Intra-regional trade facilitation: A comparative analysis between ECCAS and ECOWAS

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Abstract. Since the advent of the Abuja Treaty, Economic Community of Central African States (ECCAS) recorded poor intra-regional trade performance while Economic Community of West African States (ECWAS) performed better. The objective of this paper is to comparatively analyse the impact of trade facilitation measures on intra-regional trade between those two Communities, focusing on the role of Information and Communication Technology and custom environment indicators. Using data from United Nations Conference on Trade and Development, Geodist of Centre d'Etudes Prospectives et d'Informations Internationales and World Bank, our augmented gravity model results showed that internet has a positive and significant impact on the intra-ECCAS trade and no impact on intra-ECOWAS trade. Mobile phone has a positive and significant impact on the intra-regional trade in both zones. The number of days for export has a negative and significant impact on intra-regional trade in both zones, while the result of the number of document is ambiguous. The impact of the increase in these two indicators reduced trade more in ECCAS than in ECOWAS.
Keywords. Trade facilitation, ICT, ECCAS, ECOWAS, Augmented gravity model.
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1. Introduction

I n most developed and emerging countries, economic growth and economy stability are due to the high level of international and intra-regional trade motivated by good economic infrastructure. As trade is an important driver of growth, infrastructure is a necessity for trade. Transport network, Information and communication technology (ICT) and energy are the major obstacle to most developing countries' trade. Poor infrastructure and institutions contribute to high trade cost along in sub Saharan countries. High trade cost has a negative impact on a country economic performance in several ways (Portugal-Perez *et al*, 2010).

Indeed, Africa is still the place where importers and exporters face far greater hurdles than anywhere else. According to Seck (2017), it takes on average more time to ship a container from Africa to the rest of the world (31 days) or from the outside world to Africa (38 days) than any other region in

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the world. In addition, over the course of trading across African borders, it is required a far greater number of documents: 8 when exporting and 9 when importing. As a consequence, the average cost of flowing goods across borders is larger in Africa: US$2,108 to ship a container outside the average African country, and US$2,793 to send a container in the opposite direction (respectively 2.5 and 3.2 times as much as it costs to trade in East Asia and the Pacific). All of these impediments spell higher trade costs in Africa and the resulting higher prices of traded goods tend to discourage both imports and exports, further harming African economies' international competitiveness (Arvis *et al.*, 2013). African manufacturers do not emerge because of restrictive trade and customs regulation as well as poor customs administration (Clarke, 2005).

African firms could greatly beneft from trade facilitation, and the aggregate benefits could translate into an improvement in the continent's international trade position. To the extent that trade facilitation reforms are able to reduce trade costs, they have the potential to generate significant gains through greater trade participation and trade volumes of firms, as well as an increase in national income (Seck, 2016). In fact, it has been estimated that a reduction in trade transaction costs by just 1% as a result of trade facilitation would generate welfare gains that amount to US$ 40 billion, of which two-thirds accrue to developing countries (OECD, 2009). Earlier, WTO (2004) showed that a mile on the Douala-Ndjamena road is three times more expensive than the Maputo-Johannesburg road and ECA (2008) argued that transport costs are high in Africa in general and particularly in landlocked countries, they reach an average of 14% of the exported value against 8.6% for the developed countries.

In fact, infrastructure are identified as an important input of growth[1] (Hansen, 1965; Gramlich, 1994) and of trade facilitation (Bhattacharyay, 2009). The WTO defines trade facilitation as "the simplification and harmonization of international trade procedures". Trade facilitation involves all measures taken by countries to promote cross-border trade, these are agreements to simplify customs procedures by reducing costs and improving their speed and efficiency.

In recent years, the issue of trade development in Africa has been brought back to the force with the establishment of the African Continental Free Trade Area in Rwanda in march 2018. Indeed, the development of intra-African trade which remains low is in the heart of the African Union's Agenda 2063 and progress is being made in some RECs such as the South African Development Community (SADC), the African Community of East (EAC) and the Economic Community of West African States (ECOWAS), but the Economic Community of Central African States (ECCAS) remains the least integrated of all. ECCAS and ECOWAS francophone dominance, have many similarities. Among the fifteen ECOWAS countries, the eight members of the

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[1] The pitiful status of infrastructure in Sub-Saharan Africa hampers economic growth of in about two percent every year and reduces up to 40% productivity firms (World Bank, 2009).

West African Economic and Monetary Union (WAEMU) are members of the Franc Zone with a common currency, as are the six countries of the Economic Community and Monetary Central Africa (CEMAC) members of ECCAS. It should also be noted that Cote d'Ivoire leader in WAEMU zone is the only country to have signed an interim Economic Partnership Agreement (EPA), like Cameroon leader in CEMAC zone.

The speed of implementation of the Abuja treaty steps is different in both RECs as the evolution of intra-regional trade. It is clear that ECOWAS[2] record a positive change in their intra-regional trade, while that of ECCAS which is also the least integrated REC in Africa remains less than 3% since 1995 (UNCTAD, 2017). We can also see that many ECCAS countries have ECOWAS as their main destination for exports in 2017, while their exports to ECCAS do not reach 30%. Indeed, exports from Cameroon, Congo, Central African Republic (CAR), Burundi, Chad, Rwanda and Gabon to ECOWAS are respectively 62%, 58%, 52%, 45%, 39%, 35% and 34% in 2017[3].

This paper improves the understanding of the essence of low level of intra-ECCAS trade, with the aim of making a comparative analysis of trade facilitation on intra-regional trade between ECOWAS and ECCAS. Some other studies revolved around infrastructure such as road transport as a factor in trade integration (Portugal-Perez, 2010; Bhattacharyay, 2009; Limao & Venables, 2001), our study is focusing simultaneously on ICT and custom and regulatory environment indicators.

The rest of the paper is organized as follows: section 2 presents the literature review, Section 3 presents the current situation of trade facilitation and trade evolution in the two RECs, section 4 will be methodology and results, and Section 5 will be the conclusion.

2. Literature review

Several factors have been identified as trade facilitation factors between countries of the same region or even different regions. The results of the studies done in this area indicate that the expected expansions in trade due to improvements in trade facilitation are quite significant. Limao & Venables (2001), mentioned that one of the first obstacles to trade between sub-Saharan Africa countries is the geographical barriers. According to Freund & Weinhold (2002), a 10 percent increase in relative number of Web hosts in one country would have increased trade flows by one percent in 1998 and 1999. Flink *et al.*, (2002) find that 10 percent decrease in communication costs is associated with an 8 percent increase in bilateral trade.

Wilson *et al.*, (2005), estimated the relationship between trade facilitation and trade flows in manufactured goods in 2000-2001 in global trade,

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[2] Despite many challenges and regional realities, integration has progressed due to some conditions such as the customs union, free movement of persons and goods, ECOWAS' passport etc, nevertheless, regional integration strategies in both RECs are based on certain key factors, including macroeconomics, transportation corridors, ports, energy, ICT, trade, and private sector development.

