Export Duration in West Africa, an Analysis of Economic Integration Agreements' Effects

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Abstract

The main objective of economic trade agreements is to reduce trade costs and stimulate economic growth through trade. Using data over the period 1962 to 2019, this paper examines the contribution of economic integration agreements on exports duration in West Africa. The results show that economic integration agreements influence positively trade survival in West Africa. Nevertheless, the average time of trade survival is short, which is compatible with results found in the literature. Results in this study show that when partner countries are part of a regional economic communities, their trade relationship survives longer than other countries outside the community. Data at a more disaggregated level also confirmed that trade duration is short-lived. The findings provide insights to policy makers at the era of the implementation of the African Continental Free Trade Area agreement as well as at the renewal of the AGOA agreements. More importantly, when negotiating agreements, the region can show more collaboration and level ground for more investments in sectors where these countries have comparative advantages.

JEL Codes: F13, C41, O24

Keywords: Export Durations, Economic Integration, West Africa

1.0 Introduction

Regional trade agreements appear as tools for fostering trade, economic growth as well as integration. They appeal to reduce trade costs and to engage trade partners in consolidate trade relationships. The duration of these trade relationships has shaped the trade research frontiers. Major contributions to this strand of trade literature come from Besedeš et al. (2006), Brenton and al. (2010), Hess & Persson (2012) and others. In the African context Chacha & Edwards (2017) and Socrates (2016) among others, examine trade duration and covariates that influence it. Among other factors, economic integration agreements appear to be one of the key factors in trade duration. For instance, Martuscelli & Varela (2018) mention that the probability to continue exporting in a given market improves when the two partners are engaged in a trade agreement, for it is used as an important trading cost reduction. Particularly, Kamuganga (2012) examines the effect of economic integration agreement on exports' survival in African countries. In a comprehensive analysis, he demonstrates how all forms of economic integration agreement (henceforth EIA) reduce the trading costs of countries involved and then reduce the death rate of export relationships.

The aim here is to provide a detailed analysis of the export duration of the ECOWAS[1] countries members regarding different trade agreements they are engaged in. To be specific, it is about the West African's free trade area component of ECOWAS, the European Union – African, Caribbean Pacific group of states (EU-ACP) agreement and the African Growth Opportunity Act (henceforth AGOA). For achieving that goal, detailed data on firms' exports would be suitable, but unfortunately, the availability of such data covering a long-time period is not available yet. Therefore, we use SITC 4-digit revision 1 classifications from the World Integrated Trade Solution database combined with geographical data and country-specific characteristics data.

From our knowledge, evaluation of EIA in West Africa has been assessed using gravity models or general equilibrium framework. For instance, Tinta (2017) uses a gravity model with a panel fixed effect specification to examine how ECOWAS countries participate in the global value chains (GVC) in international trade. Others but not all, such as Assane & Chiang (2014), Cerutti et al. (2014) or Luqman, Abu Bakar, & Izraf (2016) analyze the integration of trade in ECOWAS using different methods and dataset. The gap of these studies comes from the lack of clear conclusions related to how long an export relationship remains active across years for a specific product under a specific agreement.

The need for trade facilitation is crucial in Africa than in other parts of the world. The African Continental Free Trade Agreement (AfCFTA) is meant to bring complete movement of goods and to increase continuation of trade within the continent. This agreement will serve as a channel to improve exports, imports and more importantly reduce poverty. One may question the ability to

[1] ECOWAS: Economic Community of West African States, created since May 1975.

reach these goals if different trade relationships are short-lived. This study contributes to the literature by giving empirical evidence to the policymakers on how trade agreements could improve or reduce the way trade ties persist over time. Basically, the fact that two countries are involved in a trade relationship can help them increase the basket of goods available in their area. It could also enable innovation as some partners will initiate goods of the same range on the path to create substitutes for a particular imported good. Competition in the international market could also provide a framework for exporters to use modern technology via technological transfers, which in turn increases productivity. Challenges in Africa's trade remain, with a big part linked to infrastructures and the quality of institution in the continent. Therefore, identifying the influence of relevant variables under different trade agreements is vital to provide sustainable policy that helps the continent catch up with other regions in terms of trade integration. The objective of this study is to assess the effects of EIAs on exports duration in West Africa. To be specific, the study analyses export duration for trade relationships that start before an agreement, those that started when the agreement enters into force, then this agreement that started after the agreement enters into force.

However, it is well known that trade relationships are short-lived (Brenton et al., 2010; Nitsch, 2009) either in developed or in developing countries. In terms of policy recommendations, policymakers undertake reforms and negotiate agreements that enhance both intensive and extensive margins of trade within the continent. Amongst several goals, attracting foreign and private investments in trade as well as increasing the volume of trade, in general, are placed among the key development strategies of African governments. However, few attentions have been retained toward the sustainment of trade relationships.

The rest of this paper is structured as follows. In section 2, an overview of ECOWAS agreements is provided. In that step, the paper informs on the historical route that the regions have taken till recently. Section 3 reviews literature. Section 4 describes the theoretical and empirical methodology. Section 5 presents the main results of the study while Section 6 concludes by providing some policy recommendations that could be useful.

2.0 Overview of ECOWAS trade agreement initiatives

Economic integration agreements have been used for a long time to reduce market failure and increase economic growth (Baier, Bergstrand, Egger, & McLaughlin, 2008). Many agreements have been initiated both in developed and in developing countries to boost the wealth of their members. One of such trade agreements is the the Economic Community of West African States (ECOWAS), an RTA initiated in 1975 by fifteen members which are Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo (Mauritania withdrew in 1999).

Many initiatives for trade and integration have been implemented and have been focused on the free movement of people and goods. Back in 1979, the ECOWAS Trade Liberalization Scheme was already in force and investments have increased to reinforce the effectiveness of integration goals within the region. That agreement's impact on intra-ECOWAS trade flows is estimated to be positive and increasing over time, while its impact on its members' exports to the ROW (Rest of the world) is negative and decreases over time. During the first ten years of the existence of the RTA (Regional trade agreement), its impact on its members' imports from the ROW was estimated to be positive, but this result was reversed after (Mamba and Baliki, 2023). The overall trade impact of ECOWAS is thus ambiguous (Uko & Ebong, 2023; Adda et al. 2024). With the objective of reinforcing economic integration, the common external tariffs were introduced in 2015. Under that framework, tariffs were consolidated for some products that could allow countries to have a common treatment regarding imports from outside the region and boost trade within the region. Nonetheless, export volume was declining since 2013 to take off back between 2016 and 2019 to reach 25 percent of the regional GDP.

The region is active in the international market and different agreements signed benefited its country's members. For example, the Cotonou Agreement was signed by 78 countries since 2000 and gives birth to an economic partnership agreement. That agreement was initially due to expire in 2020, but its application was prolonged until 2021. However, in 2020 the African, Caribbean, Pacific (ACP) Group States becomes the Organization of African, Caribbean, Pacific States (OACPS). Previously granted as a non-reciprocal trade preference, the agreement allows reciprocal trade preference for both groups of countries. The main feature is that least developed countries in the agreement have free entry to European countries. However, the new EU-OACPS framework considers new realities and aspirations of parties, and in that matter focuses on building larger markets, greater interconnectivity, free movement of goods, persons, labor and technology. It is also important to mention that ECOWAS, which is part of the OACPS, used as main trade integration tool the Economic Trade Liberalization Scheme (ETLS) that aimed to reinforce trade between members.

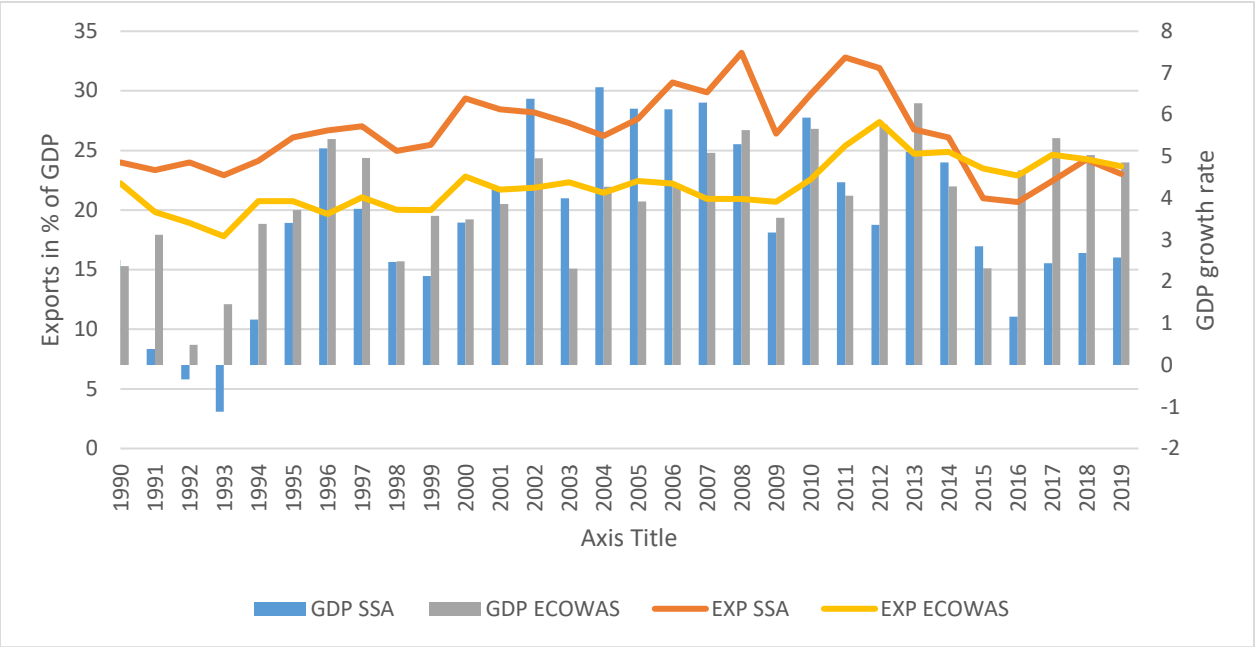


Figure 1: Exports growth and Economic Growth

In that perspective, Figure 1 compares exports evolution and economic growth between West Africa and the Sub-Saharan Africa region. Early in the 2000s, SSA exports were higher than the ECOWAS one and that pattern continues until the year 2013 – 2014, where both were almost equal. From that period up to 2018 ECOWAS exports remained above the African average. One could interpret that as the good integration of West African countries to the global economy. However, it is relevant to mention the lack of heterogeneity in this graph, which hides several characteristics in terms of products and origin countries. Economic growth also follows the same path as exports for both groups. Economic integration has helped some country members to increase their economic growth while others have not yet reached the necessary requirements needed in the regional convergence criteria. It is also worth noting that exports from Africa in general has experienced hurdles relative to non-tariff barriers, especially toward Europe and Northern America.

