Research Article

Trade Integration in West Africa: Does the Quality of Institutions Matter?

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ABSTRACT

When asked why the level of intra-regional trade in West Africa is low despite regional integration efforts, the literature highlights the poorly diversified structure of economies, the non-application of community arrangements, the inconsistency or mismanagement of trade policies, supply constraints, and inadequate transport infrastructure. Without calling into question the relevance of these factors, this paper investigates the contribution of institutional variables to the explanation of trade flows in West Africa over the period from 1996 to 2018. Using a gravity model, the study shows that institutional quality matters. The quality of institutions in the Economic Community of West African States (ECOWAS) countries influences bilateral trade. Political stability is an essential component of the quality of the institutions that determine trade in the ECOWAS zone. These results suggest that more than trade liberalization is needed to deepen trade integration and that institutional reforms and harmonization in West Africa are required.

1. INTRODUCTION

African policymakers and analysts generally see regional integration as a suitable strategy for raising the level of intra-regional trade, stimulating economic development, and ensuring that countries are embedded into the world economy. Regional integration might also serve as a tool to accelerate the economic transformation of African countries through economies of scale, increased productivity, more effective mobilization of capital, and enhanced regional value chains. From this perspective, several Regional Economic Communities (RECs) have been formed in Africa. Like other African sub-regions where several economic communities coexist, West Africa has two major RECs: the West African Economic and Monetary Union (WAEMU)[1] and the Economic Community of West African States (ECOWAS).[2] The WAEMU zone, which has had a single currency since the years of independence, has deepened the regional integration of its member countries since 1994 through gradual tariff dismantling. This process was completed with the establishment of a customs union in 2000 with a functional Common External Tariff (CET). ECOWAS, for its part, aims to create a monetary union. Since WAEMU member states already have a single currency, ECOWAS encouraged non-WAEMU countries to come together to form a monetary zone, which would later merge with WAEMU to form an ECOWAS-wide monetary union. This led to the establishment of the West African Monetary Zone (WAMZ) in 2000. With repeated postponements of the launch of the WAMZ's single currency, ECOWAS has, since 2015, reverted to a modified one-track approach where all member states (both WAEMU and non-WAEMU countries) will form a new ECOWAS-wide monetary union. ECOWAS also became a customs union in 2015 with the implementation of its CET. The ECOWAS customs union brings together WAEMU and non-WAEMU countries and, since its establishment, the WAEMU customs union has ceased to function as a separate union.

Despite remarkable regional integration efforts in West Africa, the level of intra-regional trade remains low (around 9.2% and 13.3% on average over the period from 2014 to 2018 for intra-ECOWAS and -WAEMU exports, respectively [United Nations, UNCTADSTAT base 2019]). West African countries continue to trade primarily with their former colonizers and increasingly with emerging economies (including China). Explanations for why the level of trade in West Africa is low despite regional integration efforts generally emphasize the weak complementarity of economies in relation to their poorly diversified structures. Other factors are also highlighted, such as the

non-application of community arrangements and rules, the inconsistency or poor management of regional trade policies (Agbodji, 2007), supply constraints (Evlo, 2009), and the inadequacy and poor quality of transport infrastructure (Gammadigbe, 2017). Both theoretical and empirical works focused on West Africa have favored this path of research, neglecting the role of institutions. Thus, few studies have explored the contribution of institutions to the strengthening of regional integration achievements in West Africa.

The issue of deepening regional integration is of particular importance in the context of developing the economies of West African countries. The high poverty rates prevailing in many African countries make it imperative that high economic growth rates be achieved. Although regional integration can promote economic growth through bilateral trade flows among member countries, ECOWAS countries are poorly integrated despite several years of regional economic integration. The recent establishment of a CET in ECOWAS can pave the way for the harmonization of trade laws and practices and institutional reforms conducive to intra-zone trade. In fact, the recent wave of international trade literature has shown that trade performance also depends on the quality of institutions (Anderson and Young, 2006; Harrison and Tang, 2005; Lavallée, 2006; Doukouré, 2011). Strong institutions positively influence the level of trade through reduced transaction costs and uncertainty. It follows that institutional fragility in West Africa—characterized by inefficient public services, cumbersome administrative and customs procedures, and corruption—undermines intraregional trade. As the quality of institutions constitutes an important factor influencing trade, the present study seeks to analyze the specific case of West African countries.

The study follows this new line of research by examining the contribution of institutional quality to the deepening of regional integration, in particular, the facilitation of intra-community trade in West Africa. Thus, the main issue of this study can be summarized as follows: Does the quality of institutions drive the intensification of trade in West Africa? Does institutional weakness explain the low level of intra-ECOWAS trade? And do West African countries with relatively more efficient institutions trade more among themselves? The objective of this research is to analyze, from an empirical perspective, the relationship between the quality of institutions and the performance of intra-community trade in West Africa.

The remainder of the article is structured as follows. Section 2 provides a review of the theoretical and empirical literature on the effects of institutional quality on bilateral trade. The empirical review is extended to specifically addressing regional integration issues in West Africa. Section 3 provides a descriptive analysis of the quality of institutions in West African countries. Section 4 is devoted to the methodological approach of the study. Section 5 presents and discusses the results. Section 6 concludes and offers recommendations.

2. LITERATURE REVIEW

In this section, we present a theoretical and empirical review of the effects of institutional quality on bilateral trade.

2.1. Theoretical Background

In the literature, institutions are defined as the formal and informal rules that govern human interaction and exchange. They can be divided into two components: formal institutions (such as rules, laws, and constitutions) and informal institutions (such as the norms of behavior and conventions). They structure the motivations in trade, and in political, social, and economic domains (North, 1990), and they have the nature of reducing uncertainty. The literature on the effects of institutional quality on international trade can be divided into two major branches. According to the first branch, the good quality of partner countries' trading institutions increases bilateral trade insofar as it reduces the costs and risks inherent to international trade. Strong institutions provide important comparative advantages (Levchenko, 2004; Nunn, 2007). Indeed, the more quality institutions an exporter has, facilitating commercial contracts and optimizing order management, the more confidence and willingness to trade that current and potential partners will have in the exporter's products (Levchenko, 2004). The first theoretical contribution comes from Anderson and Marcouiller (2002). The authors show that weak institutions increase the risks of non-compliance with contracts and predation or corruption. Lessons from their import demand model in an uncertain world show that trade insecurity reduces bilateral imports because it increases the price of tradable goods in a way equivalent to a hidden tax or customs duty. The lower the quality of national institutions, the higher the tax. Moreover, weak legal frameworks, and their corollary non-compliance with contracts, increase uncertainty about transaction performance and consequently reduce the level of transactions (Lavallée, 2006). This negative impact is particularly important for international transactions because they systematically involve irrecoverable costs and, in the case where the contract is broken, alternative options are rare and their search expensive (De Sousa and Disdier, 2006).