[3] Computed by the authors using [Retrieved from].

considering four important categories: port efficiency, customs environment, regulatory environment, and service sector infrastructure. They have concluded that gains from own reforms are much larger in South Asia. When consider port efficiency South Asia gains more as an exporter with their own improvements. Djankov *et al.,* (2006), show that each additional day that a product is delayed prior to being shipped reduces trade by at least one percent and delays have an even greater impact on developing country imports and exports of time sensitive goods, such as perishable agricultural products. According to UNCTAD (2001), a one percent reduction in the cost of maritime and air transport could increase Asian GDP by $3.3 billion and a one percent improvement in productivity in wholesale and retail services could increase GDP an additional $3.6 billion. Dennis & Shepherd (2007) use the number of 8-digit product lines for every two-digit sector exported from developing countries to the EU in 2005 as a measure of export diversification this being seen as export growth at the extensive margin. They find that export costs, have a significantly negative effect on the number of product lines exported in every 2-digit sector. Sadikov (2007) makes use of the Doing Business Database to measure trade facilitation-related border barriers as the number of signatures that an exporter has to collect from the authorities to export a good an concluded that export volumes of differentiated products are more sensitive to changes in export signatures than exports volumes of homogeneous goods. Martínez-Zarzoso & Márquez-Ramos (2008), study the effect of trade facilitation on sectoral non-zero trade volumes in 2000. Including variables from the Doing Business Database, which measure the costs and time involved in exporting and importing, they conclude that export volumes of homogeneous and reference-priced goods are less time-sensitive than export volumes of differentiated goods.

Bhattacharyay (2009), examines the role and need of transport, energy and ICT on ASEAN integration. He concludes that infrastructure is crucial in supporting and enhancing intra-ASEAN trade on the one hand, and secondly trade with other partners. Mattes *et al.,* (2009), verify the theoretical argument that ICT promote trade between countries when they have very advanced and similar levels of technology**,** by focusing on the European Union. The results showed that the development of ICT has a positive and significant impact on EU trade; in fact, two countries with an ICT network are trading 33% more than two countries do not have the same level of ICT development.

Portugal-Perez & Wilson (2010), from an aggregate index of infrastructure analyze the impact of infrastructure on export performance of 101 developing countries over the period 2004-2007 and found that trade reforms increased export performance, particularly infrastructural investment and these reforms aimed at improving the business environment. For example, improving the quality of infrastructure in Egypt almost to the level of Tunisia, that is increase exports by 10.8 percent.

Musila (2005), focusing on COMESA, ECCAS and ECOWAS, found that, the intensity of trade creation is stronger in ECOWAS countries followed by those of COMESA. Coulibaly & Fontagné (2005) estimated that the intra-

WAEMU trade could be triple if all road linking member countries were tarred. Agbodji (2007), assessing the impact of fraud in cross-border trade within WAEMU, constructed an index of infrastructure with two indicators and three variables (transport and communication, specifying the number of kilometers of roads, rail, and the number of telephone line). Using a dynamic gravity model, he shows that the premium on the parallel market and the tax burden has encourage bilateral trade fraud; notwithstanding the infrastructure has a positive impact on trade within WAEMU. Njinkeu *et al.*, (2008), pointing out that infrastructure services are the major factors that stimulate intra-African trade. Foster & Briceño-Garmendia (2009) argued that the conditions of roads in sub-Saharan Africa are relatively good; the speed of movement of the cargo does not exceed an average of 10 km / hour mainly because of the difficulties to cross borders and crossing ports. They added that the transport of a container at the Douala port in Cameroon, to Bangui in CAR or N'Djamena in Chad takes on average two to five weeks[4].

More recently, Seck (2017), noted that it takes on average more time to ship a container from Africa to the rest of the world (31 days) or from the outside world to Africa (38 days) than any other region in the world. In addition, it is required a far greater number of documents: 8 when exporting and 9 when importing. As a consequence, the average cost of flowing goods across borders is larger in Africa: US$2,108 to ship a container outside the average African country, and US$2,793 to send a container in the opposite direction (respectively 2.5 and 3.2 times as much as it costs to trade in East Asia and the Pacific. It emerges from this review that although many studies have included African countries, few studies have been conducted specifically for African RECs, in order to strengthen Continental Free Trade Area (CFTA) breathing in Africa. This research seeks to help bridge this gap by doing a comparative analyzing of trade facilitation measures in between ECOWAS and ECCAS.

3. Status of trade facilitation indicators and intra-zone trade in ECOWAS and ECCAS

Trade facilitation are defined in a narrow sense as the transportation logistics and custom administration associated with cross border trade and has been broadened to include environment where the trade transactions take place. This includes the transparency of trade policy and regulation as well as product standards, infrastructure and technology as it applies to lowering trade costs (World Bank, 2009). Four aspects are commonly addressed under trade facilitation, port efficiency, custom environment, regulatory environment and service sector infrastructure. Port efficiency measures the quality of infrastructure of maritime and airports. Custom environment measures the direct custom costs and administrative transparency of customs

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[4] However, note that this length of time has reduced in recent years between Cameroon and CAR, with the tarring of the Central Africa portion from the border with Cameroon (Garoua - Boulaï) to Bouar CAR.

and border crossings. Regulatory environment deals with the institutional issues and regulations. The service sector infrastructure represents the extent to which an economy has the infrastructure on telecommunications, financial intermediaries and logistic firms (Eliason, 2015; Weerahewa, 2009; Wilson *et al.*, 2005). Doing Business data provides a number of measures on trading across borders.

3.1. Custom and regulatory environment in ECCAS and ECOWAS

The Doing Business Database has been extensively used. Dennis & Shepherd (2007) used the costs of exporting, Sadikov (2007), used the number of signatures and Martínez-Zarzoso & Márquez-Ramos (2008) used costs and time of exporting and importing. In this paper we use indicators such as number of documents and days for exports and the cost involve in exports.

On average, both RECs experienced a reduction of exports cost, while exporting a container from ECCAS remain on average twice that of ECOWAS in 2015. Between 2006 and 2015, the best-performing country in ECOWAS include 76% in Ghana and 70% in Guinea, and in ECCAS being STP with a reduction of 72%, followed by the DRC (67%). Regarding the number of days to export, there is on average a reduction of 13% in ECCAS and 26% in ECOWAS between 2006 and 2015. It takes on average almost twice days to export for a country of ECCAS than a country in ECOWAS. The number of day to export is clearly increasing in Gabon (five days more) and also in Cote d'Ivoire (2 days more) and Guinea (2 days more) between 2006 and 2015. Between 2006 and 2015, ECOWAS experienced on average a reduction of 13% of the number of documents to export, while in ECCAS there is an average an increase of 13%. Apart from Rwanda, which has a 46% reduction the number of documents has remained constant or is increasing in ECCAS, unlike in ECOWAS where the overall trend is to reduce the number of documents to export like that of developed and emerging countries. Landlocked countries have time and cost to export higher than the rest of the country regardless of the region.