However, since 2000 the US Government has enacted the African Growth and Opportunity Act (AGOA) agreement, which has been renewed to 2025. The agreement enhances market access to the US market for qualifying African countries that must respect a set of conditions. Among these conditions, the rules of origins applied require that products must be produced or manufactured within the beneficiary country. Thus, these rules stated that at least 35 percent of the appraised value of each product exported to the US port must be manufactured or processed in a beneficiary country. Specific attention is also paid to textile and apparel industries, which have different rules of origin. The agreement has surely influenced total exports to the USA, with ECOWAS's exports

increasing from $6.5 billion in 2002 to $6.8 billion in 2021. The higher export values reached $39.7 billion and $36.5 billion dollars, respectively in 2008 and 2011[2]. Countries lost eligibility to access the US market, which in turn influenced the survival rate of different trade relationships involved. In addition, there is evidence that African countries do not use the full potential to access the US market. That also reveals the importance of non-tariffs barriers to trade such as technical barriers to trade.

Even though trade agreements have influenced export growth the question of how they have contributed to sustaining each export relationship over time remains. Further, we provide a quick glance at how exporters involved in international markets from West Africa[3] behave. Table A1 in the Appendix presents number of exporters, number of new recruits and the export value per exporter. At the 2-digit level of Harmonized System (HS02), the table shows some descriptive statistics on few sectors. For example, the number of exporters grows by almost 20% and 10% for oils seeds and pharmaceutical products, respectively over the period 2007 – 2011[4]. However, the export value declines steadily in those two sectors. The exporters of "Iron and Steel" remain stable over the period while there is a higher volatility in the "Cocoa and cocoa preparations" sector. One reason could be the fact that two major cocoa exporters in the world, namely Cote d'Ivoire and Ghana, are active members of the region and political and economic frictions in these countries could be responsible for different volatility episodes in that sector. The export values have shown the same path over the period.

There is a relatively high number of new entrants as well as survivors in the next years. Generally, exports in West Africa are dominated by few exporters, compared to the number of firms registered in ECOWAS on average. Considering reforms undertaken in trade facilitation within the region, there is a high likelihood of witnessing a boost in the number of new entrants. One question this study answers is the duration of the trade after entering exports markets, and how existing exporters have been impacted by different trade agreements.

3.0 Related literature

For a long period of time researchers have used gravity models to explain the effects of economic integration agreements on international trade. Most studies have used dummy variables to track each pair of countries involved in a trade agreement. The main conclusion shows that EIA plays a

[2] ECOWAS - Agoa.info - African Growth and Opportunity Act

[3] Data stems from the export dynamics database. Only Burkina Faso, Cote d'Ivoire, Mali, Niger and Senegal were covered. Some countries like Senegal – 12 years – has longer series while the remaining has four years covered on average.

significant role in trade creation. That is, it is useful to intensify export margins in a bilateral context (Baier, Bergstrand, Egger, & McLaughlin, 2008; Carrère, 2006; Magee, 2008). However, new contributions to international trade literature are mainly focused on the heterogeneity and the role of firms (Melitz, 2003) as well as on trade duration (Besedeš et al., 2006; Nitsch, 2009). The former line of research contributes by examining the importance of firms' characteristics on the extensive and intensive margins of export dynamics. Some authors like Baier, Bergstrand, & Feng (2014) investigate the effects of different EIAs on trade margins. EIAs impact both intensive margins and extensive margins of trade even though their effects are different across time and countries.

As far as trade duration literature concerned, it is still nascent and developing. Besedeš & Nitsch (2013) seminal works provide a theoretical framework to explain the effects of integration agreements on trade duration and growth of export. Prior to them, the theoretical background for trade duration was referred to as the product cycle theory, Search and Matching theory and product switching theory as the basis of empirical debate. According to the product life cycle theory by Vernon (1966) a product is introduced, developed, consumed and exported by an advanced economy, which benefits a high ratio of skilled workers. At some point in time that product reaches a maturity age when developing economies start producing the product and further export it to the developed economies to take advantage of the cheaper labor force. It could be tempted to associate the end of product life to trade relationship end but it fails to fully explain the short-lived relationship in practice (Besedeš et al., 2006; Hess & Persson, 2011).

Another theory referenced as a theoretical background is the search and matching theory developed by Rauch & Watson (2003). They explain that trade duration depends on buyers' behavior on the international markets, which they record in three phases. In the first stage, the buyer looks for suppliers, most often from a developing country, to establish a match and start trading with a small number of orders. Then in the second stage, if the buyer finds the seller reliable, an investment can be made to increase volume traded. In case that reliability fails the relationship ends and the buyer looks for another match. In case the relationship continues, in the third stage a substantial investment will be made to tie the relationship. The probability of exports dying early depends on the amount of failure realized in the first and second stage. Furthermore, the product switching theory mainly relies on firms' activities in the international market and highlights the key role played by the import country demand market (Bernard, Redding, & Schott, 2010). A negative demand shock is more likely to trigger a stop of trade relationships than a positive shock. Those trends in product switching are correlated to trade duration.

3.1 Determinants of trade duration

At the firm as well as the country level many variables influence the probability of trade relationships to cease. Both time-variant and time-invariant variables have a significant impact on trade duration. Amongst others, market access costs, real GDP, distance, exchange rate

misalignment, colonial ties, common border, and common language are critical for trade duration (Cadot, Carrère, & Strauss-Kahn, 2014; Chacha & Edwards, 2017; Hess & Persson, 2012; Mohammed, 2018). Each determinant of trade duration has a different mechanism whereby they influence the hazard rate. Türkcan & Saygili (2019) especially find that for the case of Turkey exports, market diversification has a lower effect on export survival than product diversification for example. This is a finding that is opposite of another study by Amurgo-Pacheco et al. (2008) [5] who find that at the extensive margin, geographic (market) diversification is more important than product diversification. Nonetheless, distance taken as physical trade costs reduces the survival rate. Another important determinants are the quality of institutions, political risks, corruption, value chains and economic agreements, which will be reviewed below (Araujo, Mion, & Ornelas, 2016; Esteve-Pérez et al., 2013).

3.2 Exports duration and economic integration agreements

One of the important goals of trade agreements is to give preferential treatment to its different members by increasing exchange volumes. A trade agreement is expected to increase trade flows through the reduction of trade barriers and through the reduction of competition for a specific product in each market. In that context, Besedeš & Blyde (2010) argue that trade flows are more stable with EIAs, which in turn is more likely used as a channel for the export duration.

However, the effect of trade agreements depends strongly on the EIA type and the product characteristics under such agreements. Saygili & Türkcan (2017) explore export survival in the machinery sector in Turkey. Using export data from 1998 to 2013, their analysis focuses on different economic integration agreements and how they can impact the survival of trade. In their approach, the authors differentiate between Final Products and Part and Components within the machinery exports. Then, vertical differentiation has been involved to deepen the analysis in terms of product differentiation. They conclude that Preferential Trade Agreements (PTA) and N-R PTAs increase survival exports of Parts and Components than Free-Trade Areas (FTAs).

In the same vein, following Besedeš & Nitsch (2015), Recalde *et al.* (2016) examine whether EIAs improve survival of trade relations in Latin American countries over the period 1962 – 2009. The authors distinguish between trade relationships (spell) which started before the agreement, during the agreements, and after the agreement. In general, the findings highlight that FTAs and Custom Union (CU) increase duration of exports. Their method differs from Besedeš & Nitsch (2015) by providing effects of different agreements by spells starting date. Spells starting after an agreement are likely to die faster if PTA is in-force while results are converse for FTAs and CU. As far as the

[5] *"Amurgo-Pacheco, Alberto; Pierola, Martha Denisse. 2008. Patterns of Export Diversification in Developing Countries: Intensive and Extensive Margins. Policy Research Working Paper; No. 4473. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/6447 License: CC BY 3.0 IGO."*

spells which started before an agreement are concerned, results show that the survival rate increased for all EIA, but the magnitude is higher for FTAs and CU.

Within the trade literature, it is well documented that trade costs are reduced with EIAs (provide references). For the case of Kenya, which is engaged in EAC and COMESA[6] RTAs, Socrates (2016) finds that EAC membership increases significantly export survival while the coefficient for COMESA membership is not significant. Further Chacha & Edwards (2017) examine the export survival of Kenyan firms using the Cox Proportional Hazard model and a panel logit with random effects and fixed effects. The results show that exporting to COMESA countries member improve exports survival of Kenya firms.