For other authors, the impact of the quality of institutions on bilateral trade depends on certain determinants of trade (infrastructure and domestic investment). For example, Méon and Sekkat (2004), Rodrik (1995), Mauro (1995), and Elbadawi (2002) argue that institutional quality has an indirect impact on international trade through its effects on key variables such as domestic investment. Poor institutional quality is also associated with inadequate expenditure on maintaining public infrastructure (Mauro, 1998), to which trade flows are very sensitive (Limão and Venables, 2001).

According to the second branch of the literature on the effect of institutions, the poor quality of institutions can actually be socially or economically beneficial. Such an environment encourages corruption, which may have a positive impact on the effectiveness or even the efficiency of agents (Méon and Weill, 2010). Corruption is presented in this perspective as an element to compensate for the deficient

functioning of public institutions. Consequently, the poor quality of institutions could positively influence the process of capital accumulation (Mironov, 2005) and economic growth (Méndez and Sepúlveda, 2006).

Leff (1964) and Huntington (1968) argue that corruption promotes economic efficiency by overcoming rigidities imposed by governments. According to these authors, corruption generally facilitates economic life. This idea was then taken up and developed and many theoretical studies show that corruption is a vector of efficiency. This is an optimum of the second rank and could be explained by the existence of an institutional environment that is too restrictive to the extent that economic agents develop behaviors in order to carry out their economic activities. For example, an agent may be well informed of the situation and know what to pay (in addition to the official fees) to settle commercial transactions within a reasonable time. In the case of trade, the development of smuggling and informal transactions can be explained in this way (Farzanegan, 2009).

Myrdal (1968) and Bardhan (1997) argue that public officials often create delays or red tape solely for the purpose of collecting bribes. They are thus challenging this positive idea of corruption. Similarly, Kaufman and Wei (1999) show that corruption is endogenous to the setting of administrative rules and procedures. Moreover, second-best theories imply that corruption may be intended to speed up procedures or overcome administrative obstacles, which may not actually exist (Lavallée, 2006). For example, the capacity of public officials to speed up an administrative procedure can be very weak, especially when it involves different interlocutors (Shleifer and Vishny, 1993), thus making corruption ineffective as a tool for reducing inefficiency.

2.2. Empirical Works

The empirical literature on the effect of institutions on trade generally shows that the poor quality of institutions has a negative influence on trade. Using survey data from the World Economic Forum on a sample covering exports from the United States to 48 countries, more than half of which are industrial countries, Anderson and Marcouiller (2002) find that trade increases substantially with the quality of institutions. De Sousa and Disdier (2006) also conclude that the low quality of partner country institutions in trade reduces bilateral trade. Indeed, using the border effects method, De Sousa and Disdier show that the good quality of legal systems is an important determinant of European Union (EU) exports. Lavallée (2006) also finds a positive relationship between the good quality of institutions and export growth, based on a gravity model and a sample of 148 countries over the period from 1984 to 2002. This suggests that poor quality institutions are holding back the expansion of international trade.

However, the study by Berkowitz et al. (2006) on the impact of the quality of legal institutions on bilateral imports provides mixed results. Indeed, their estimates, based on the governance indicators of the International Country Risk Guide on a sample of 55 countries [21 of which are high-income Organisation for Economic Co-operation and Development (OECD) member countries], show that the quality of a country's legal institutions has no impact on its imports when the specific effects and fixed temporal effects of importer and exporter countries are introduced into the model. Berden et al. (2013) analyzed how bilateral Foreign direct investment (FDI) and bilateral trade flows are affected by different governance measures, using the gravity model. They observed, based on the Voice and Accountability Index of the World Bank Worldwide Governance Indicators (WGIs), that a higher degree of pluralism reduces exchange levels (likely by increasing the 'voice' of more protectionist less-skilled workers), decreases FDI levels. In contrast, greater political stability reduces trade, but increases both the likelihood and the amount of FDI inflows. Moreover, the level of exchange, the level of FDI, and the likelihood of FDI are improved by better regulatory efficiency.

The positive impact of institutional efficiency on trade appears to be seen in recent studies. For instance, the study by Martínez-Zarzoso and Márquez-Ramos (2018) examines the relevance of governance using a gravity model and a set of institutional quality indicators to facilitate trade and the emergence of Middle East and North Africa (MENA) exporters into the global economy. Their key findings suggest that, for bilateral export flows in general and for MENA countries in particular, the quality of governance in the respective exporter and importer countries seems to be significant. They also suggest that products from MENA countries are favored by similar levels of regulatory efficiency and the rule of law.

Concerning the WAEMU zone, Doukouré (2011) shows a deterioration in the overall quality of institutions in the zone over the period from 1996 to 2007. The author then estimates a gravity model using Heckman's two-step method, and observes that the poor quality of WAEMU institutions is not an obstacle to export growth. In particular, corruption would encourage WAEMU exports. However, these results are not exempt from the criticism of the omitted variable (Baldwin, 2005), since several important determinants such as the official language community, the bilateral real exchange rate, bilateral exchange rate volatility, and the quality of infrastructure are not taken into account in the model.

This literature review is now extended to empirical works that have analyzed the determinants of bilateral trade in West Africa with particular emphasis on the contribution of regional integration. Carrère (2004) assesses the influence of regional agreements on Sub-Saharan African (SSA) member countries' trade and compares the respective effects of preferential trade agreements and currency unions over the 1962–1996 period. In a panel with specific effects, a gravity model was estimated using the Hausman–Taylor methodology. The findings suggest that African currency unions and RECs caused a substantial increase in trade between member countries during their implementation period. Agbodji (2007) specifically analyses the case of WAEMU, taking into account informal border trade. Taking trade as a dynamic process, the article estimates an augmented gravity model with the Arellano and Bond (1991) approach using the Generalized Moment Method (GMM). The findings indicate that membership in the common monetary zone (WAEMU) and the introduction of economic reforms have had a substantial impact on the diversion of imports and exports. The use of the GMM method has the benefit of solving

potential risks of endogeneity among variables. The article did not, however, specify how the issues related to the gravity model estimation, in particular the handling of zero trade in the sample, were handled. Inadequate treatment of zero trade in the calculation of the effect can relate to bias (Baldwin, 2005).