Table 1. *Export costs in some selected countries*

	2006			2015				2006			2015		
ECCAS	Costs	Days	Documents	Costs	Days	Documents	**ECOWAS**	Costs	Days	Documents	Costs	Days	Documents
Angola	4921	64	10	2060	40	10	Benin	965	34	8	1 030	25	5
Burundi	2287	47	9	2 905	32	9	Burkina Faso	2226	45	11	2 455	41	10
Cameroon	1032	27	9	1 379	23	11	CIV	1744	23	9	1 990	25	9
Congo	2201	50	11	3 795	50	11	Gambie	1676	23	6	1040	19	6
Gabon	1510	19	5	2 045	20	6	Ghana	3728	47	6	875	19	6
Equato Guinea	1403	29	7	1 390	29	7	Guinea	3061	34	7	915	36	7
CAR	4581	57	8	5 490	46	9	Guinea Bisau	1778	27	6	1 448	25	6
DRC	10303	46	7	3 365	44	7	Liberia	2271	20	10	1 320	15	10
Sao-Tome P.	2548	27	8	690	26	8	Mali	1752	44	7	2 440	26	6
Chad	4867	78	7	6 615	70	8	Niger	2743	59	8	4 475	56	8
Rwanda	3840	60	13	3245	26	7	Nigeria	3009	41	10	1 380	23	9
							Senegal	958	31	8	1 225	25	7
							Sierra Leone	2983	21	11	1 185	12	6
							Togo	463	34	8	940	23	6
Mean	3590.3	46	8	2998.1	40	9	Mean	2096.1	35	8	1622.7	26	7

Source: Authors computation using doing business data

Concerning the LPI countries are ranked from 1 to 5, with 1 for countries with low LPI and 5 for high LPI countries. ECOWAS countries are ranked better than those of ECCAS. CIV has the highest LPI (3.1), also has the best infrastructure (2.8) and customs (2.8); Rwanda is getting closer with a LPI of 2.99, infrastructure of 2.7 and customs (2.8). Note that Rwanda is experiencing a great progress since a LPI of 1.77 in 2008. The LPI average is higher in ECOWAS than that of ECCAS, it is the same trend for Customs and infrastructure indicators. However, efforts remain to be made in both RECs, since the highest ranked country in 2018 is Germany with a LPI of 4.2.
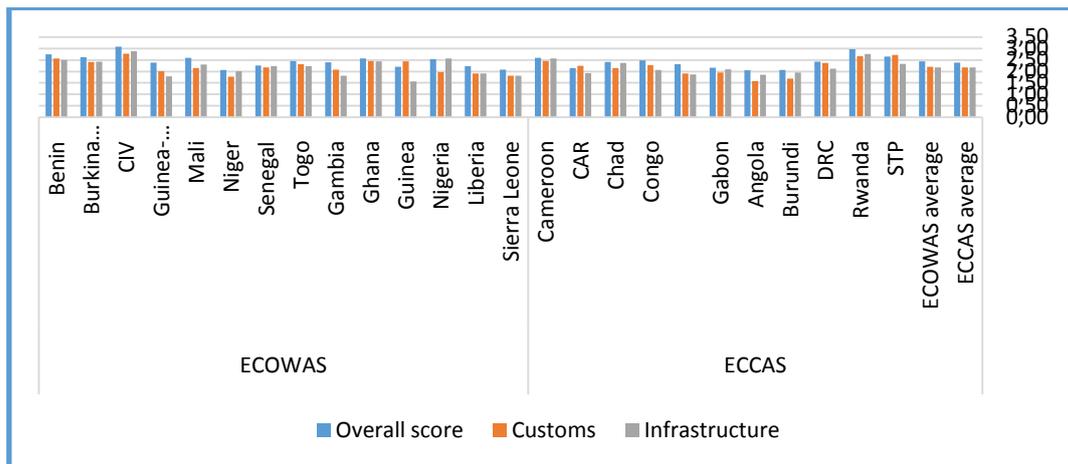
Graph 1. *Logistic performance index in ECCAS and ECOWAS (2018)*
Source: Authors computation using World Bank Logistic Performance data.

3.2. Economic infrastructure (ECCAS and ECOWAS)

Road transport remains the main mean to export in both RECs. Rail is just in a few countries, and its utilization remains marginal as well as shipping. The percentage of paved road is in average better in the ECOWAS than in the ECCAS. The fewest in ECOWAS is Liberia with 6% while the highest percentage is in Gambia 30%. However, except Sao Tome which has about 70% of paved road in the ECCAS, no other country in the region exceeds 10%, with CAR, DRC and Chad which do not have up to 5% of paved road. Note that the proportion in many emerging countries stand at 70% and even 100% in Singapore[5]. Energy is seen as the principal constraint faced most large enterprises in the world (World Bank, 2012). There is poor supply of electricity in most of the countries in both REC while demand is increasing. It should be noted that North Africa is experiencing a progress comparable to emerging countries, which is not the case for SSA countries except in South Africa where the situation is relatively good with more than 50% whatever the area (urban or rural) in 2016[6]. Access to electricity in urban area in all ECOWAS and ECCAS countries is lower than that of the world average (96%) except Gabon

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[5] These Paved road percentage data of the year 2000, are from the World Bank World Development Indicators 2018.

[6] Electricity access data are from the World Bank data base World Development Indicators 2018.

(98%). The situation is very worrying in CAR (15%), Chad (18%) and DRC (36%) concerning the urban population access to electricity.

Looking at ICT, efforts are notable in both RECs. We noticed a significant evolution regarding mobile phone subscribers but internet using remains a big deal in both RECs. However, this performance is not homogeneous in both RECs. There is an average 18 internet users per 100 inhabitants in ECCAS and 15% in ECOWAS. The most advanced country is Gabon (48 users), followed by Ghana (34 users) in 2018.
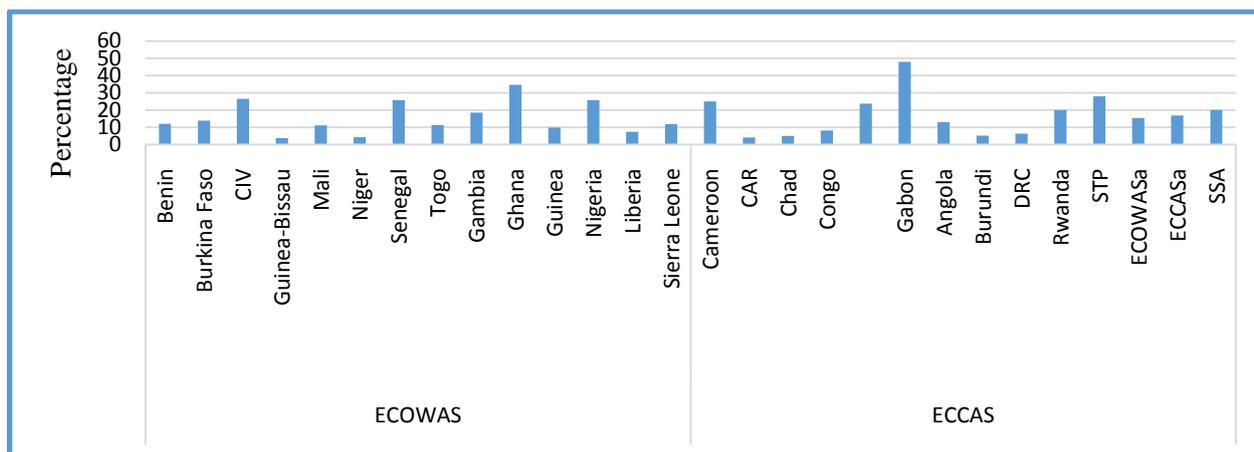
Graphic 2. *Individuals using the internet by REC (2016)*
Source: Authors computation using World Bank (WDI 2018).