A more comprehensive analysis for the African context comes from Kamuganga (2012) who examines all agreements on export survival in the continent. By categorizing trade agreements, the author finds that deep trade cooperation increases Africa's export survival. By analyzing deeply, the effect of trade cost he also finds that costs to exports reduce export survival while financial development increases African export survival for countries engages in a customs union. The author also mentions the importance of intra-African trade and its importance for export survival. However, the author uses the Cox Proportional Hazard Model to evaluate export survival, which is likely to suffer from three main specification problems such as ties duration times, unobserved heterogeneity and proportional hazard (Hess & Persson, 2012).

In this study, we use a discrete-time model to overcome the issues noted above. We also track the starting and the end of an agreement like the AGOA and their effects on the survival of exports in ECOWAS countries member.

4.0 Methodology

4.1 Theoretical Background

A trade agreement is useful because it reduces prices for countries involved in that agreement and increases relative costs of the signing countries vis-a-vis third countries. In fact, the link between a trade agreement and the duration of trade is not always straightforward. Even though Fontagné et al. (2021) point out different impacts of trade agreements depending on the provisions they are involved, the broad consensus is that they help reduce trade costs. Further, these cost incentives trigger more entry into the international market both for exporters and importers in these countries. However, it is also important to note that firms that have existing trade relationships will have more room to either increase the volumes exchanged or continue investing in these countries to get others input they used to get from other markets, at a lower cost. Of course, in this analysis it is assumed

[6] EAC, East African Community; COMESA, Common Market for Eastern and Southern Africa

that each firm has sufficient productivity capacity to make the decision to increase the exchange volume. Figure 1 below highlights the fact that under an agreement new trade relationships can be created, or the existing ones can be reinforced. However, for a third country not involved in that agreement it could be relatively expensive to continue trading with countries in agreement, depending on whether the same goods are concerned.

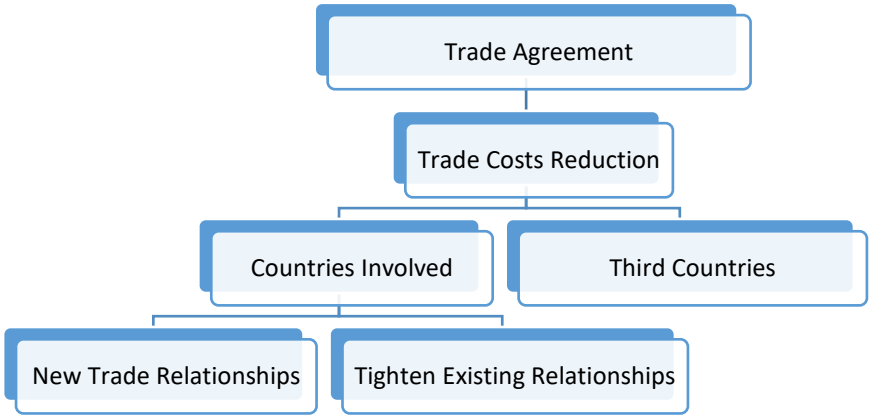


Figure 1: *Theoretical linkage between trade agreement and export duration*

The nascent literature on the duration of trade was based on different theories to justify the application of different empirical specifications. Here, we follow the approach developed by Besedeš & Nitsch (2013). Let us consider a trade relationship, which involves two countries: an *origin o* country and a *destination d* country. We have sellers, firms in the country of origin, and buyers, firms in the destination countries. A trade spell is a time during which the trade relationship is active, without omitting that a trade relationship itself is a set of origin-destination relationship for a given product.

We assume in the starting point that a seller identifies a buyer in the destination country and initiates the matching procedure to start selling its product. We also assume that a possible match is realizable, and a potential buyer appears following a Poisson process with λ as a parameter. If the match succeeds, the trading relationship is active for an exogenous, z, a period with a distribution $H(z) = 1 - e^{-z/\mu}$ with μ the mean. After period z, that relationship stops.

Here we are interested in the impact of trade policy on the volume of trade. We consider the probability that a seller enters *d market* is θ and the size of the relationship is randomly distributed with *F(w)* where *w* is the seller's revenue.

Further, a particular product is sold in the destination country relative to per-unit trade cost $\tau > 1$ and a fixed costs f_E to set up an operation in the destination country. Heterogeneity within the sector by producer's productivity level δ. Therefore, the revenue gained by the exporter and its

probability of entering a destination market depend on its performance, fixed costs and per-unit trade cost. That is represented by $\theta = \theta(f_E, \tau, \delta)$and $w = w(f_E, \tau, \delta)$.

Trade liberalization is represented in two ways either by the reduction of trade cost $\tau > \tau'$ or by the reduction of the fixed cost $f_E > f_E{}'$. That reduction could be an opportunity for non-productive firms to enter the international trade market, which in turn could reduce the survival rate.

Trade spells and economic integration agreements

We define $v_k(t)$ as the probability that a trade relation has exactly *k* business relations at time *t*. that probability can be expressed by[7]:

$$v_k(t) = e^{-\theta_\rho(t)}(\theta_\rho(t)^k)/k! \qquad [1]$$

Which is a Poisson distribution with parameter $\theta_\rho\ (t) = \theta\lambda\mu(1 - e^{-t/\mu})$. It also reflects the probability that *k* sellers have succeeded in matching a buyer in a destination country. In the long run, $\rho(t)$ approaches $\mu\lambda$ and the distribution becomes $v_k = e^{-\theta\lambda\mu}(\theta\lambda\mu)^k/k$. That is, when the time approaches infinity, the probability to have exactly *k* spells depends on the probability of entering the destination market and the parameters associated with the bid process generation.

Further, the effects of trade agreements on the survival of trade are characterized in Figure 2 below. We present three different effects by the starting date of a spell for a specific product involved in a trade.

[7] One can find a more detailed derivation procedure in (Besedeš & Nitsch, 2015)

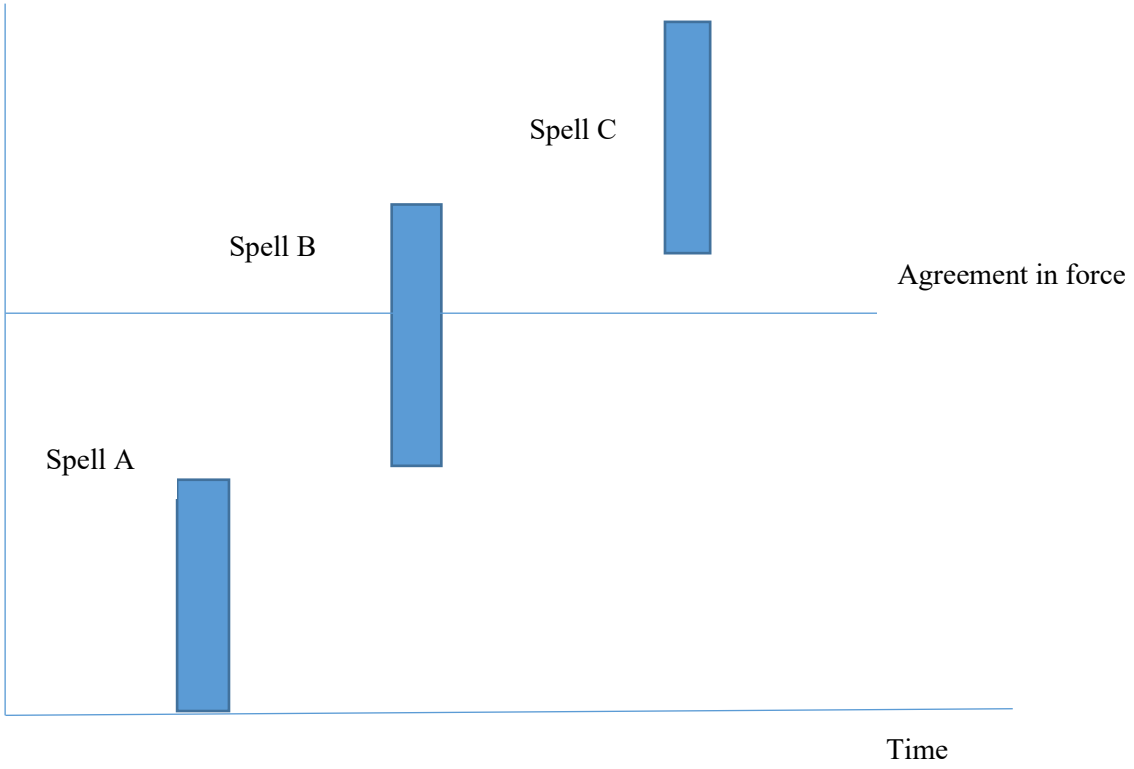


Figure 2: Duration of trade relative to EIA

Trade liberalization allows an increase in firms in the internal market as well as increasing the size of those already in the international market. However, the trade dynamics before and after an agreement are closely related to the impact of its agreement on trade spells. There are spells like spell A which are non-affected by the agreement. Some spells such as spell B started before the agreement and continue after that one. In some cases, like spell C, after the agreement is in force the trade cost is reduced, which increases the probability of participation of less productive firms in the international market. In conclusion, trade liberalization increases trade spells that started before an agreement. These spells start after having a shorter duration in duration regarding the volume exchanged or their growth rate. One of the objectives in the next section is, therefore, to show how to assess different trade agreements in ECOWAS on their trade spells.

4.2 Empirical specification

In this study, we apply a discrete-time model in our study. The survival analysis method used to investigate the duration of the trade can easily deal with ties in duration, control for unobserved heterogeneity. The advantages of such models, over continuous-time models, are that they do not assume a proportional hazard, meaning that the assumption of the hazard rate depending on the covariate and constant overtime is not made (Hess and Persson, 2011, 2012).