Avom and Gbetnkom (2005) address the problem of zero trade using the Tobit method, a non-linear estimation method that explicitly recognizes the existence of zero values of the dependent variable. In their analysis of the determinants of bilateral trade in WAEMU, the authors considered two sub-periods (1990–1994 and 1996–2000). Their estimates show that the variable capturing regional integration is significant over the period from 1996 to 2000. The authors attribute this result to the economic reforms of the 1980s and 1990s. However, these results are not exempt from the criticism of the omitted variables (Baldwin, 2005), because several important determinants, such as sharing a common border, the bilateral real exchange rate, bilateral exchange rate volatility, and infrastructure quality, are not taken into account in the gravity model.

Diop (2007) arrives at results close to those of Rose et al. (2000) by finding a multiplier coefficient of about three out of a sample of 13 ECOWAS countries. The method deployed is that of Ordinary Least Squares (OLS) in cross-section, the variables being transformed into averages of over the period from 1997 to 2004. The methodological shortcomings of this research are linked to the neglect of zero trade bias. Moreover, important determinants such as the bilateral real exchange rate, bilateral exchange rate volatility, and infrastructure quality were not incorporated into the econometric model. This criticism also concerns the work of Bangake and Eggoh (2009), who find, using panel techniques (fixed effects and random effects), a positive and significant impact of the CFA franc on intra-WAEMU trade. However, the problem of zero trade flows has been addressed by adding an arbitrary constant to the dependent variable. Other empirical studies (Anyanwu, 2003; Ajayi, 2005; Afesorgbor, 2012; Ndong and Mboup, 2013; Coulibaly et al., 2015) arrive at a positive impact of membership of an REC with, however, important differences in the levels of significance and magnitude of the effect.

This article aims to enrich the literature on the link between trade integration and institutional quality in West Africa. We assess the trade effects of the quality of partner countries' institutions using a gravity model. We analyze precisely the effects of the different components of institutional quality (political stability, the rule of law, the effectiveness of public administration, the quality of regulation, and the control of corruption) on bilateral trade in ECOWAS. Finally, the robustness of the results is checked on the basis of several tests.

3. STYLIZED FACTS

Assessing the quality of formal institutions is relatively complex in terms of its different dimensions. The method generally used in the literature consists of constructing precise indicators focusing on a given dimension. The overall indicator of governance or institutional quality that we use in this study corresponds to that proposed by Kaufmann et al. (2010), which combines six dimensions of governance or institutions: citizen participation and accountability, political stability and the absence of violence, the effectiveness of public authorities, the quality of regulation, the rule of law, and the control of corruption.

The first indicator—citizen participation and accountability—reflects perceptions of the extent to which citizens of a country can participate in the choice of their government, freedom of expression, freedom of association, and free media. The second—political stability and the absence of violence—measures perceptions of the likelihood of political instability and/or violence for political purposes, including terrorism. The effectiveness of public authorities reflects perceptions of the quality of public services and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to these policies. Quality of regulation captures the government's ability to formulate and implement sound policies and regulations that enable and promote private sector development. The rule of law indicator assesses the extent to which economic agents trust and respect the rules of society, and in particular the quality of contract enforcement, property rights, and the police and the courts, as well as the likelihood of criminal acts and violence. Finally, the control of corruption index represents the extent to which public power is exercised for private purposes, including small and large forms of corruption, and the 'capture' of the state by elites and private interests.

The various indicators of governance or institutional quality combine the views of a large number of survey respondents from business, citizens and experts, non-governmental organizations, and international organizations. They are rated on a scale of −2.5 to 2.5 so that positive scores reflect relatively good institutional quality. In order to describe the state of institutions in West Africa and in relation to the objectives of this research, we calculate an overall index of the quality of institutions by taking an arithmetic average of six dimensions: political stability, the effectiveness of public authorities, the quality of regulation, the rule of law, citizen participation and accountability, and the control of corruption. The index has been transformed so as to have only positive values on a scale from 0 to 100: $QI'_{it} = 20(2.5 + QI_{it})$,[3] with QI'_{it} as the transformed index for each country i and $QI_{it} = \frac{1}{6}\sum_{j=1}^{6} q_{jt}$ as the average of the sub-indices q_{jt} of country i at period t.

Table 1 represents the average of the index for each West African country over the period from 1996 to 2018. Table 1 shows that the average score of the institutional quality indices in West Africa is below 50%. Over the study period, the average of the scores of the sub-indices of institutional quality is also below 50%, reflecting the generalized weakness of the various dimensions of institutional quality. Cape Verde represents the country with the best quality of institutions in the ECOWAS zone, with a score of 60.1%, i.e., above 50%. This ranking remains

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[3]Bearing in mind that the sub-indexes of the quality of institutions range between −2.5 and +2.5, this linear transformation ensures that the new variable QI'_{it} varies from 0 to 100. Thus when QI_{it} takes the value of −2.5 the variable QI'_{it} is equivalent to 0 and is equal 100 when QI_{it} is set to +2.5.