Looking at this mobile phone using, efforts are seriously made in both RECs and countries like Gabon (180 per 100 inhabitants) and Congo (99 subscribers per 100 inhabitants) in the ECCAS, Ghana (101 subscribers per 100 inhabitants) and Mali (98 subscribers per 100 inhabitants) in ECOWAS recorded a huge breakthrough, similar in some emerging countries such as Singapore (153 subscribers per 100 inhabitants).
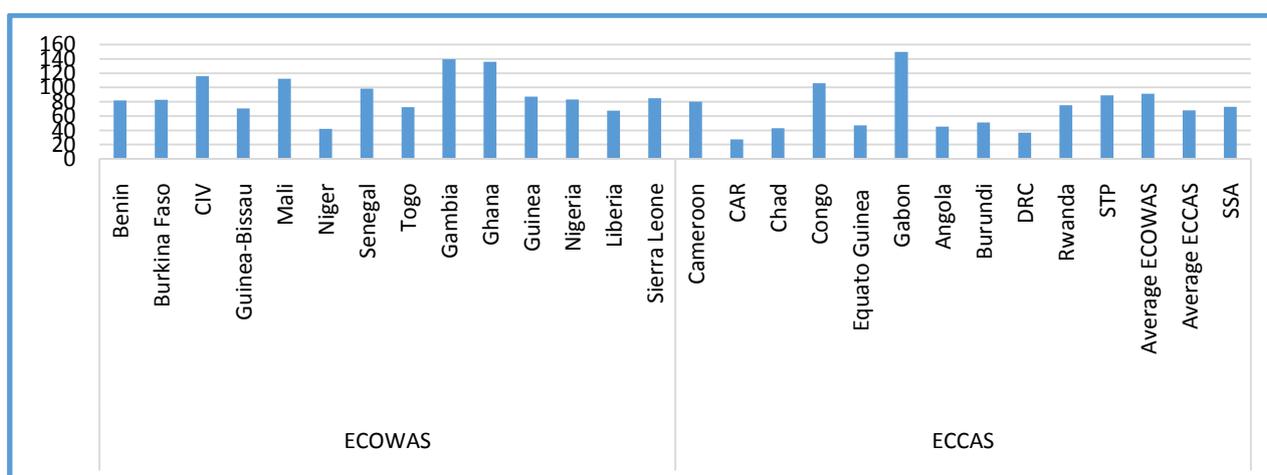
Graphic 3. *Mobile cellular subscriptions per 100 people by REC in 2016*
Source: Authors computation using World Bank (WDI 2018).

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3.3. Trade evolution in ECCAS and ECOWAS

Table 5 presents the contribution of each ECCAS and ECOWAS country in inter-zone trade in 2017. Basically, ECCAS countries export more somewhere else than in Central Africa because of their weak diversification which prevents economic complementarity. ECOWAS is the main destination of seven ECCAS countries exports in Africa, mainly because of their trade relations more developed with Nigeria, then comes the SADC because of the high trade level of Angola and DRC with South Africa. No ECCAS country has Central Africa as its main export zone in 2017. Between 1996 to 2017, exports of CEMAC countries to Nigeria have evolved from 2% to 13% for Congo, from 1% to 12% for Gabon and 70% to 79% for Cameroon (UNCTAD, 2018)[7]. Contrary to ECCAS, the main export partners of ECOWAS countries are in the West Africa their natural area.

Table 2. *Parts of inter-zone export in percentage in 2017 (ECCAS countries)*

ECCAS							ECOWAS						
RECs							RECs						
Countries	ECCAS	ECOWAS	EAC	SADC	AMU	Total	Countries	ECCAS	ECOWAS	EAC	SADC	AMU	Total
Angola	0,10	1,81	0,02	**97,84**	0,23	100	Benin	11,18	**86,20**	0,09	1,88	0,65	100
Burundi	0,43	**44,69**	11,43	42,42	1,03	100	Burkina	0,54	**80,93**	0,06	17,40	1,08	100
Cameroon	13,82	**62,04**	0,10	7,48	16,56	100	CIV	8,32	**76,17**	0,17	12,33	3,00	100
CAR	2,33	**51,90**	34,87	0,49	10,41	100	Gambia	0,23	**93,18**	0,15	1,58	4,86	100
Chad	26,15	**38,80**	3,36	3,03	28,67	100	Ghana	2,81	**75,64**	0,22	19,81	1,53	100
Congo	2,36	**58,27**	0,27	37,12	1,99	100	Guinea	1,07	**66,87**	0,03	27,40	4,63	100
DRC	1,84	1,07	1,07	**96,02**	0,00	100	Guinea Bi	4,26	**93,94**	0,00	0,00	1,79	100
E. Guinea	1,32	0,01	0,01	**98,65**	0,02	100	Liberia	0,06	**98,26**	0,06	1,10	0,52	100
Gabon	28,25	**34,29**	0,04	28,20	9,22	100	Mali	0,92	**78,03**	0,28	15,84	4,92	100
Rwanda	0,49	**35,45**	29,37	34,65	0,04	100	Niger	0,38	**95,20**	0,40	0,50	3,52	100
Sao Tome P	15,15	39,08	0,01	**43,90**	1,87	100	Nigeria	8,15	**53,54**	0,09	37,44	0,79	100
							Senegal	11,28	**83,94**	0,12	1,20	3,45	100
							Sierra Leone	0,62	**80,83**	0,31	16,62	1,63	100
							Togo	9,15	**79,88**	0,23	9,04	1,70	100

Source: Authors computation using UNCTAD data

4. Methodology and data

4.1. The model

For estimating the impact of the trade facilitation measures on intra-regional trade in ECCAS and ECOWAS, we use an augmented gravity model. The gravity model is one of the most popular and successful frameworks in economics. The pioneering work of Tinbergen (1962), gave rise to a vast theoretical and empirical literature on the gravity model related to trade. In its simplest form the gravity model on trade postulates that trade flows from country i to country j, is proportional to the product (GDP) of the two countries, and inversely proportional to their distance. In these variables, we generally include other factors that may influence trade (Tenreyro & Silva, 2005).

However, several versions of the gravity model have been developed (Anderson & Wincoop, 2004). The gravity model that we have retained is inspired from that of Sadikov (2007) and Martínez-Zarzoso & Márquez-Ramos

[7] Calculations of the authors using Online UNCTADStat.