We define the event of stopping exporting to a particular market as a failure. Let T describe the time for a trade relationship, with T being a discrete random variable. The survival function is expressed as:

$$S(t) = (T > t) = \sum_{t_i>1} p(t_i) \qquad [2]$$

Then, we also define the hazard rate as the probability for a trade relationship to continue between times [t, t+1], given that a failure has not happened since the starting point of time. This conditional probability is written as follows:

$$H_I(t, X) = \Pr(T_i < t_{i+1} | T_i > t_m) = 1 - \exp\{-\exp(\beta' X + \gamma_t)\} \qquad [3]$$

where X is a set of both time-varying and no time-varying variables that are assumed to influence the hazard rate; γ is the baseline hazard rate for the *t*th interval that allows the hazard rate to vary with time, and β is a vector of coefficients to be estimated. A negative (positive) sign of the coefficient means a lower (higher) rate of failure and therefore a higher (lower) probability of trade survival.

A set of dummy variables is added to take care of the duration intervals of each spell since the underlying baseline hazard is unknown. Empirically, a Gaussian error term is introduced as a random-effects indicator that deals with the problem of unobserved heterogeneity (frailty). Concretely, region and year fixed effects are also included to control for endogeneity problems. We estimate the discrete-time proportional hazard model by maximizing the following log-likelihood function:

$$lnL = \sum_{i=1}^{i} \sum_{t=1}^{t_i} [y_i \ln(h_{it}) + (1 - y_i) \ln(1 - h_{it})] \qquad [4]$$

where t_i are the terminal period and the underscore *i=1,2,…,n* refers to the terminal point in time, which varies for each origin-destination pair. y_i is the binary dependent variable which takes the value one if the failure occurs for a country pair at a particular year and zero otherwise. A positive (negative) coefficient indicates that a particular explanatory variable reduces (increases) the survival of the spell.

We estimate equation [4] with a logit model as follows:

$$y_{odt} = \beta_0 + \beta X_{odt} + \gamma EIA_s + \pi D_{odt} + \varepsilon_{odt} \qquad [5]$$

where, y_{odt} is the hazard rate with o the origin and d the destination country, EIA_s is a set of agreements in which ECOWAS countries members are engaged in while s records all countries involved in an agreement over time. X_{odt} is a set of time-variant and time-invariant variables that influence the dependent variable. $D_{dt}$is a set of time, destination, and spell dummies inserted to control heterogeneity.

There are different types of trade integration agreements. The impact of a bilateral agreement could be different from a multilateral or a regional one. There is also a difference between reciprocal and non-reciprocal trade agreements such as ACP-EU and AGOA, respectively. In the specification, we overcome the issue of left censoring of spells by excluding the year a spell has started. The main reason is the lack of clarification on whether the country started the trade this particular year or earlier. As far as the right censoring issues are concerned, the survival model automatically solves it (Zhu, Liu, & Wei, 2019). The case of multiple spells is also considered by creating a dummy variable.

4.3 Data

We use annual country-product-destination data from the World Integrated Trade Solution (WITS) database on exports from ECOWAS countries over the period 1962 to 2018. The data is at the 4-digit level classification of the Standard International Trade Classification (SITC) revision 1. This dataset is useful to assess export survival before and after the decision to form a regional agreement. In addition, we use data at 6-digit level Harmonized System from the same source to assess different agreement impact. The main reason is that using SITC data will generate bias in results because international trade was under other trading systems, such GSP for example.

Import records of destination countries are used as mirror data because they are more reliable, especially for developing countries trade statistics (Brenton et al., 2010). In addition, we use country-specific data from the World Development Indicators database as well as gravity variables from CEPII (Centre d'Etudes Prospectives et d'Information Internationales) database. A detailed definition of variables used is provided in the appendix. The data covers a long period of time, and it is an advantage for it allows considering the effect of integration agreements as ECOWAS itself and others like EU-ACP and AGOA for each country members.

5.0 Empirical results

5.1 Descriptive analysis

In this section, general patterns of export duration from ECOWAS members are assessed. Table1 explores the number of spells expressed in percentage, by each exporting country. A distinction is made by two different agreements as well as exports towards sub-Saharan Africa countries. Under AGOA agreement, Ghana, Nigeria, Cote d'Ivoire and Senegal have exported more products (more than 10 % of all spells), with the higher figure recorded by Ghana (24%). This pattern is also witnessed for export under ACP-EU agreement. This implies that these countries dominated exports in West Africa. This is evidence as they are the economic driving force of the region with higher GDP since the last decades. It is also worth noting that they are coastal with an increasing investment in developing their port infrastructure, over the years. Nonetheless, when one considers exports toward African countries, Cote d'Ivoire records the highest share of trade links, with 19%, followed by Nigeria (18%), Senegal (16%), then Ghana (15%). Togo has a considerable number of intra trade with almost 10% of total links.

Table 1: Number of spells

	AGOA	ACP-EU	SSA
Ghana	24.15	16.49	15
Nigeria	15.74	15.66	18.17
Côte d'Ivoire	10.47	16.11	19.01
Senegal	10.25	13.01	16.21
Sierra Leone	9.64	6.02	1.3
Mali	7.80	5.31	4.12
Niger	5.62	3.74	3.48
Guinea	4.62	3.19	1.72
Burkina Faso	2.91	4.73	4.18
Cabo Verde	2.37	4.48	0.42
Togo	1.93	4.34	9.76
Benin	1.86	3.07	4.22
Gambia	1.45	1.91	1.23
Liberia	1.05	1.47	1
Guinea-Bissau	0.14	0.49	0.2
Total	36636	435799	889,543

These figures describe the importance of trade links in west Africa, but one might question the value of these links. For trade links with small values on average, it is hard to grow over time, especially if the destination is the least developing country. Therefore, Figure 3 displays in percentage the volume exported by each country under ACP agreement, over the studied period. A

difference is made between all exports and exports without oil. The exported value for Nigeria for example is highly influenced by oil products. When oil is not considered the exported value drops to 19% of the total of export value. Without oil and fuel product Cote d'Ivoire and Ghana stand almost at the same level (30.2% and 30%, respectively). Apart from these four countries mentioned above, other exporters, either located at the coastal or in the hinterland, do not achieve 5% of the overall exports. This could be explained by the size of these economies or by their utilization rate of this agreement, or even by their poor integration of the global value chains.

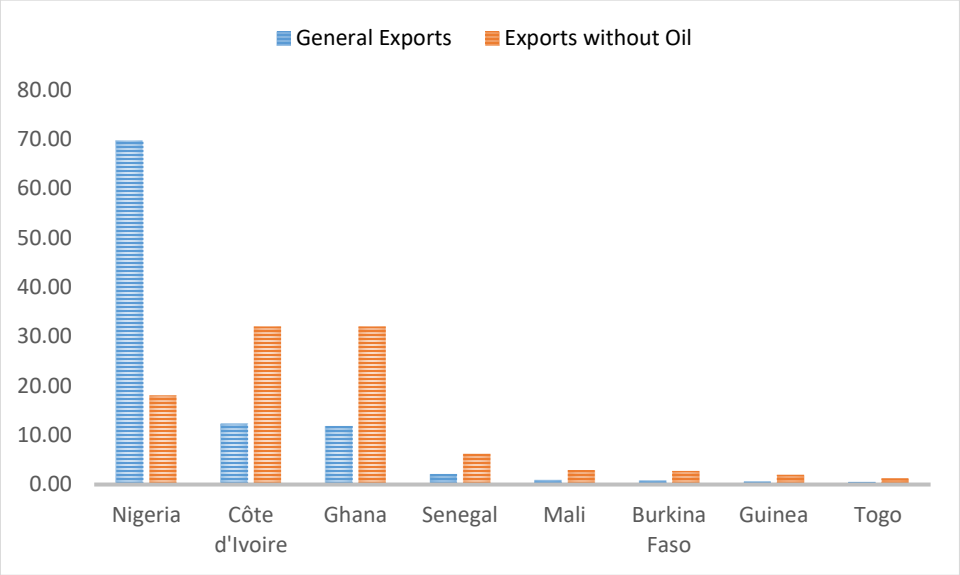


Figure 3: Exports Under ACP-EU

Furthermore, we explore the same export pattern under AGOA. This agreement provides preferential access to the USA market, mainly for countries in sub-Saharan Africa. Some of West African countries have been withdrawn that access for some years before being reintegrated.

Considering all these facts, figure 4 presents exports under AGOA, both globally and exports without oil and fuel. As recorded above, Nigeria is the top exporter under AGOA, with it share that represents 68% of the total exports. It is followed by Ghana and Cote d'Ivoire with respectively 17% and 8% of the total. Other countries have a share that is below 5%, but these revenues are very important for their development. This figure also highlights the weights of oil products in African exports because without oil and fuel products countries like Nigeria do not exports as much as 17% of all exports. Ghana is the top exporter under AGOA followed by Cote d'Ivoire and Senegal. Of course, other countries still record low values, but the exported value is much higher than exports counting oil and fuel products. For example, Kitous et al. (2016) underlined the importance of oil exports for African countries and how international prices can affect both economic and political stability.