Table 1 | Quality of institutions in West African countries (average over 1996–2018)

Country	InstQual	Corrup	GovEffec	RegQual	RulLaw	PolStab	VoiceAcc
Benin	46.2	38.3	40.9	42.4	41.7	58.8	55.4
Burkina Faso	42.7	46.0	37.3	44.7	39.6	44.2	44.3
Cape Verde	60.1	65.5	52.5	46.7	61.5	67.6	67.1
Cote d'Ivoire	31.9	34.4	32.5	37.6	28.6	24.9	33.2
Gambia	40.8	38.6	37.6	41.2	42.5	54.1	30.5
Ghana	49.5	46.7	48.3	47.7	49.9	49.0	55.7
Guinea	27.9	29.8	29.3	31.5	23.6	24.6	28.3
Guinea-Bissau	27.9	25.0	24.4	27.6	22.3	34.6	33.5
Liberia	26.8	30.0	21.1	22.4	23.8	25.3	38.2
Mali	40.7	36.3	33.1	41.4	41.5	41.8	50.2
Niger	37.0	34.6	34.1	37.8	37.8	37.5	40.2
Nigeria	27.7	26.7	29.5	32.2	26.8	15.7	35.6
Senegal	46.6	46.4	44.6	46.2	47.1	43.7	51.9
Sierra Leone	32.2	33.0	24.9	29.3	29.4	36.2	40.5
Togo	33.1	32.5	25.3	35.2	33.4	42.2	30.0
Mean	**38.1**	**37.6**	**34.4**	**37.6**	**36.6**	**40.0**	**42.3**

Source: Author, data from WGI (2019). InstQual, institutional quality; Corrup, control of corruption; GovEffec, government effectiveness; RegQual, regulation quality; RulLaw, compliance with the rule of law; PolStab, political stability; VoiceAcc, citizen participation and accountability.

valid when considering all the sub-indices of institutional quality, except for the quality of regulation. The largest economy in West Africa, Nigeria, has the lowest institutional quality score in West Africa. In terms of corruption control, government effectiveness, and compliance with the rule of law, all countries are below 50% except Cape Verde. The most politically stable West African countries over the period from 1996 to 2018 are Cape Verde, Benin, and the Gambia. Political instability in countries such as Liberia, Cote d'Ivoire, Guinea, and Nigeria would have degraded the scores of these countries, which ranked last over the period in question. The quality of regulation is the indicator that all West African countries are struggling to improve. Indeed, for this dimension of institutional quality, no country scores above 50%. Ghana presents the highest average score over the study period, of about 47.7%.

Some stylized facts about bilateral exports in West Africa in 2018 are presented in Table A1. Bilateral exports are defined as total exports in millions of dollars from one country *i* to another country *j* in West Africa. For the purpose of the stylized facts analysis and to facilitate the discussion of the figures, we report bilateral exports to total intra-regional exports to highlight the share of each country pair. Table A1 shows an asymmetric distribution of bilateral exports between pairs of countries in relation to their economic size. Indeed, it can be noted that there is an absence of export flows between several pairs of countries. For example, while exports from the Cape Verde to other ECOWAS countries were almost non-existent in 2018, Nigeria, the economic giant of the zone, occupies a predominant place in intra-zone trade. Its exports to Cote d'Ivoire, Ghana, and Senegal account for 18.61%, 11.69%, and 8.84% of intra-zone exports, respectively. Exports from these countries to Nigeria represent 1.80% for Côte d'Ivoire, 0.73% for Ghana, and 0.27% for Senegal.

To explore the relationship between the quality of institutions and trade integration in West Africa, Figure 1 (Graph 1A) depicts a scatter plot of bilateral exports and the quality of institutions in the exporting country, and Figure 1 (Graph 1B) shows a scatter plot of bilateral export pairs and the quality of institutions in the importing country. These two graphs show a positive relationship between the quality of institutions and bilateral trade. The graphs show low elasticity between the two variables. However, this relationship does not take into account other determinants of bilateral trade.

Figure 1 (Graph 1A and 1B) do not take into account the combined effect of institutions in the countries of the two trading partners. To illustrate this, we first calculate an index that takes into account the interaction between the quality of institutions in the two countries. The proposed index (QI'_{ijt}) is calculated as the logarithm of the product of the indices of the quality of the institutions of the two countries. Second, we consider similarity measures of the quality of institutions between the two partner-countries. Hence, we investigate whether the similarity of the quality of institutions makes a difference in bilateral trade. For this purpose, we use a simple method to construct indicators of similarity, as in Martínez-Zarzoso and Márquez-Ramos (2018). The following equation is applied to construct the similarity of the quality of institutions (SI_{ijt}) from the WGIs used to compute the quality of institutions (QI'_{it}):

$$SI_{ijt} = \frac{\min(QI'_{it}, QI'_{jt}) + 1}{\max(QI'_{it}, QI'_{jt}) + 1} \tag{1}$$

where QI'_{it} denotes the quality of institutions of country *i*. The similarity of institutions index lies between 0 and 1 and is maximized if both *i* and *j* countries have the same level of institutional quality in year *t*. For diverging levels of institutional quality between the two countries, the indicator approaches zero.

