Do Trade Agreements Stimulate International Trade Differently? Evidence from 296 Trade Agreements. *The World Economy*, 39(1), 97-131.

Kostevc, Č., & Zajc Kejžar, K. (2020). Firm-level export duration: The importance of market-specific ownership linkages. *The World Economy*, 43(5), 1277-1308.

Majune, S. K., Moyi, E., & Kamau, G. J. (2020). Explaining Export Duration in Kenya. *South African Journal of Economics*, 88(2), 204-224.

Mukwaya, R. (2019). The Impact of Regional Integration on Africa's Manufacturing Exports. *Journal of African Trade*, 6(1-2), 81-87.

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

Nyaga, N. G. (2015). The Evolution of Kenya's Trade Policy. *Indian Journal of Economics and Development*, 3(1), 120-126.

Oanh, N. T., & Linh, D. T. (2019). Diversion Effect of Economic Integration Agreements . *VNU Journal of Science: Economics and Business*, 35(5E), 28-41.

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

ROK. (2017). *National Trade Policy: Transforming Kenya into a Competitive Export-Led and Efficient Domestic Economy.* Nairobi, Kenya: Government Printers.

Sabuhoro, J. B., Larue, B., & Gervais, Y. (2006). Factors Determining the Success or Failure of Canadian Establishments on Foreign Markets: A Survival Analysis Approach. *The International Trade Journal*, 20(1), 33-73 .

Stirbat, L., Record, R., & Nghardsaysone, K. (2015). The Experience of Survival: Determinants of Export Survival in Lao PDR. *World Development*, 76, 82-94.

Tovar, J., & Martinez, L. (2011). *Diversification, networks and the survival of exporting (Serie Documentos Cede, 2011-08).* Bogotá, Colombia: Universidad de Los Andes.

TRALAC. (2020a, September 15). *African Continental Free Trade Area (AfCFTA) Legal Texts and Policy Documents*. Retrieved from Trade Law Centre: https://www.tralac.org/resources/our-resources/6730-continental-free-trade-area-cfta.html

TRALAC. (2020b). *The African Continental Free Trade Area: A tralac guide.* Stellenbosch: Trade Law Centre.

Türkcan, K., & Saygılı, H. (2018). Economic Integration Agreements and the Survival of Exports. *Journal of Economic Integration*, 33(1),1046-1095.

Valensisi, G., Lisinge, R., & Karingi, S. (2016). The trade facilitation agreement and Africa's regional integration. *Canadian Journal of Development Studies*, 37(2), 239-259.

Vernon, R. (1966). International Investment and International Trade in the Product Cycle. *The Quarterly Journal of Economics*, 80(2), 190-207.

Wacziarg, R., & Welch, K. H. (2008). Trade Liberalization and Growth: New Evidence. *The World Bank Economic Review*, 22(2), 187-231.

World Bank. (2020). *The African Continental Free Trade Area: Economic and Distributional Effects.* Washington, DC: World Bank.

Zhu, X., Liu, B., & Wei, Q. (2019). Does participation in global value chains extend export duration? *Review of Development Economics*, 23(3), 1282-1308.

Appendix

Table A.1: Detailed description of variables

Variable	Description	Source
Number of firms	Number of firms selling the same product in the same destination. This measures the network effects	Customs Transaction Data
Number of export markets	Number of destinations to which a given product is exported by the same firm. This measures geographical diversification	Customs Transaction Data
Number of export products	Number of products that a given firm exports to the same destination. This measures the product scope	Customs Transaction Data
Initial export value	Value of export at product level measured in USD for the previous month	Customs Transaction Data
Total exports	Total value of exports per firm measured in Kenya shillings	Customs Transaction Data
Lag duration	Length of the previous spell for repeated spells	Customs Transaction Data
EIA exists	Dummy, 1 if Kenya and its partner have an agreement at some point, and 0 otherwise	Baier and Bergstrand's website: www.nd.edu/jbergstr and WTO's RTA-IS database.
Duration of EIA	Measures the length of an agreement (in months)	Baier and Bergstrand's website: www.nd.edu/jbergstr and WTO's RTA-IS database.
Spell starts after EIA	Dummy, 1 if a trade relationship starts after an agreement has been made, and 0 otherwise	Baier and Bergstrand's website: www.nd.edu/jbergstr and WTO's RTA-IS database.
Partner's GDP	Log of GDP (current 2010 US$) of partner	World Development Indicators (WDI)
Real exchange rate	Percentage change in log relative RER: Yearly percent change in the log of the relative real exchange rate between Kenya and its trading partner	WDI
Distance	Log of geographical distance in Kms between the capital city of Kenya (Nairobi) and those of parners	CEPII's GeoDist database: http://www.cepii.fr
Cost to import	Cost to import (US$ per container) for partner	WDI
Common border	Dummy, 1 if a country shares a boder with Kenya, and 0 otherwise	CEPII's GeoDist database: http://www.cepii.fr