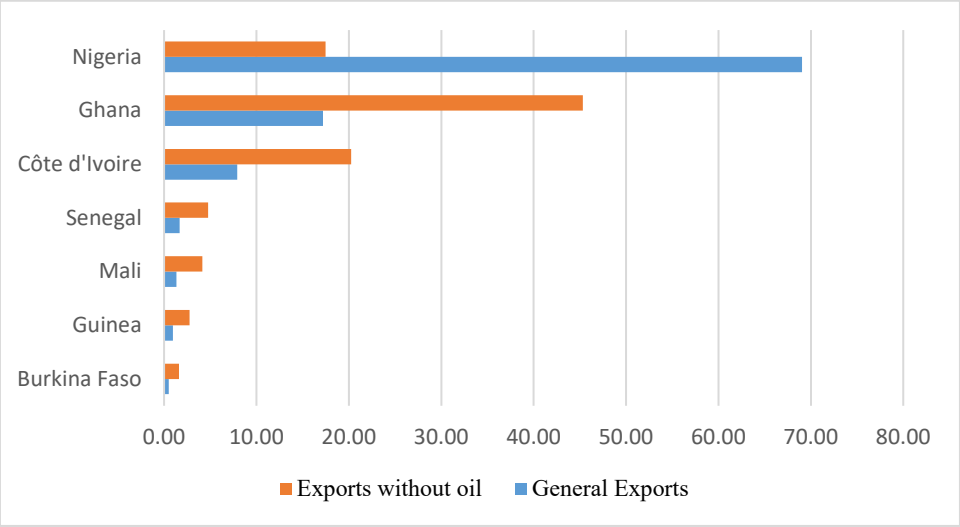


Figure 4: Exports under AGOA

Figure 5 displays the product exported under ACP agreement. The left-hand side figure presents top product exported without oil and fuel, while the right-hand side presents products exported containing oil. The general trend shows that exports are mainly driven by oil and fuel, which account for 47% of all exports. When we withdraw oil away, we find that the European Union countries import more natural pearl (32%), cocoa (20%), or wood and wood materials (10%). It is worth noting here that we consider the overall picture and do not point out how each product has evolved over time.

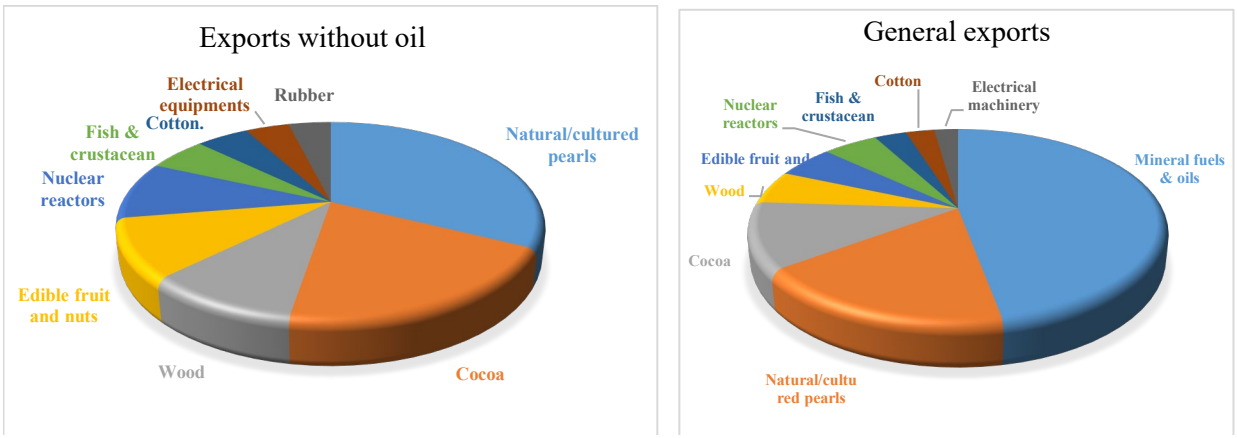


Figure 5: Products Exported under ACP-EU

This figure also shows that West African countries do export less manufacturing finished or intermediate products toward Europe. This may be the consequence of low industrial development in the region. This analysis does not dig deeper into the economics that each country plays around each product, but it is worth noting non-tariff barriers imposed in some export sectors. With the renewal of the ACP-EU agreement to incorporate more sustainable development objectives, expectations arise around a future growth of non-oil exports toward Europe.

For the case of AGOA, figure 6 presents products exported from west Africa, in general. The figures show again the importance of oil and fuel products in total exports. It also shows the same patterns as exports under ACP_EU agreement. This implies that the exporters from these countries do not diversify their production but instead export the same product toward many destinations. This analysis raises the question of the sustainability of each export relationship over time. Specifically, how these exports survive under these different agreements and how they do perform in different destinations.

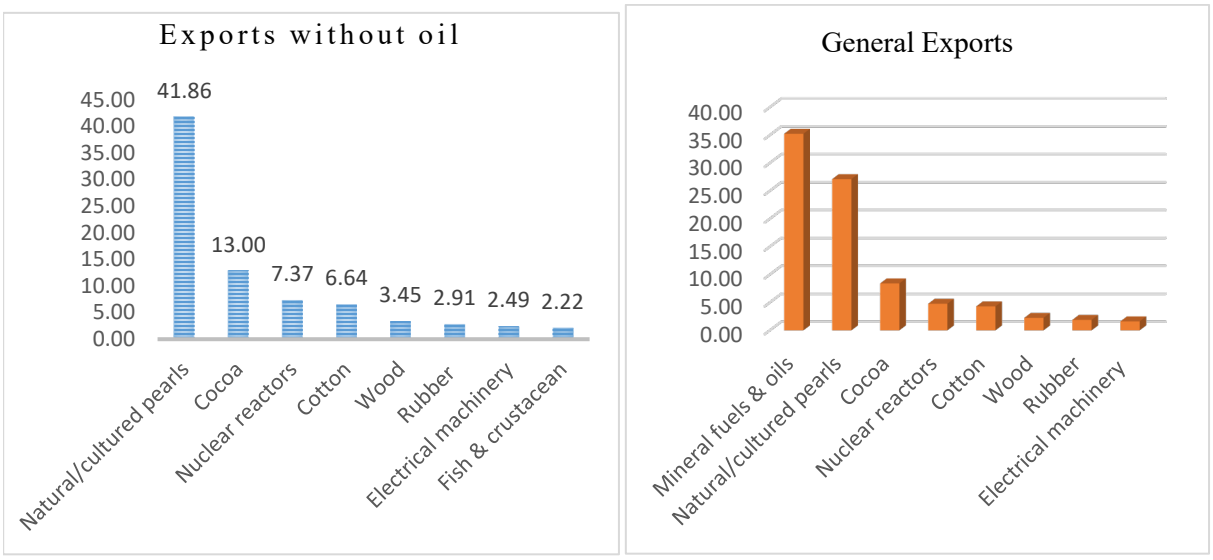
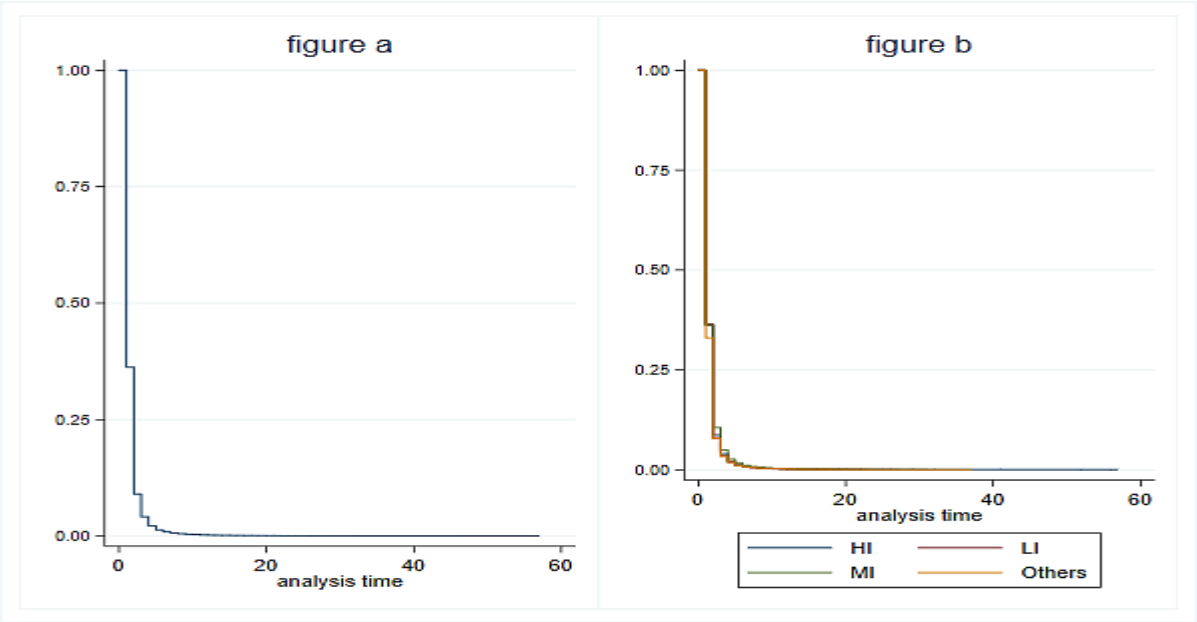


Figure 6: Products Exported under AGOA

Furthermore, the Kaplan-Meier analysis of export spelling suggests that 30% of our sample continue after the first year. Only 5% is estimated to survive after the fifth year across the studied period. In Figure 7a, a global perspective on our data is presented while survival analysis by income group of the destination markets is a graph on Figure 7b. We found that on average, 64% of exports to high-income countries die after the first year, which is almost the same for exports toward the middle-income country group. Exports toward low-income countries have the lowest survival rate in the first years with 68% dying after the first year and 98% do not reach the tenth year. Many reasons could explain that picture but in general exports from Africa tend to have a lower survival rate.