Figure 2 (Graph 2A) below shows a positive relationship between the quality of both partners' institutions and bilateral trade. Using the similarity index of the quality of institutions calculated in Equation (1), Figure 2 (Graph 2B) also shows that beyond the quality of the institutions, the similarity of the quality of their institutions is a non-negligible factor in the development of trade. It should be noted that
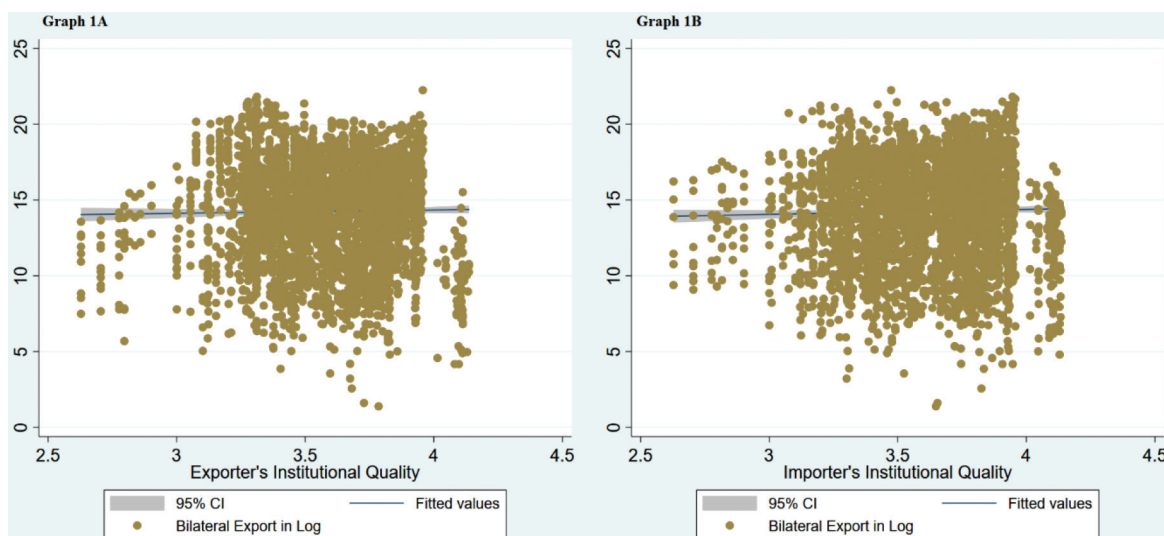
Figure 1 | Bilateral exports and institutional quality of exporter and importer countries (1996–2018). *Source*: Author. The data cover Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.
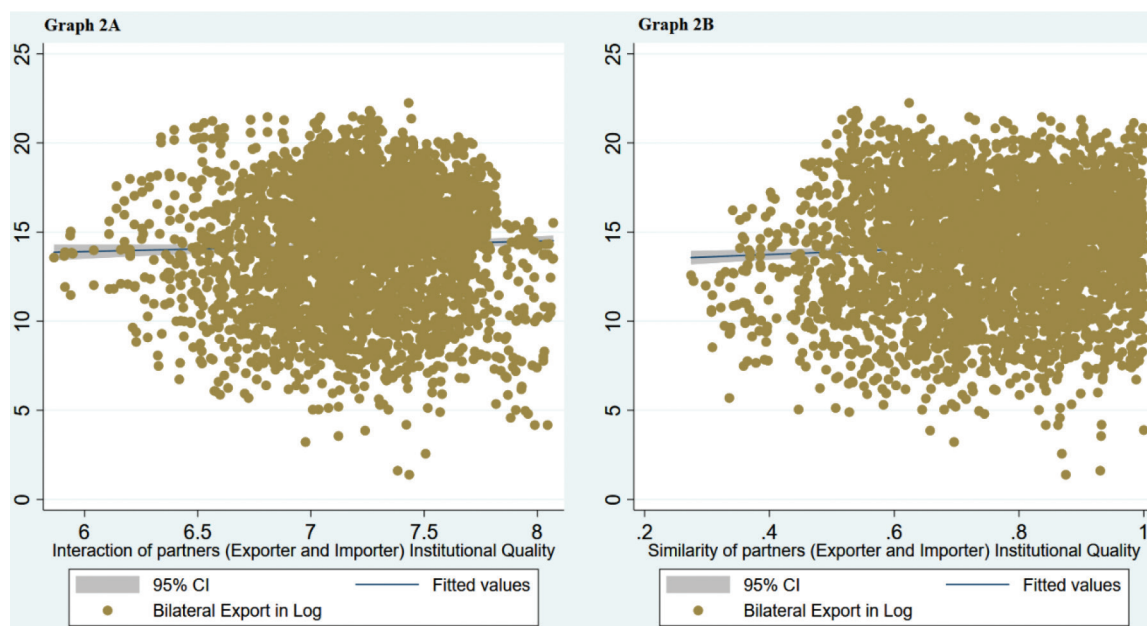
Figure 2 | Quality, similarity of the quality institutions, and bilateral exports in West Africa (1996–2018). *Source*: Author. The data cover Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

the above graphs show very weak positive relationships. We extend this descriptive analysis with an econometric analysis, which is able to shed light on the relationship between our variables of interest after controlling for other determinants of trade.

4. METHODOLOGY

Our econometric investigation of the effect of institutional quality on bilateral trade in West Africa is based on an augmented form of the standard gravity model. The gravity model has been widely used in the literature since the work of Tinbergen (1962), despite the lack of theoretical underpinning for this model in the beginning. It was not until the mid-1970s that important theoretical developments emerged. Anderson (1979) was the first researcher to derive the expression of the gravity equation from a model that involves product differentiation. Subsequently, contributions from other works have not only improved the previous theoretical framework but have also proposed further extensions (see, for example, Bergstrand, 1985, 1989; Helpman, 1987; Oguledo and MacPhee, 1994; Deardorff, 1998; Hummels and Levinsohn, 1995; Anderson and Wincoop, 2001; Evenett and Keller, 2002). Empirically, it has been mobilized to analyze the impact of regional integration on bilateral trade generally, but specifically for West Africa (Anyanwu, 2003; Carrère, 2004; Ajayi, 2005;

Avom and Gbetnkom, 2005; Agbodji, 2007; Diop, 2007; Bangake and Eggoh, 2009; Afesorgbor, 2012; Coulibaly et al., 2015). After presenting the empirical model, we introduce the estimation strategies as well as the data and their sources.

4.1. Empirical Model

The gravity model suggests a 'normal' level of bilateral trade and thus, by introducing dummy variables relating to membership of an REC or currency union, these variables capture the 'atypical' levels of trade resulting from regional integration. In its simplest expression, the gravitational equation for any couple of country couple (i, j) is as follows:

$$X_{ij} = \alpha_0 \text{GDP}_i^{\alpha_1} \text{GDP}_j^{\alpha_2} \text{DIST}_{ij}^{\alpha_3} A_{ij}^{\alpha_4} u_{ij} \tag{2}$$

where X_{ij} represents bilateral exports; GDP_i (GDP_j) represents the Gross Domestic Product (GDP) of an exporter (importer); and the distance between the capitals (or economic centers) of the two countries is denoted by DIST_{ij}. A high level of income demonstrates a high level of production in the exporting country, which increases the supply of products for export; α_1 is thus supposed to be positive. As a greater income level in the importing country indicates higher imports, the coefficient of GDP_j, α_2, is also expected to be positive. The coefficient of distance is supposed to be negative as it is a proxy of all potential sources of trade costs. Any other factors promoting or prohibiting trade between pairs of countries are represented by the variable A_{ij}, and u_{ij} is the error term. The variable A_{ij} usually involves dummy variables for trading partners that share a common language, colonial links, and a common border, as well as dummy trade partner variables that measure the impact of preferential trade agreements. To address our research question and for estimation purposes, in addition to control variables, we introduce institutional variables and dummy variables to capture the different dimensions of regional integration in West Africa. Thus, the log-linear augmented gravity model is as follows:

$$X_{ijt} = \alpha_0 + \gamma IQ_{ijt} + \lambda G'_{ij} + \theta Z'_{ijt} + \eta RTA'_{ijt} + \mu_{ij} + \nu_t + \epsilon_{ijt} \tag{3}$$

The dependent variable X_{ijt}, which measures the level of trade integration, is the logarithm of total exports of goods and services from country i to country j over period t. The main variable of interest in this research is the logarithm of product of the quality indices of partner countries' institutions (IQ_{ijt}). It captures the combined and interactive effect of the overall quality of institutions in countries i and j. This variable will be replaced by the similarity of the quality of institutions (SI_{ijt}), an alternative specification of Model (3). The quality of institutions is approximated by the arithmetic average of six transformed sub-indices (Section 3): political stability, rule of law, effectiveness of public services, citizen participation and accountability, control of corruption, and quality of regulation. The similarity of the quality of institutions is calculated with Equation (1) in Section 3. A positive sign is expected for the parameter γ.