(2008). Unlike these authors, our model is enriched with some economic variables that may increase intra-REC trade. The specification of the linearized model is as follow:

Model 1: ECCAS

$$L\exp_{ijt} = \alpha_i + \lambda_t + \alpha_1 Lgdp_{it} + \alpha_2 Lgdp_{jt} + \alpha_3 Lict_{it} + \alpha_4 Lict_{jt} + \alpha_5 Ldist_{ij} + \alpha_6 Lpop_{it} + \alpha_7 Lpop_{jt} +$$
$$+\alpha_8 Bor_{ij} + \alpha_9 Cur_{ij} + \alpha_{10} Col_{ij} + \alpha_{11} Lan_{jt} + \alpha_{12} LLoc_i + \alpha_{13} Lday_{it} + \alpha_{14} Lday_{jt} + \alpha_{15} Ldoc_{it} + \alpha_{16} Ldoc_{jt} +$$
$$+\alpha_{17} Censad_i + \alpha_{18} Cemac_i + \alpha_{19} Comesa_i + \alpha_{20} Sadc_i + \alpha_{21} Eac_i + \varepsilon_{ijt}$$

(1)

Model 2: ECOWAS

$$L\exp_{ijt} = \alpha_i + \lambda_t + \alpha_1 Lgdp_{it} + \alpha_2 Lgdp_{jt} + \alpha_3 Lict_{it} + \alpha_4 Lict_{jt} + \alpha_5 Ldist_{ij} + \alpha_6 Lpop_{it} + \alpha_7 Lpop_{jt} +$$
$$+\alpha_8 Bor_{ij} + \alpha_9 Cur_{ij} + \alpha_{10} Col_{ij} + \alpha_{11} Lan_{jt} + \alpha_{12} LLoc_i + \alpha_{13} Lday_{it} + \alpha_{14} Lday_{jt} + \alpha_{15} Ldoc_{it} + \alpha_{16} Ldoc_{jt} + \alpha_{17} Censad_i + \alpha_{18} Waemu_i + \varepsilon_{ijt}$$

(2)

EXP_{ijt} are the bilateral exports between the partners at time t. Indeed, in the empirical literature two variables are often considered as dependent, imports or exports (Freund & Weinhold, 2004); Agbodji, 2007; Sadikov, 2007). We use this last variable as dependent, since the aim of this study is to look for ways to increase the level of intra-ECCAS exports. $GDP_{i(j)}$ is the GDP of the two partners proxy of the market size at time t; $POP_{i(j)}$ population of the two partners at time t; $DIST_{ij}$: is the distance between the capitals of the two partners. There are five traditional dummy variables which take the value 1 when both partners have the same colonial masters (Colij), common language (Lanij), a common currency (Curij), or share the border (Borij) and 0 otherwise. Similarly, variable (LLoci) takes the value 1 when the exporting country is land locked, and 0 otherwise.

Some dummies variable characterizes regional trade agreement to which ECCAS and ECOWAS countries also belonging to. These variables take the value 1 when the exporting country belongs also to SADC, COMESA, EAC, and CENSAD and 0 otherwise. RTA dummies are commonly used in traditional models to assess the creation or trade diversion in the direction of Viner (1950). Trade creation results have a positive sign, while diversion of exports takes place when the propensity to export to the others REC increases while the overall tendency to trade with other members of the ECCAS or ECOWAS decreases. There are also trade facilitation variables. Doc(i,j) is the number of documents for export of the two partners at time t, day(i,j) is the number of days for export of the two partners at time t. ICT(i,j) of the two partners at time t; there are two variables, the number of internet users per 100 inhabitants and mobile phone subscribers per 100 inhabitants. ICT can increase efficiency and productivity, as well as reduce transaction costs.

α_i, is the specific effect that captures the effect of other geographical or cultural determinants not taken into account in the model, λ_t is the time effect,

ε_{it} ,is the error term. L: indicates that the variable in logarithm form, which permits the interpretation in terms of elasticities.

4.2. Estimation method

To overcome the correlation between specific effects and the explanatory variables, the easiest solution is to eliminate the specific effect by using the within estimator or any other estimator that eliminates the specific effect, for example the first difference estimator (Sevestre, 2002). However, these transformations do not allow to estimate the impact of an invariant time explanatory variable, including regional trade agreements. The Hausman-Taylor estimator to test the hypothesis of individual fixed effects exogeneity is then necessary (Hausman & Taylor, 1981; Serlenga & Shin, 2007; Brun *et al,* 2002). Another problem that arises when analyzing trade flows among developing countries is the presence of zero values in the dependent variable. A more efficient solution would be to use the Poisson pseudo maximum likelihood estimator (PPML) which allows the model to be automatically estimated with zero values (Santos Silva & Tenreyro, 2011b). In particular, they show that due to no-spherical disturbances and following Jensen's inequality, the log-linear specification leads to biased estimates, and they provide evidence that the PPML is more efficient than the non-linear least squares estimator. As a result, the PPML has been widely used to estimate gravity models (Gourieroux *et al,* 1984).

Data used come from many databases. GDP, population and ICT indicators come from the World Bank database World Development Indicators with positive expected signs (Anderson & van Wincoop, 2004; Sadikov, 2007; and Lin, 2014), those on bilateral exports from UNCTAD, those concerning, common colony, border, language, currency, distance landlocked countries come from Geodist data of Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) these two last variables are expected to have a negative impact on trade (Anderson & van Wincoop, 2004; Portugal-Perez and Wilson, 2010), and finally those concerning trade facilitation indicators come from the Doing Business World Bank database[8].

4.3. Results and discussion

Several estimators have been used to estimate our gravity model and the results are reported in the tables below.

Table 3 reports estimations for the ECCAS and Table 4 for the ECOWAS. For both scenarios, we compute estimations for the Fixed Effects estimator (FE), the Random Effects estimator (RE) and the Poisson Pseudo Maximum likelihood (PPML) estimator.

All three models well indicating that the economic variables behaved well. The three models have high joint F/Wald statistics indicating strong joint significance of the variables. Furthermore, the goodness of fit measured vary

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[8] Fourteen ECOWAS countries and Eleven ECCAS countries are included in our sample, Mauritania is excluded. The study is conducted over the period 2006 to 2015. See Annex.

from 0.49 to 0.97 with the RE model registering the highest R-square (Tables 9, 10). The Fischer test for fixed effects has a probability less than 5% showing that the individual fixed effects are significant. The Hausman test probability is less than 5% for all the estimations, showing that we should reject the null hypothesis that the random effects model is preferable, meaning that we should use the fixed effects model, the time fixed-effects are not needed.

Concerning estimates of trade facilitation measures, an analysis of Tables 9 indicates that the number of day of the exporting country relate negatively and significantly with intra-regional trade (Djankov *et al.*, 2006; Martínez-Zarzoso & Márquez-Ramos, 2008), but positively when we consider the PPML estimator (Table 3, Col.12), while that of the importing country is always positively correlated with intra-regional trade in ECCAS region. The number of document of the exporting and importing countries relate positively and significantly with intra-regional trade in ECCAS region, but this result is not in line with the economic theory. Tables 10 indicates that the number of day of the exporting and importing countries relate negatively and significantly with intra-regional trade in ECOWAS region. The number of document of the exporting country relate positively and significantly with intra-regional trade in ECOWAS region, not in line with the economic theory, but that of the importing country is negatively correlated with the intra-regional trade in ECOWAS region in all the estimates.