Note: HI = High Income, MI = Middle Income, LI = Low Income,
Figure 7: Exports survival analysis in general and by destination markets income group

As mentioned by Besedeš & Blyde (2010) there are many factors that could explain the length of a trade relationship. Most gravity model variables, such as GDP and distance, explain significantly the hazard rate. As regards GDP, exporting to a larger market reduces the probability of existing as such market provides a larger pool of buyers that reduces existing risks in case of potential fluctuation in demand. Distance could also influence the hazard rate because the longer the distance the likelihood of experiencing delays and cancellations could be higher. Adding to these factors, internal infrastructures and competition among shipping companies are important factors as well (Hummels and al. 2007). Shipping companies' competition with inadequate auxiliary services could on the one hand reduce prices but on the other hand cause delays or damage to the merchandise. For a new entrant in that market, it could be difficult to have a long-term contract. In addition, other factors, but not all such as common language, exchange rates, product characteristics influence the survival rate. For example, products whose import demand is very sensitive to prices could be involved in short-lived trade relationships.

Furthermore, we estimate the length of export spelling within the first tenth years under ACP-EU and AGOA. For that purpose, we restrict the data from 1990 to 2018 and use only products involved in those agreements. Indeed, there is no equal treatment for all countries, and we do consider only products involved in the agreement for each country. Moreover, we consider the fact that many western African countries have been granted market access by the USA authorities while some have been ineligible. Under the conditions contained in the agreements some countries have been

withdrawn the right to benefit from the AGOA before being reconsidered later. Guinea, Niger and Cote d'Ivoire are few examples in West Africa.

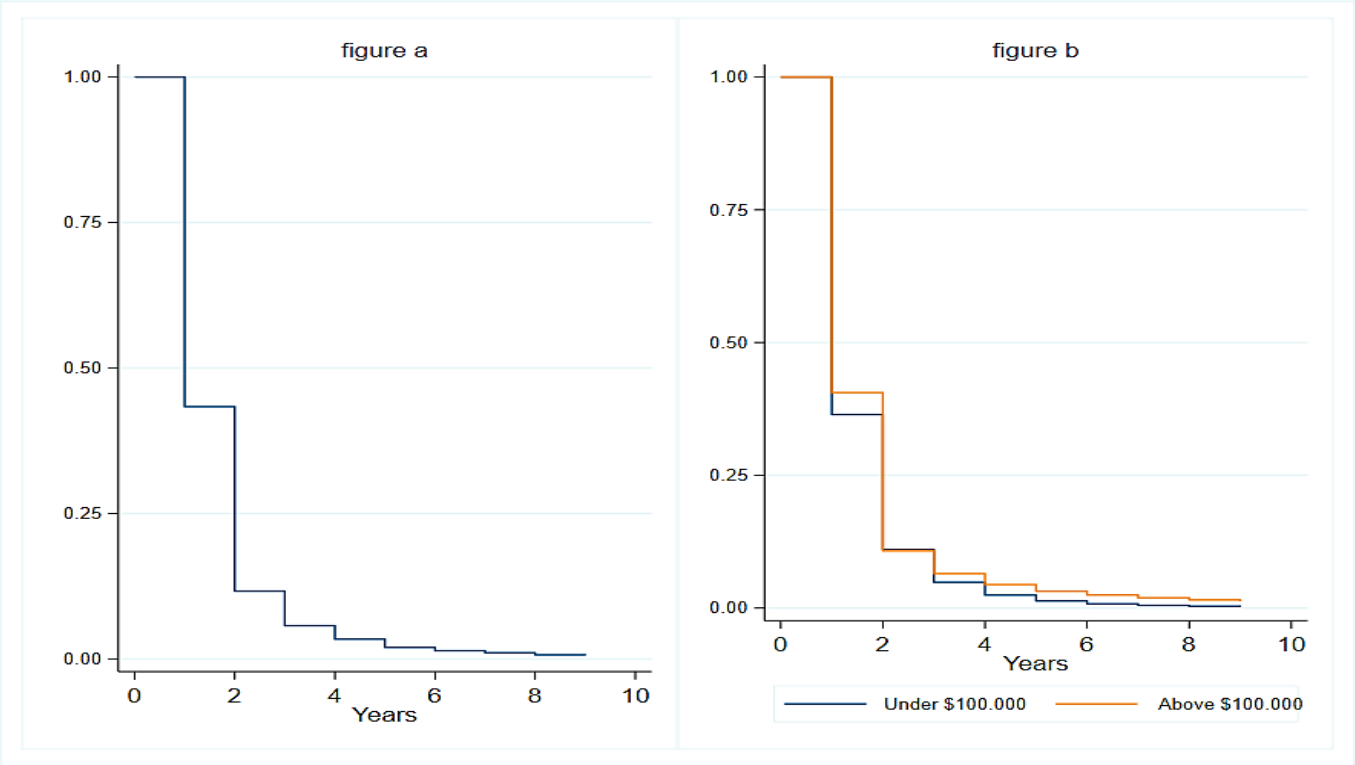


Figure 8: Exports survival analysis under AGOA and under ACP-EU by trade values

On average 43% of spells under AGOA survive after the first year of existence while only 2% survive the fifth year (figure 8a). For example, some African businessmen argue it is difficult to penetrate the United States market. Although tariffs and financial conditions have been reduced. A deep look at what ECOWAS exports to the USA shows that between 2018 and 2019 exports to the American market grow from 150 million USD to 155 million USD. However, under AGOA (including GSP provision) exports grew from 34 million to 54 million USD[8]. That increase has been driven by agriculture products, which reached 33 and 53 million USD under AGOA in 2018 and 2019, respectively.

There exists high level of administrative requirements that sometimes prevent exporters from sustaining activities. For exports under ACP-EU agreement we differentiate them by a threshold of one hundred thousand US dollars. Figure 8b shows that 89% of spellings die after the second year and 1% reach the seventh year, for exports under the threshold considered here. On the other

[8] Data stem from the AGOA online information portal. http://www.agoa.info/profiles/ecowas

hand, exports with huge values tend to survive longer, which lead to the fact that the data used has been constrained within a particular interval of time.

Such results show how exports from ECOWAS countries are very short-lived, especially toward countries outside the continent, even though the region has a long culture of economic integration agreements with its trading partners. There exists heterogeneity among the exporters as well as among the product exported. The findings above might hide some specificity of spell but give a clear picture of the regional trend in terms of export survival. Many factors could clearly explain those trends and that is what we explore in the next section.

5.2 Main results

In this section the main findings are discussed as well as different specifications used for obtaining these results. We start the discussion by presenting specifications used in the empirical analysis. In column (1) we present country-specific variables, where cost of imports and exports are not used. The results do not depart as much from literature as distance has a negative influence on the duration of trade. Having a common language and sharing the same borders, especially for countries that are not part of the union, do improve trade relationships. It is worth noting at this stage that the date range allows us to analyze the situation through different development stages. Therefore, the GDP of partner countries improves the duration of trade. Gravity variables do not only impact the volume of trade, but they also impact its duration. Without any specification, financial development does not improve exports duration from Western Africa countries. Though, its coefficient is significant at lower percent.

In another specification (column 2), we add the cost of imports, cost of exports as well as urbanization rate. In addition, this specification considers trade involving ECOWAS and Europe and Central Asia countries. Conversely to what the literature says, results show that distance has a positive influence on the duration of trade. This may be justified by the fact that these countries are among the top trading partners of the region and have developed specific communication infrastructure to allow the smoothness of trade. One explanation could also be the fact that goods trade with the European Union are mainly based on agriculture or raw materials. Their importance makes it difficult for an importer to easily consider distance or the delays in supply as a main decision to stop the relationship. Cocoa and cocoa preparations products have been the top exports to European Union countries between 2013 and 2019, with the highest value reaching $4.4 billion USD in 2015[9]. Their financial development influences positively duration but the coefficient is not significant. Their cost of exports and imports does not improve duration, even if only the export

[9] Data can be consult on the Trade Data Monitor platform. www.tradedatamonitor.com

costs coefficient is significant. Otherwise, their urbanization rate improves the duration of trade. That part of the world is an example in terms of structural change and how growth in urban population has contributed to their economic development. All other things equal, improving the urban rate of these countries increase the duration of trade toward that region. That shows an interesting pattern for policymakers, mainly because it helps direct policies that would encourage trade toward these specific countries.

Furthermore, we provide estimation results when we add variables such as initial values of trade and lag of duration as explanatory variables. The specification here is very similar to that in column 1. Almost all coefficients follow the same pattern as before, but the lag of duration does not participate in trade duration even though it has a significant coefficient. However, as shown by Fugazza & Molina (2016) initial values is a good precursor of trade duration. Both sellers and buyers put trust in the trade relationship, and it is very difficult for such trade to die along the way. Instead of focusing on the number of products involved in each trade relationship, we focus on the initial values so that firms and stakeholders involved in international trade get first glance at the evolution of different spells. Lag of duration has negative effects on duration of trade meaning that trade is more sensitive to events and markets characteristics than past relationships among partners. It is important to consider that aspect because having a good trade relationship in the past does not guarantee future collaboration when shocks appear.