The G'_{ij} vector represents gravity model variables such as distance, common official and ethnic language, common border, and landlockedness. The distance in logarithm (DIST_{ij}) can be used to approximate the transport costs of the products from one country to another. The greater the distance between the two partners, the higher the transportation costs. Sharing a common border influences the trade of goods and services through geographical proximity. It is captured by a dummy variable Border_{ij}, which takes the value of 1 if the two countries share a common border and 0 otherwise. The variable 'landlockedness' (Landlocked_{ij}) is equal to 1 if at least one of the countries is landlocked and 0 if not. This makes it possible to estimate the effect on trade of countries that do not have an opening to the sea. A common official language (LangOff_{ij}) and common ethnic language (LangEthn_{ij}) should positively influence bilateral trade in goods and services, since they determine consumption patterns.

Other determinants of trade that change over time are included in the Z'_{ijt} vector. The logarithm of the GDP and the logarithm of population size (Pop) of the importer and the exporter are indicators of the potential size of the market and supply capacity. We include these variables separately for the importing and exporting countries. The higher these variables, the more trading opportunities that are available to both partners. They are supposed to positively influence trade. The variable Exch_{ijt} measures the logarithm of the bilateral exchange rate of the partner countries, while Vol_{ijt} captures the effect of the volatility of the nominal bilateral exchange rate. The annual bilateral exchange rate is the average of the monthly bilateral exchange rate over the year. Volatility is measured by the standard deviation of the logarithm of the monthly nominal exchange rate of the current year.

The RTA'_{ij} vector represents the variables related to the trade integration impulses in the region. It includes the implementation of the CET of WAEMU and ECOWAS, and the common currency shared by WAEMU countries. The variable CET_WAEMU_{ijt} captures the assumed positive effect of trade integration in the region. It captures the effects of the implementation of the WAEMU CET from 2000 to 2014. Indeed, the deepening of regional integration with the abolition of tariffs and the implementation of community programs in the field of infrastructure can promote trade. Thus, a positive sign of the coefficient of this variable is expected. For WAEMU country pairs, it takes 1 from 2000 to 2014, 0 otherwise, and 0 if not for non-WAEMU pairs. We expect a positive sign for the coefficient of this binary variable. The variable CET_ECOWAS_{ijt} captures the effect of the implementation of the ECOWAS CET from the year 2015. This variable is a dummy that takes a value of 1 starting from the year 2015 and 0 before. We also account for the effect of the common currency in the WAEMU zone. The variable CU_{ij} is a dummy variable that takes the value of 0 if the country pair belongs to the WAEMU zone and 0 otherwise.

The term ϵ_{ijt} constitutes the stochastic error, ν_t is a time-fixed effect, whereas μ_{ij} is an effect specific to each pair of countries, fixed or random.

4.2. Estimation Strategy

We use several techniques to estimate the effect of institutional quality on regional trade in West Africa. Our choice of estimation methods is based on a methodological review of the works identified in the literature and the need to circumvent certain econometric difficulties that a single method cannot manage. The standard gravity model as defined in Equation (3) is atheoretical, according to Anderson and van Wincoop (2003), Feenstra (2004), and Baier and Bergstrand (2007), among others, because it does not really account for the theoretically motivated Multilateral Resistance Terms (MRTs), referring to the market indices of exporters and importers for all trading partners and representing the general equilibrium effects that mean that trade between any given pair of countries also depends on the prices of the remaining possible trading partners of that pair of countries. The choice of approach to account for MRTs depends on the variable of interest in the study. If the study focuses on the coefficient of a bilateral variable, unbiased estimates of the coefficient of this variable can be obtained by adding time-varying importer and exporter dummies or country-pair dummy variables (Anderson and van Wincoop, 2004; WTO, 2012). The above-mentioned country effect method offers accurate estimations of the gravity parameter estimates, but has a major disadvantage: it prevents the direct estimation of the partial effects of country-specific independent variables. There are two possibilities available in the literature for fixing this issue: to use time-invariant exporter and importer dummies in a short sample duration, or to measure the remoteness variable (WTO, 2012; Head and Mayer, 2014). In this study, the MRTs with respect to the time dimension of the sample and to account for possible omitted variables, were approximated by remoteness and included in all the regressions. Remoteness variables are calculated as follows:

$$\text{Remoteness}_i = \sum_j \frac{\text{DIST}_{ij}}{\text{GDP}_j / \text{GDP}_R} \tag{4}$$

The remoteness variable, therefore, calculates the average weighted distance of a country from its trading partners (Head, 2003), where the weights are the partner countries' shares of regional GDP (denoted by GDP_R).

When estimating the effect of trade policies, a problem of endogeneity also occurs in gravity models. Due to omitted variable bias, endogeneity problems can also occur. The issue of the endogeneity of regional trade agreements is not easily solved. The effects of institutional variables, however, are the main aim of this paper. In addition, using country-pair specific effects and MRT variables in a panel data method can help to solve part of the endogeneity issue related to the omitted variable bias. Another major difficulty in estimating the gravity equation is the presence of zero bilateral trade, which makes the usual Ordinary Least Squares (OLS) techniques inappropriate for both cross-sectional and panel data. Several techniques are used to overcome this difficulty. The first solution proposed in the literature consists of increasing the values of exports of a relatively low value and estimating the model using the usual techniques (Rose et al., 2000; Bangake and Eggoh, 2009; Camara, 2013). Using the Pseudo-Poisson Maximum Likelihood (PPLM) estimator is an adequate solution. This approach can be extended to trade levels, thereby explicitly calculating the non-linear shape of the gravity model and preventing zero trade from falling. A seminal article by Santos Silva and Tenreyro (2006) emphasizes that the PPLM is a stable strategy in the case of heteroskedasticity. However, a limitation of the PPLM method is related to the lack of convergence of the estimation algorithm as the number of explanatory variables increases. Using a Tobit regression to control the censoring of the transformed variable (Avom and Gbetnkom, 2005; Afesorgbor, 2012) is also well known in the literature. For these reasons, our methodological choice involves estimating Model (3) using panel techniques (fixed or random effects) and Tobit regression as robustness test. A Hausman test is used to determine the appropriate specific effect.