We can be seen that the impact of the increase in the number of documents and the number of days more reduces trade in ECCAS than ECOWAS. Indeed, a 1% increase in the number of days of the exporting country leads to a drop in exports between 0.6% to 1.2% in ECCAS (Table 3, Col.3 and Col.6) while just a decrease between 0.4% to 0.6% in ECOWAS (Table 4, Col.6 and Col.9). The increase in the number of days of the importing country leads to a drop in exports between 0.3% and 0.4% in ECOWAS, but the impact is positive in ECCAS. This positive, counterintuitive result can be justified by the high level of corruption in ECCAS, with countries ranked among the most corrupt in the world. This result is in line with that of Nkendah (2010, 2013), which states that there are significant informal trade flows between the CEMAC countries and that this is due to an institutional failure in the CEMAC. Indeed, despite the measures put in place in CEMAC countries in recent years to improve the business environment, these facilitation indicators do not drop. Indeed, the main products traded in the region being food, this is done by road, transporters who do not give bribes can end up doing more than days that those who are willing to bribe to pass quickly. Similarly, a 1% increase in the number of documents of the exporting country leads to a decline in exports between 0.5% and 1.01% in ECOWAS (Table 4, Col. 1 and Col.3).

We observe that the effect of ICT service measures on intra-regional trade in both REC (ECCAS and ECOWAS) is sensitive to the estimation technique. When considering internet, the relationship was negative and significant for exporting country in ECCAS for results from PPML (Table 3, Col. 3 and Col. 9). According to Salahuddin & Gow (2015), poor investment in ICT

infrastructures and low levels of competition in the internet and phone services market results to high prices that could explain their negative impact on trade. For the importing countries we find a positive and significant relationship in ECCAS for results from FE and PPML (Table 3, Col. 1, Col. 7 and Col. 9) and in the ECOWAS for results from PPML (Table 4, Col.3 and Col. 9). The last result is in line with those of Yutaka & Akio (2013) and Vemuri & Siddiqi (2009). Martínez-Zarzoso & Márquez-Ramos (2008) and Sadikov (2007). Looking at mobile phones, the level of the exporting and importing country related positively and significantly in ECCAS when considering all for estimator (Table 3, Col. 4, Col.10 and Col.12) and only related positively and significantly for the importing country in ECOWAS from results of FE (Table 4, Col. 4 and Col. 10). Indeed, low intra-regional trade remains explained by poor infrastructure in general leading to high trade costs (Agbodji, 2007; Longo & Sekkat, 2004).

Regarding on the impact of regional trade agreements, CENSAD is positively related to ECOWAS from results of PPML (Table 4, Col. 9 and Col. 12), but negatively related to ECCAS from results of PPML (Table 3, Col. 9 and Col. 12). That mean that belonging to the CENSAD is create trade in ECOWAS (Musila, 2005; Sekkat & Longo, 2004; Ogunkola, 1998; Elbadawi, 1997; Radelet, 1997; Pritchett, 1993). Contrary, belonging to CENSAD is trade diverting for the ECCAS. That can be justify by the fact that all ECOWAS countries are membership of CENSAD, while only Chad, CAR and Sao-Tome and Principe are CENSAD's member. Belonging to EAC (Burundi and Rwanda) and SADC (Angola and DRC) is also trade diverting in ECCAS. Our descriptive analysis showed that although Angola achieves more than 98% and DRC more than 96% of their exports to South Africa in particular because they are membership in SADC, Rwanda over 30% in the EAC in 2017.

An appraisal of the other traditional variables shows that they are in line with many previous studies. The GDP of both the exporting and importing countries (Matyas *et al.*, 2000), both countries using the same currency, sharing the same border as well having the same colonial masters all relate positively with intra-regional trade in both REC. On the contrary, the variables distance between the trading countries and the exporting country being landlocked tend to reduce intra-regional trade in the ECOWAS (Raballand, 2003, Agbodji, 2007). The population of both countries is relate positively with intra-regional trade in the ECOWAS, but negatively in the ECCAS. The language is related positively with intra-regional trade in ECCAS (Egger & Lassmann, 2011), but negatively in the ECOWAS.

Table 3. *Determinants of intra-regional trade in the ECCAS region. Dependent variable: total exports*