Table 2: Results from different specifications

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Distance	0.24***	-0.55***	0.30***	0.11***	-0.19*	0.30***
	(0.012)	(0.081)	(0.011)	(0.035)	(0.112)	(0.055)
Com_lang	-0.17***	-0.28***	-0.09***	-0.15***	-0.33***	-0.19***
	(0.009)	(0.019)	(0.011)	(0.035)	(0.025)	(0.036)
GDP	-0.21***	0.02***	0.07***	0.12***	0.01	-0.00
	(0.015)	(0.006)	(0.005)	(0.017)	(0.011)	(0.066)
Fin_Dev	0.04***	-0.00	-0.00***	0.00	-0.00	-0.06***
	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.009)
Ex_Rate	-0.01***	0.01***	-0.01***	-0.04***	0.01	0.14***
	(0.000)	(0.005)	(0.003)	(0.013)	(0.007)	(0.029)
Cost_Imp	-	0.03	0.07***	-	0.01	0.04
		(0.025)	(0.010)		(0.048)	(0.033)
Cost_Exp	-	0.05***	0.12***	-	0.10***	-0.17***
		(0.013)	(0.011)		(0.017)	(0.042)
Urban	-	-0.37***	-0.07***	-0.53***	-1.29***	-0.17***
		(0.093)	(0.012)	(0.040)	(0.153)	(0.042)
Lag_duration	-	-	0.03***	0.05***	0.04***	-0.01
			(0.005)	(0.016)	(0.009)	(0.015)
Initial	-	-	-0.15***	-0.25***	-0.15***	0.08***
			(0.002)	(0.007)	(0.004)	(0.006)
Spell_2	-	-	-	0.79***	-	-
				(0.160)		

Constant	0.35**	8.64***	-1.43***	2.67***	2.30***	1.65***
	(0.155)	(1.031)	(0.206)	(0.551)	(1.577)	(0.206)
Observations	522,658	183,290	335,403	37,075	103,130	59,369
Number of pcid	30,487	9,088	18,416	4,858	4,597	6,029

*Standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.10*

In sections above, we describe three different steps according to which integration economic agreements magnify themselves. These are the situation before the agreement, the situation during the agreement until it enters into force and the situation after the agreement is operational. The table above shows results from specification when the situation before two agreements (AGOA and ACP-EU) is considered. Columns 4 and 5 represent results before AGOA and before ACP-EU, respectively. Before AGOA agreement there were specific links between the USA and some West Africa countries, but these relationships were not extensive as they are under the AGOA. Distance and the GDP have a negative influence on duration of trade. Moreover, Spell 2, which represents all spells that stop and start afresh over the time span, has a negative influence on duration. That means that having a first experience of the American markets does not guarantee future success when firms manage to reestablish a trade links with firms in that market.

However, the initial volumes of goods traded are important for the future of each trade relationship in that market. Another result is the positive contribution of the USA urbanization rate on duration of exports from West Africa. The type of goods exchanged play a key role in these links, although there is not a clear theoretical explanation on how urbanization could trigger the initiation of a specific trade agreement. The dollar is still the international currency, especially for international transactions; therefore, it is normal to conclude that the exchange rate plays a positive impact on survival of trade relationships. The former result is sustainable even though most of African countries have experienced different episodes of currency depreciations and a devaluation for French speaking countries.

As far as the ACP-EU agreement concerns, distance and Europe's urban development contribute to spell duration. Both costs of exports and imports have a negative impact, though they are significant. These later findings show that before the agreement, the other agreements in place have not benefited from the scheme of exports and imports' costs existing in these different countries. The discussion about the ex-ante situation provides a clear pattern on how these agreements have been carried out and how other agreements that look alike are going to perform over time. The objective of this section is not to fully assess the different agreements but to provide insights on how future agreements the region is engaged in should be designed to favor trade intensity as well as the duration of trade relationships. The results also show that initial volume accounts for trade duration as predicted by the literature. The exchange rate coefficient is not significant.

The last column from the table above displays results from trade for which values are greater than one hundred thousand dollars. They do represent a considerable amount of trade relationships over our study time span and can be analyzed. From that specification variables such as distance, exchange rate, and cost of imports have negative influence on spell duration. The initial volumes of trade also show a negative and significant impact. That is, for higher volume the initial value is not the main determinant of any trade relationship life. The regulatory framework sometimes that follows such trade sectors are designed in a certain way to avoid multiple entry and exit, for they are vital for countries and regions.

However, GDP, financial development, and the urbanization rate are important for such relationships. In the same vein the lag of duration, sometimes associated with experience, has a positive influence. The new agreements designing in West Africa as well as in other African economic communities should consider experience of top exporters, which in turn could help newcomers in these markets to increase values and volumes. Being cautious about the disaggregation of our data, this study invites policymakers to target policies that increase volumes of trade such as trade fairs and promotion, but also policies that maintain many trade relationships alive.

Table 3: Determinants of export survival

VARIABLES	(1) y	(2) y	(3) y	(4) y	(5) y
DIST	0.35***	0.35***	0.29***	0.29***	0.36***
	(0.014)	(0.013)	(0.011)	(0.011)	(0.013)
COM-LANG	-0.05***	-0.07***	-0.09***	-0.09***	-0.07***
	(0.013)	(0.012)	(0.011)	(0.011)	(0.012)
GDP	0.07***	0.06***	0.08***	0.08***	0.10***
	(0.008)	(0.007)	(0.005)	(0.005)	(0.007)
DEV-FIN	-0.01***	-0.01***	-0.02***	-0.01***	-0.02***
	(0.0012)	(0.009)	(0.015)	(0.010)	(0.010)
EX-RATE	0.02***	-0.01	0.002	0.01	0.02***
	(0.005)	(0.004)	(0.003)	(0.003)	(0.004)
INTIAL	-0.14***	-0.15***	-0.14***	-0.15***	-0.16***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
LAG-DURATION	0.01	0.02***	0.03***	0.03***	0.02***
	(0.006)	(0.006)	(0.005)	(0.005)	(0.006)
AGOA	-0.15*	-	-	-	-
	(0.091)				
ACP_UE	-	-1.05***	-	-	-
		(0.178)			
UMA	-	-	1.21***	-	-
			(0.182)		
CEMAC	-	-	-0.17**	-	-
			(0.087)		
SADC	-	-	-	-1.21***	-

				(0.182)	
IGAD	-	-	-	-0.96***	-
				(0.176)	
ECCAS	-	-	-	-1.48***	-
				(0.177)	
ECOWAS95	-	-	-		-0.02
					(0.185)
Constant	-1.69***	-7.25***	-2.65***	-1.44***	-1.99***
	(0.226)	(0.385)	(0.159)	(0.185)	(0.260)
Observations	230,587	281,576	335,403	335,403	264,628
Number of pcid	16,973	17,648	18,416	18,416	17,428
Log-likelihood	-139835.58	-169902.47	-181906.21	-205130.71	-196235.31

*Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.10. UMA Union Maghreb Arabe; CEMAC Communauté Economique Et Monétaire De L'Afrique Centrale; SADC Southern Africa Development Community; IGADD Intergovernmental Authority on Drought and Development; ECCAS Economic Community of Central African States.*

5.2.1 Integration Economic Agreements

Based on the theoretical background, the effects of different EIAs are assessed. Contrary to the findings above, this section analyses the EIAs influence when these are in force and implemented. Columns 1 and 2 describe results when AGOA and EU-ACP agreements are considered, respectively. In these specifications, initial values of bilateral trade and lag of duration are added to common determinants of export survival. In column 1, the data is trimmed since the agreement officially started in 2000. AGOA has a positive and significant influence on the hazard rate.

It is important to note at this point that trade relationships under AGOA die faster and few of them exist overtime. However, there are many entries and exit in that market as demonstrated by Besedeš et al. (2006). For these relationships that survive over time, they are reinforced by factors mentioned above. That is, on average, firms located in West African countries trading under AGOA, which survive longer have sustainable relationship with the American market over time. Trading under AGOA significantly improves exports from African countries, as for example in COMESA (Socrates et al. 2020). Even though that result is significant at 10 percent it can help policy makers to design policy and reinforce firms' ability to take advantage of such agreement. A policy strategy can involve a national AGOA strategy to help participants to be aware and to fully take advantage of such framework. In addition, variables such as initial values, financial development, and common language have a positive effect on the hazard rate. Speaking English is key in the international market and trading with the USA makes it more important for firms.

Furthermore, when specification with the EU-ACP agreement is considered, the lag of duration does not contribute to export survival, even though it has significant coefficient. However, trading

under such agreement has a positive and significant effect for ECOWAS countries. Some arguments against the contribution of the agreement on export growth for African countries grow as the EU modifies its strategy by signing intermittent agreements with individual countries. Nevertheless, exports to European markets as well as developing countries under the agreement tend to survive overtime. Moreover, initial values of trade play an important role in the hazard rate. For policy makers it would be tempting, from these results, to design specific policy according to each agreement to reinforce their effect but it will be efficient to provide a coordinated policy framework where these determinants play a huge role. Exports toward developed countries under these agreements tend to be of benefit to firms in the South but it should be insightful to also assess the duration of trade in a South-South set up by analyzing exports to different regional economic communities based in Africa.

5.2.2 Regional Economic Agreements

What is the role of regional economic communities in the survival of exports from West Africa? It is worth noting that being in a regional community has the advantage of bringing a consolidated trade policy, at least for tariffs. In table 2, different regional communities are used as determinants of exports survival rate. Column 3 for example records results when UMA and CEMAC are considered. The former has a non-significant coefficient while the latter has a positive and significant coefficient. That is, trading with countries within CEMAC has on average a positive effect on the hazard rate. Practically, depending on the industry a trade relationship is made, when that route involves a country from West Africa and another from Central Africa the relationship tends to live longer. This result is also valid for countries under SADC, IGAD, and ECCAS (column 4). For example, SADC, a group of 15 member states with the objective of achieving development, growth, and poverty alleviation for its population. In addition, trade in goods has increased significantly for countries within the agreement. However, the results show that on average countries from ECOWAS have solid trade relationships with countries in SADC. That is evidence that intra African trade, even with little volumes, survive longer over time when they are established.