4.3. Data

The study covers all the 15 ECOWAS countries: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. The sample period is from 1996 to 2018, due to data availability. The data used come from several databases. Real GDP in US dollars (base year 2010) and population come from the World Bank's World Development Indicators (WDI 2019) database. Data on bilateral trade in goods (imports) are from the International Monetary Fund (IMF) Direction of Trade Statistics; they are in current US dollars. Data on the quality of institutions come from the World Bank's WGIs database (WGI 2019). Exchange rate data are drawn from the International Financial Statistics (IFS 2019) database of the IMF. The other data of the gravity model come from the Centre d'Etudes Prospectives et d'Informations Internationales. Detailed descriptions of the variables of the study are presented in Table A2.

Since the sample covers 15 ECOWAS countries, we have 210 pairs of countries observed over 23 years, for a total of 4830 observations. Descriptive statistics for all variables of the study are presented in Table A3. Even if the time series component ($T = 23$) is less than the cross-section component ($N = 210$), we explore the time series properties of the variables of the study. Therefore, we perform the stationarity test of Maddala and Wu (1999) on our panel data. The results are presented in Table A4. They show that most of the variables are stationary in level. GDP series (exporter and importer) and some institutional quality variables are first-order integrated. These results could suggest the use of the Fully Modified OLS (FMOLS) estimator or the Dynamic OLS (DOLS). However, Fidrmuc (2009) shows that the basic features of gravity models (the sign and absolute value range) are very robust to the estimation method. His results for various estimation methods [Fixed Effects (FE), Random Effects (RE) model] show that OLS, FMOLS, and DOLS yield largely similar results. Therefore, the possible bias of studies based on traditional estimation methods due to the non-stationarity of gravity models is negligible.

5. RESULTS AND DISCUSSION

This section presents the results of the implementation of the methodology presented above and discusses the main results.

5.1. Results

The results of the gravity model estimate [Equation (3)] are presented in Table 2. Two specifications are tested: one in which institutional qualities in both countries are combined into a single IQ_{ijt} index, and a second in which the indices of both (QI'_{it} and QI'_{jt}) countries are included separately in the same equation. In both specifications, the indices were expressed in logs. The Hausman test failed to reject the hypothesis of random effects (prob > chi^2 = 0.3570). The results of the estimates from the random-effect panel model are presented in columns [1] and [2], while those from the Tobit regression are presented in columns [3] and [4]. The analysis of the results shows the significance of several variables with the expected signs in relation to the existing literature. The coefficient of our variable of interest (quality of institutions) is significantly positive at 5% with the panel random effect estimation. The quality of institutions, therefore, has a positive influence on trade flows between West African countries. Countries with relatively better performing institutions tend to trade more among themselves, all other things being equal. In the second specification, however, the coefficients of the quality of the institutions are positive, but only that of the exporting country is significant at 5%, suggesting that it is apparently the institutional quality of the exporter that really matters.

The coefficients of the distance variable and sharing a common border are significantly negative and positive, respectively, in all regressions at 1%. Bilateral trade in West Africa thus decreases with the distance between partners and increases when the partner-countries share a common border, as predicted by the gravity equation. This result implies that countries that are geographically far away bear higher transport costs that inhibit trade. The landlocked nature of at least one country in the pair is a factor that negatively affects trade. The coefficient of this variable is significant at the 5% level (Table 2).

Furthermore, the results show that the size of the market, as measured by the GDP and population of partner countries, is a significant factor in the development of trade in ECOWAS. The consolidation of regional integration in the WAEMU zone through the introduction of the CET in 2000 produced a positive effect, whereas the introduction of the ECOWAS CET in 2015 has not yet produced the expected effects. Exchange rate volatility has a negative and significant coefficient in all regressions. Moreover, membership in a monetary union seems to be a determining factor in intra-zone trade. These results suggest that further integration in the ECOWAS zone through the adoption of a common currency for the zone will significantly increase trade by reducing transaction costs and eliminating uncertainty related to exchange rate volatility. These results are consistent with those of Diop (2007) and Bangake and Eggoh (2009), who find, using panel techniques (fixed effects and random effects), a positive and significant impact of the CFA franc on intra-WAEMU trade.

Table 2 | Institutional quality and bilateral trade in West Africa (1996–2018)

Variables	Panel random effect		Tobit regression	
	[1]	[2]	[3]	[4]
Exporter's GDP	0.819** (0.032)	0.782** (0.041)	1.292** (0.013)	1.097** (0.038)
Importer's GDP	0.115 (0.761)	0.153 (0.687)	0.240 (0.634)	0.359 (0.477)
Exporter's population	1.124** (0.022)	1.171** (0.017)	1.406** (0.048)	1.676** (0.020)
Importer's population	1.457*** (0.003)	1.410*** (0.004)	2.012*** (0.003)	1.886*** (0.006)
Exchange rate	−0.000 (0.129)	−0.000 (0.127)	−0.000 (0.514)	−0.000 (0.508)
Exchange rate volatility	−4.151*** (0.005)	−4.150*** (0.005)	−5.648*** (0.003)	−5.751*** (0.002)
Distance	−1.878*** (0.000)	−1.878*** (0.000)	−2.223*** (0.002)	−2.221*** (0.002)
WAEMU CET	1.344*** (0.000)	1.343*** (0.000)	0.672*** (0.001)	0.669*** (0.001)
ECOWAS CET	0.987** (0.011)	0.986** (0.011)	0.463 (0.132)	0.457 (0.137)
Common currency	3.330*** (0.000)	3.330*** (0.000)	4.497*** (0.000)	4.513*** (0.000)
Landlockedness	−2.438*** (0.000)	−2.438*** (0.000)	−3.416*** (0.000)	−3.477*** (0.000)
Contiguity	2.270*** (0.004)	2.270*** (0.004)	2.371** (0.044)	2.366** (0.044)
Common official language	1.299 (0.166)	1.298 (0.165)	1.397 (0.314)	1.389 (0.316)
Common ethnic language	0.167 (0.850)	0.167 (0.849)	0.391 (0.765)	0.364 (0.780)
Exporter's remoteness	−0.002 (0.222)	−0.002 (0.193)	−0.003 (0.142)	−0.003 (0.123)
Importer's remoteness	0.000 (0.786)	0.001 (0.726)	0.000 (0.844)	0.001 (0.736)
Quality of institutions	0.635** (0.025)	–	1.369*** (0.001)	–
Exporter quality of institutions	–	0.970** (0.011)	–	2.444*** (0.000)
Importer quality of institutions	–	0.302 (0.429)	–	0.469 (0.365)
Observations	4692	4692	4692	4692
Hausman test prob.	0.3570	–	–	–
Country-pair effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Source: Author's estimates. *p*-values are in parentheses. ***, **, denote significance at 1%, 5%, respectively.