	Internet			Mobile Phone			RTA (Internet)			RTA (Mobile Phone)		
	FE	RE	PPML	FE	RE	PPML	FE	RE	PPML	FE	RE	PPML
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of GDP for country exporting	0.307	0.615***	1.912***	0.313	0.514***	1.639***	0.306	0.565***	2.185***	0.312	0.521***	1.942***
	(0.990)	(0.0895)	(0.167)	(0.931)	(0.0928)	(0.145)	(0.990)	(0.146)	(0.258)	(0.932)	(0.144)	(0.236)
Log of GDP for country importing	0.391***	0.462***	1.068***	0.233***	0.481***	1.006***	0.399***	0.421***	0.970***	0.238***	0.386***	0.827***
	(0.0746)	(0.0764)	(0.112)	(0.0807)	(0.0820)	(0.102)	(0.0761)	(0.0772)	(0.104)	(0.0823)	(0.0830)	(0.0980)
Log of population of country exporting	-0.966	-0.0285	-0.930***	-3.481*	0.0857	-0.835***	-0.957	0.306*	-0.375***	-3.471*	0.350**	-0.263**
	(2.821)	(0.101)	(0.105)	(2.105)	(0.0955)	(0.111)	(2.824)	(0.175)	(0.125)	(2.107)	(0.173)	(0.127)
Log of population of country importing	0.173*	-0.0134	-0.360***	0.156*	-0.143	-0.401***	0.174*	0.0212	-0.231***	0.156*	-0.0358	-0.235***
	(0.0985)	(0.0964)	(0.0810)	(0.0887)	(0.0911)	(0.0785)	(0.0987)	(0.0958)	(0.0812)	(0.0889)	(0.0898)	(0.0818)
Log of distance	-1.267***	-1.459***	-0.177*	-1.168***	-1.414***	-0.0750	-1.268***	-1.374***	-0.0356	-1.169***	-1.326***	0.00725
	(0.113)	(0.119)	(0.103)	(0.113)	(0.120)	(0.108)	(0.113)	(0.116)	(0.0793)	(0.113)	(0.116)	(0.0812)
Countries trading have the same colonial masters	3.592***	3.878***	0.829***	3.426***	3.713***	0.514**	3.611***	4.036***	0.649***	3.438***	3.907***	0.358
	(0.310)	(0.311)	(0.226)	(0.306)	(0.310)	(0.254)	(0.312)	(0.312)	(0.214)	(0.308)	(0.309)	(0.243)
Countries trading use a common currency	0.720***	0.575**	-0.463	0.558**	0.491*	-0.414	0.724***	0.503*	0.149	0.558**	0.432	0.308
	(0.273)	(0.257)	(0.307)	(0.268)	(0.257)	(0.310)	(0.276)	(0.283)	(0.364)	(0.271)	(0.282)	(0.371)
Countries trading speak same official language	-0.0372	0.374	1.937***	-0.0532	0.467**	1.767***	-0.0853	-0.0462	2.332***	-0.0824	-0.00895	1.849***
	(0.247)	(0.229)	(0.330)	(0.237)	(0.225)	(0.316)	(0.259)	(0.262)	(0.406)	(0.249)	(0.255)	(0.379)
Countries trading share the border	0.298	0.143	1.091***	0.451	0.326	1.330***	0.277	0.124	1.232***	0.438	0.269	1.400***
	(0.336)	(0.349)	(0.309)	(0.332)	(0.349)	(0.314)	(0.337)	(0.344)	(0.322)	(0.335)	(0.343)	(0.315)
Exporting country (origin) is landlocked	3.169***	0.365	2.353***	3.065***	0.401*	2.108***	3.141***	1.093**	3.442***	3.047***	1.004**	3.176***
	(0.627)	(0.242)	(0.400)	(0.616)	(0.242)	(0.333)	(0.629)	(0.506)	(0.342)	(0.619)	(0.504)	(0.329)
Log of Internet of country of exporting	-0.0751	-0.272*	-0.300**				-0.0754	-0.113	-0.351***			
	(0.306)	(0.149)	(0.129)				(0.306)	(0.148)	(0.135)			
Log of Internet of country importing	0.794***	0.394***	0.130				0.792***	0.331**	0.296*			
	(0.178)	(0.151)	(0.181)				(0.178)	(0.154)	(0.179)			
Log of mobile phone of country exporting				-0.0948	0.312**	0.274**				-0.0934	0.167	0.0330
				(0.264)	(0.151)	(0.133)				(0.264)	(0.152)	(0.121)
Log of mobile phone of country importing				1.169***	0.199	0.0380				1.166***	0.372**	0.317**
				(0.178)	(0.153)	(0.150)				(0.179)	(0.156)	(0.136)
Log of number of document of country exporting	-0.144	3.845***	3.664***	0.116	3.674***	3.517***	-0.144	2.459***	0.0832	0.117	2.325***	-0.128
	(1.110)	(0.432)	(0.446)	(1.089)	(0.429)	(0.432)	(1.111)	(0.739)	(0.715)	(1.090)	(0.735)	(0.729)
Log of number of document of country importing	2.226***	2.517***	0.878**	2.251***	2.566***	0.730**	2.239***	2.252***	0.591*	2.259***	2.255***	0.274
	(0.399)	(0.428)	(0.356)	(0.393)	(0.426)	(0.368)	(0.400)	(0.415)	(0.333)	(0.394)	(0.412)	(0.343)
Log of number of day of country exporting	1.351	-3.234***	-1.173***	1.066	-2.680***	-0.647***	1.353	-1.480***	0.980**	1.069	-1.064**	1.406***
	(0.854)	(0.317)	(0.295)	(0.861)	(0.296)	(0.251)	(0.854)	(0.452)	(0.458)	(0.862)	(0.430)	(0.454)
Log of number of day of country importing	0.496*	0.437	1.623***	0.549**	0.387	1.598***	0.501*	0.188	1.633***	0.552**	0.258	1.553***
	(0.280)	(0.291)	(0.289)	(0.256)	(0.271)	(0.225)	(0.281)	(0.284)	(0.284)	(0.256)	(0.263)	(0.211)
EAC							0.499	-3.532***	-2.227***	0.272	-3.566***	-2.596***
							(0.850)	(0.669)	(0.572)	(0.840)	(0.656)	(0.503)
CENSAD							0.257	-2.905***	-6.307***	0.193	-2.925***	-6.235***
							(0.853)	(0.608)	(0.665)	(0.843)	(0.612)	(0.666)
SADC								-3.220***	-2.196***		-3.368***	-2.542***
								(0.457)	(0.721)		(0.451)	(0.725)
COMESA								1.588**	0.690		1.687**	1.045
								(0.707)	(0.806)		(0.690)	(0.663)
Constant	-4.893	-14.07***	-52.58***	35.05	-15.52***	-48.71***	-5.318	-19.27***	-68.18***	34.71	-20.59***	-62.24***
	(31.67)	(2.643)	(4.865)	(25.60)	(2.497)	(4.556)	(31.71)	(3.058)	(7.016)	(25.64)	(2.931)	(6.544)

Fischer test for fixed effects [Prob > F]	18.43			21.07			14.81			17.49	
	0.0000			0.0000			0.0000			0.0000	
Hausman Test [Prob > F]	2249.12			380.02			47.78			118.49	
	0.0000			0.0000			0.0000			0.0000	
Wald statistics / Fisher [Prob > F]	69.71	1596.93		73.19	1608.41		61.90	1798.05		64.95	1824.32
	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000
Time Fixed Effects	NO			NO			NO			NO	
R-squared	0.510	0.9093	0.394	0.522	0.9328	0.408	0.510	0.9633	0.508	0.522	0.9684	0.521
Observations	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Number of id	11	11	11	11	11	11	11	11	11	11	11	11

Source: Computed by authors using data from the WDI, UNCTAD, CEPII and the World Bank Doing Business report. *** $p<0.01$, ** $p<0.05$, * $p<0.1$ indicate significance at 1, 5, and 10 percent. Standard errors in parentheses.

Table 4. *Determinants of intra-regional trade in the ECOWAS region. Dependent variable: total exports*

	Internet			Mobile Phone			RTA (Internet)			RTA (Mobile Phone)		
	FE	RE	PPML	FE	RE	PPML	FE	RE	PPML	FE	RE	PPML
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of GDP for country exporting	0.544	1.376***	0.627***	-0.0255	1.427***	0.351**	0.544	1.582***	0.437**	-0.0247	1.668***	0.132
	(0.990)	(0.130)	(0.162)	(0.852)	(0.375)	(0.159)	(0.990)	(0.123)	(0.211)	(0.852)	(0.0963)	(0.225)
Log of GDP for country importing	0.767***	1.051***	-0.127	0.765***	0.804***	0.120	0.772***	0.977***	-0.170	0.768***	0.822***	0.0695
	(0.124)	(0.119)	(0.192)	(0.0925)	(0.0923)	(0.159)	(0.124)	(0.117)	(0.188)	(0.0925)	(0.0933)	(0.156)
Log of population of country exporting	0.644	0.648***	0.577***	-0.509	0.271	0.895***	0.660	0.235*	0.715**	-0.498	0.130	1.084***
	(1.646)	(0.143)	(0.196)	(1.705)	(0.412)	(0.205)	(1.646)	(0.142)	(0.280)	(1.705)	(0.109)	(0.310)
Log of population of country importing	0.367***	-0.0575	0.835***	0.352***	0.306***	0.559***	0.364***	0.0373	0.883***	0.350***	0.227**	0.609***
	(0.140)	(0.130)	(0.200)	(0.0975)	(0.0972)	(0.157)	(0.140)	(0.128)	(0.195)	(0.0975)	(0.0986)	(0.155)
Log of distance	-1.375***	-1.342***	-0.175	-1.373***	-1.383***	-0.173	-1.378***	-1.305***	-0.152	-1.376***	-1.309***	-0.155
	(0.0870)	(0.0899)	(0.151)	(0.0868)	(0.0871)	(0.152)	(0.0870)	(0.0884)	(0.152)	(0.0869)	(0.0885)	(0.153)
Countries trading have the same colonial masters	1.056***	1.592***	-0.402	1.058***	1.163***	-0.410	1.090***	1.738***	-0.195	1.091***	1.747***	-0.214
	(0.314)	(0.317)	(0.524)	(0.314)	(0.314)	(0.525)	(0.315)	(0.311)	(0.523)	(0.315)	(0.311)	(0.524)
Countries trading use a common currency	1.317***	2.045***	2.020***	1.301***	1.330***	2.048***	1.261***	1.628***	1.503***	1.246***	1.608***	1.535***
	(0.185)	(0.177)	(0.129)	(0.185)	(0.185)	(0.122)	(0.191)	(0.182)	(0.130)	(0.191)	(0.182)	(0.130)
Countries trading speak same official language	-0.674**	-1.334***	-0.886*	-0.670**	-0.775***	-0.904*	-0.670**	-1.206***	-0.686	-0.666**	-1.204***	-0.705
	(0.275)	(0.281)	(0.519)	(0.275)	(0.276)	(0.521)	(0.275)	(0.276)	(0.517)	(0.275)	(0.277)	(0.516)
Countries trading share the border	0.761***	0.725***	1.353***	0.756***	0.733***	1.364***	0.778***	0.864***	1.380***	0.772***	0.868***	1.386***
	(0.141)	(0.146)	(0.114)	(0.141)	(0.141)	(0.115)	(0.142)	(0.145)	(0.116)	(0.142)	(0.145)	(0.116)
Exporting country (origin) is landlocked	1.517**	-1.316***	-1.524***	1.511**	-0.0182	-1.593***	1.520**	-1.393***	-1.631***	1.514**	-1.362***	-1.716***
	(0.624)	(0.174)	(0.179)	(0.622)	(0.454)	(0.171)	(0.624)	(0.158)	(0.195)	(0.622)	(0.157)	(0.192)
Log of Internet of country of exporting	-0.133	0.222**	-0.141				-0.133	0.123	-0.132			
	(0.185)	(0.107)	(0.0990)				(0.185)	(0.103)	(0.0971)			
Log of Internet of country importing	0.0893	-0.365***	0.191*				0.0860	-0.266***	0.206**			
	(0.118)	(0.102)	(0.103)				(0.118)	(0.101)	(0.101)			
Log of mobile phone of country exporting				0.0724	-0.144	0.244				0.0741	0.0374	0.235
				(0.138)	(0.112)	(0.159)				(0.138)	(0.0993)	(0.166)
Log of mobile				0.204*	0.0699	-0.139				0.201*	-0.152	-0.0952