ECOWAS member states trade more with partners outside the continent. When the specification involves trade data from 1995 within the community, the result displays a positive but non-significant coefficient. That means trade within the region is important, even though a lot of that trade is not captured in official data. Another explanation of such results could be due to the aggregation level of the dataset used for this study.

5.2.3 Robustness checks

Analyzing trade could be responsive to the data used and the level of disaggregation. In this section, we use 8-digit origin-destination-product HS data for ECOWAS countries. A glance of the data shows that on average 25 percent of spells survive the second year[10]. We replicate most of the specifications above and chose to assess export duration in specific sector. The last method is useful to understand how firms at the sectoral level could strategize and envision trade partnerships with other firms in different countries, especially within the continent.

Table 4: Results using 8-digit data

VARIABLES	(1) y	(2) y	(3) y	(4) y	(5) Y
EX-RATE	-0.32**	-0.14***	-0.10***	-0.14***	-0.15***
	(0.163)	(0.010)	(0.009)	(0.010)	(0.035)
DIST	-0.001	0.01***	0.01***	0.01***	-0.01
	(0.05)	(0.025)	(0.058)	(0.064)	(0.001)
DEV-FIN	0.21**	0.16***	0.07**	0.14***	0.32***
	(0.104)	(0.034)	(0.031)	(0.034)	(0.080)
FDI	0.05	0.01***	0.01***	0.01***	0.04***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.012)
TARIFF	0.01	0.05***	-	0.05***	0.19***
	(0.024)	(0.007)		(0.007)	(0.030)
IMP	-0.02***	0.02***	0.02***	0.02***	0.01**
	(0.006)	(0.003)	(0.003)	(0.003)	(0.006)
EXP	0.02**	-0.02***	-0.01***	-0.05***	0.03***
	(0.006)	(0.002)	(0.002)	(0.026)	(0.008)
INFL	0.01***	-0.01***	-0.01***	-0.01***	-0.05***
	(0.002)	(0.004)	(0.008)	(0.001)	(0.001)
GDP	-0.05***	-0.02***	-0.01***	-0.01***	0.05***
	(0.054)	(0.069)	(0.001)	(0.08)	(0.056)
INITIAL	-0.02*	-0.07***	-0.07***	-0.07***	0.05***
	(0.009)	(0.005)	(0.005)	(0.005)	(0.018)
LAG-DURATION	-0.46***	-0.44***	-0.45***	-0.44***	-0.53***
	(0.031)	(0.028)	(0.028)	(0.028)	(0.068)
TOT-VAL	-0.14***	-	-	-	-0.11***
	(0.008)				(0.016)
AGOA		-0.17**			
		(0.088)			
ACP_UE			0.05		
			(0.044)		
AGOA-NO				-0.15**	
				(0.067)	
Constant	2.36**	1.20***	1.67***	1.28***	3.01***
	(1.189)	(0.182)	(0.162)	(0.182)	(0.685)
Log-likelihood	-21219.01	-24893.21	-26089.17	-24900.66	-4170.84

[10] Figure 2A in the appendix presents the Kaplan-Meier estimate graph and the hazard rate distribution.

Number of pcid	21,555	23,516	24,492	23,516	4,245

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.10

Column (1) shows general results while columns (2) and (3) present results with AGOA and ACP-EU agreements variables included. The findings show that even at this level of disaggregation variables such as lag of duration, GDP, initial value, or exchange rate do influence positively the duration of trade in West Africa. Exports and imports have been included to assess their impact on the probability of continuing trading with a particular trade route. Generally, imports improve the survival rate while exports influence negatively it. When the average volume of trade by partner is at the commodity level in consideration, exports tend to survive longer. This means that the volume exchanged between two partners is important but there are factors that count. Especially when we consider specific agreements like AGOA, the relationships have the tendency to survive better than non-AGOA products. This result is also confirmed in column 4, whereby a variable capturing the same products toward different destinations has been included. That variable denoted AGOA-NO serves as counterfactual and shows that exports in these sectors tend to survive longer than other products. However, as we say in the descriptive statistics, more efforts need to be made, especially in the investment packages included in the relationship between ECOWAS and the USA.

Furthermore, the duration of exports to other countries in Africa is influenced positively by variables such as the exchange rates and lag of duration. The latter could mean that once a trade route is created within the continent it tends to live longer. This finding is important for policy makers in the era of the implementation of the AfCFTA, where countries are developing strategies to reap the benefit of such agreement.

6.0 Concluding remarks

Export duration remains a vibrant research topic for it explains the sustainability of reforms undertaken in trade policy. Particularly, this study sought to understand the implication of different economic integration agreements on trade duration in West Africa. Therefore, it applies discrete time models over continuous time ones[11]. It is important to know the effects of the existing argument as Africa is already under a new continental trade agreement that is projected to make the continent fully connected and allow poverty reduction through trade. One of the main points in the literature has been the design of existing agreement and how they contribute both to the extensive and the intensive margins in trade. One component that drives results from trade agreement signed by West African countries has been the rules of origin. This study shows that despite these rules, trade duration is shorter. Although there is consensus that trade partnerships

[11] While continuous models treat time as a continuous variable, meaning that the export relationship can end at any precise moment, the discreate models treat time as a series of distinct intervals (months, quarters, years). The later estimate the probability that an export relationship, having survived up to a certain period, will fail in the next period.

within the continent do not last for long for many of these countries, most of their trading partners are based in Europe and America. The recent years have witnessed the rise of China in African countries trade statistics.

This paper also used discrete time models over continuous time models. The main reason relies on the fact that these models control better heterogeneity issues. We derived the hazard function then used the logit model on our database. The findings show that being in an agreement do reduce the death rate of trade relationships from West Africa. The study also found that the gross domestic products of trading partners do improve the survival rate of trade. These are key ingredients for policy makers for they help targeting key variables that influence trade duration. In the early implementation of the African Continental Free Trade Area, it is important for policy makers to assess the determinant of any trade relationships involving their countries. That could serve as a basis for reforms influencing key factors that would enable trade relationships to last longer. The exchange rate, for example, does have mixed impact on the survival, so it calls upon regional actions to reduce the need for foreign exchange by trading more within Africa and developing more regional value chains.

The raison d'etre for the Pan-African Payment and Settlement System (PAPSS) that was recently launched by Afreximbank in support of the African Continental Free Trade Area is to address the margins in intra-African trade that hard currencies, especially the dollar, impose on trade relations. For countries to benefit fully from integration agreements, they need to have specific strategies and not neglect the non-tariff part of the trade policy. Sanitary and Phytosanitary measures are important components of trade policy because they assure safety and security on international trade[12]. In addition, technical barrier to trade should also be considered to avoid witnessing market access withdrawal, and in turn death of important trade spells.

[12] https://cdn.odi.org/media/documents/8804.pdf

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Appendix

Table A1

2-digit HS Product Code	2007	2008	2009	2010	2011	2012
12 Oil seeds	39.333+	34	43.75	45.25	60.667	73
	25++	14	19.333	26.75	31.333	39.333
	74481.15+++	53631.28	52083.05	64985.8	49017.94	44058.48
18 Cocoa and Cocoa P.	4.333	4.667	26.667	26.667	29.333	48.5
	1.667	4	.5	8	10	14
	65280.89	36542.41	2019453	2992796	3051239	1999976
30 pharmaceutical products	10.333	7.667	21.333	17	17	18.667
	6.667	6.5	12	11.333	13.333	15.333
	2631.38	1743.145	1887.486	1186.831	1095.17	1294.286
31 fertilizers	11	4.5	7	8.5	12	13
	8.5	6	5	5.75	7	8.667
	119640.2	242708.2	89028.9	64423.95	216907.5	81487.69
63 Other made up textile	35.667	23	36.75	31	31.333	39.667
	21	20	24.333	19	19	24.667
	15217.07	4735.599	5167.335	4932.259	9450.573	2785.128
72 Iron and steel	44.333	37.25	34.5	34.25	39.667	44
	21.333	29	10	18	14.667	21.333
	30157.04	43677.82	62863.94	39044.06	60367.47	33896.36
85 Electrical machineries	72.333	56.75	78	82.5	93.667	104.667
	48.333	52	27.333	50.5	54	65.667
	7876.912	5897.644	4942.219	6076.261	5039.253	5774.065

Source: Exports Dynamics Database, World Bank, 2019. + is number of exporters, ++ is number of new entrants, and +++ represents average export value.

Table A2: Description of variables

Variables	Description	Sources
DIST	Distance: measured as the length between two capitals	CEPII (centre d'études prospectives et d'information internationales)
Com_lang	Common Language: taking the value 1 is two trading partners share the same official language.	CEPII (centre d'études prospectives et d'information internationales)
GDP	Gross Domestic Product: measured in real term base 2005.	WDI (world development indicators)
Fin_Dev	Financial Development: measured as credit accorded by banks to the private sector	WDI (world development indicators)
Ex_Rate	Exchange rate: official exchange rate	WDI (world development indicators)
Cost_Imp	Cost of import: measured in dollar US	WDI (world development indicators)
Cost_Exp	Cost of export: measured in Dollar US	WDI (world development indicators)
Urban	Urbanization rate: measured as the proportion of the population living in urban areas.	WDI (world development indicators)
Lag_duration	Lag of duration: described as a lagged value of the time a trade relationship exist.	Author
Initial	Initial values: described as the value involved the first time a trade is made between two countries.	WITS (world integrated trade solution)
Spell_2	A dummy variable that takes value 1 if an existing trade relationship dies and starts again after at least one year of stopping.	Author

Source: the author

Figure 1A: Kaplan-Meier Estimates and Smoothed hazard rate graphs with 8-digit data