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
phone of country importing				(0.112)	(0.107)	(0.127)				(0.112)	(0.0989)	(0.130)
Log of number of document of country exporting	0.139	-0.929***	0.471	0.137	-0.0171	0.507*	0.139	-0.00284	0.655**	0.137	-0.00782	0.715**
	(0.695)	(0.276)	(0.296)	(0.694)	(0.594)	(0.287)	(0.695)	(0.273)	(0.326)	(0.694)	(0.275)	(0.320)
Log of number of document of country importing	-0.560**	-0.429*	-1.012***	-0.517**	-0.422*	-1.000***	-0.563**	-0.414*	-0.960***	-0.520**	-0.403	-0.936***
	(0.245)	(0.254)	(0.233)	(0.245)	(0.245)	(0.251)	(0.245)	(0.250)	(0.234)	(0.245)	(0.251)	(0.252)
Log of number of day of country exporting	-0.358	-0.465**	-0.582***	-0.249	-0.343	-0.444**	-0.357	-0.670***	-0.637***	-0.250	-0.744***	-0.515**
	(0.488)	(0.206)	(0.211)	(0.489)	(0.408)	(0.206)	(0.488)	(0.191)	(0.222)	(0.489)	(0.187)	(0.214)
Log of number of day of country importing	-0.403***	-0.642***	-0.0372	-0.337**	-0.372**	-0.141	-0.398***	-0.603***	-0.0604	-0.332**	-0.547***	-0.148
	(0.152)	(0.157)	(0.130)	(0.150)	(0.150)	(0.132)	(0.152)	(0.155)	(0.128)	(0.150)	(0.154)	(0.130)
CENSAD							0.752	1.299***	1.307***	0.734	1.325***	1.303***
							(0.636)	(0.143)	(0.236)	(0.636)	(0.143)	(0.243)
Constant	-26.77	-41.62***	-20.64***	2.605	-40.00***	-21.15***						
	(21.21)	(1.914)	(2.427)	(18.89)	(4.696)	(2.473)						
Fischer test for fixed effects [Prob > F]	19.05			19.95			12.30			12.93		
	0.0000			0.0000			0.0000			0.0000		
Hausman Test [Prob > F]	243.61			50.11			174.45			158.9		
	0.0000			0.0000			0.0000			0.0000		
Wald statistics / Fisher [Prob > F]	133.51	4295.75		134.04	2209.43		125.77	5090.58		126.25	5075.69	
	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	
Time Fixed Effects	NO			NO			NO			NO		
R-squared	0.544	0.9534	0.500	0.545	0.8644	0.497	0.544	0.9721	0.510	0.545	0.9699	0.506
Observations	1,820	1,820	1,820	1,820	1,820	1,820	1,820	1,820	1,820	1,820	1,820	1,820
Number of id	14	14	14	14	14	14	14	14	14	14	14	14

Source: Computed by authors using data from the WDI, UNCTAD, CEPII and the World Bank Doing Business report. *** p<0.01, ** p<0.05, * p<0.1 indicate significance at 1, 5, and 10 percent. Standard errors in parentheses

5. Conclusion

The objective of this paper was to carry out a comparative analysis of the trade facilitation impact on the intra-regional trade between ECCAS and ECOWAS. The descriptive analysis of the trade facilitation indicators, economic infrastructure (transport, energy and ICT) and customs environment indicators showed that road quality and access to electricity is better in ECOWAS countries. The ECCAS countries are more advanced in the mobile telephone utilization. It is worth noting that the internet utilization remains low in both REC. Moreover, the economic infrastructure development program is part of the strategy identified to promote trade development in both REC. In average, the number of days just as the number of documents to export in ECCAS is twice that of ECOWAS. Export cost remained high in both REC, resulting in higher intra-ECOWAS trade than ECCAS. Estimations revealed that the number of day of the exporting and importing countries relate negatively and significantly with intra-regional trade in ECOWAS, while only the number of day of the exporting country has a negative and significant impact on the intra-regional trade in ECCAS. That of the importing country is always positively correlated with intra-regional trade in ECCAS region. The number of document of the exporting and importing countries relate positively and significantly with intra-regional trade in ECCAS region,

as that of the exporting country in ECOWAS. The impact of the increase in the number of documents and the number of days reduces more trade in ECCAS than ECOWAS. Internet usage has a negative and significant impact for exporting country in the ECCAS while a positive and significant impact for importing in ECCAS and ECOWAS. Looking at mobile phones, the level of the exporting and importing country related positively and significantly in the ECCAS and only related positively and significantly for the importing country in ECOWAS. Belonging to CENSAD enhances trade creation in ECOWAS while engendering trade diverting in ECCAS like EAC, SADC.

These findings have policy implications to facilitate trade. A good implementation of economic infrastructure development program mentioned in the Regional Integration Strategy Document, specifically, access to internet, tarring of national and regional roads help to minimize the constraints of development in the private sector which is the source of economic diversification will stimulate trade in ECCAS and ECOWAS. However, to reach the intra-ECOWAS trade level, ECCAS countries have to concentrate on trade development strategy to diversify their economies and be complementary, thereby minimizing trade diversion.

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