To reinforce the validity of our results, we test the robustness of our results using an alternative estimation method. We first re-estimate our basic model [Equation (3)] using Tobit regression. The results of these estimates are also presented in Table 2, in columns [3] and [4]. They are qualitatively similar to those obtained with the panel random effect estimator. However, the positive and significant effect of the quality of the institutions seems more important with this methodological approach. We also use the sub-indices of institutional quality (political stability, rule of law, efficiency of public administration, quality of regulation, citizen voice accountancy and control of corruption) in the gravity equation to test the homogeneity of the direction of their effects on intra-zone trade flows. The results of the estimates are presented in Table 3. They show that the components of institutional quality have heterogeneous influences on bilateral trade in West Africa. However, the coefficient relating to the political stability of the partner countries is significant at 1%. This result shows that, in ECOWAS, political stability is a prerequisite for the development of trade. Politically stable countries tend to trade more than politically unstable countries. These results are confirmed by the Tobit regressions presented in Table A5. The coefficients associated with the other dimensions of the institutional quality are not statistically significant.

Finally, we examine the relationship between the similarity in the quality of partner countries' institutions and the level of their bilateral exports. For this purpose, in the gravity model [Equation (3)], we use the similarity of the quality of institutions instead of their scores. The similarity of the quality of institutions was computed according to the Equation (1) in Section 3. The results of the estimates with the panel random effect estimator are presented in Table 4. They suggest once again a positive and significant effect at 5% of the similarity of the quality of institutions on trade, as shown in column [1]. By re-estimating the model on the similarity of the different components of institutional quality, it appears that the political stability coefficient (1.486) is significant at 1%. However, the coefficient of the citizen's voice accountancy is negative at the 10% level of significance. Controlling for the robustness of these results by Tobit regression, it appears that only the effects of institutional quality similarity and political stability are robust, as seen in Table A6. The various tests performed corroborate the results of the first estimates. Specifically, they conclude the robustness of a positive relationship between trade flows and institutional quality in West Africa.

5.2. Discussion

The results of our estimates show a positive and significant relationship between the quality and similarity of the partner countries' institutional quality. They also show the decisive role of the institutions of the exporting country. Considering the different dimensions of institutional quality, political stability is the most significant dimension. Our results are in line with those obtained by Anderson and Marcouiller (2002), De Sousa and Disdier (2006), and Lavallée (2006), who found a positive relationship between trade and institutional quality. They confirm the results of recent work by Berden et al. (2013) and Martínez-Zarzoso and Márquez-Ramos (2018).

Table 3 | Institutional quality components and bilateral trade in West Africa (1996–2018)

Variables	Panel random effect					
	[1]	[2]	[3]	[4]	[5]	[6]
Exporter's GDP	0.831** (0.020)	1.149*** (0.002)	0.839** (0.020)	0.784** (0.027)	0.883** (0.013)	0.807** (0.025)
Importer's GDP	0.452 (0.202)	0.450 (0.210)	0.452 (0.206)	0.404 (0.252)	0.496 (0.158)	0.441 (0.217)
Exporter's population	1.319*** (0.006)	0.936* (0.054)	1.310*** (0.006)	1.379*** (0.004)	1.373*** (0.004)	1.383*** (0.004)
Importer's population	1.273*** (0.008)	1.265*** (0.009)	1.271*** (0.007)	1.334*** (0.005)	1.339*** (0.005)	1.325*** (0.006)
Exchange rate	−0.000* (0.056)	−0.000 (0.109)	−0.000* (0.062)	−0.000* (0.059)	−0.000* (0.087)	−0.000** (0.047)
Exchange rate volatility	−5.214*** (0.000)	−4.832*** (0.000)	−5.175*** (0.000)	−4.971*** (0.000)	−3.119** (0.028)	−5.371*** (0.000)
Distance	−1.926*** (0.000)	−1.918*** (0.000)	−1.931*** (0.000)	−1.921*** (0.000)	−1.908*** (0.000)	−1.940*** (0.000)
WAEMU CET	0.477*** (0.002)	0.560*** (0.000)	0.493*** (0.002)	0.508*** (0.001)	0.518*** (0.001)	0.523*** (0.001)
ECOWAS CET	0.402* (0.076)	0.431* (0.059)	0.399* (0.083)	0.390* (0.085)	0.351 (0.121)	0.474** (0.046)
Common currency	3.355*** (0.000)	3.398*** (0.000)	3.374*** (0.000)	3.389*** (0.000)	3.398*** (0.000)	3.379*** (0.000)
Landlockedness	−2.365*** (0.000)	−2.271*** (0.000)	−2.385*** (0.000)	−2.489*** (0.000)	−2.490*** (0.000)	−2.398*** (0.000)
Contiguity	2.135*** (0.008)	2.138*** (0.008)	2.124*** (0.007)	2.131*** (0.008)	2.129*** (0.009)	2.104** (0.012)
Common official language	1.268 (0.183)	1.200 (0.206)	1.250 (0.178)	1.225 (0.197)	1.237 (0.197)	1.291 (0.193)
Common ethnic language	0.049 (0.956)	0.174 (0.845)	0.064 (0.942)	0.054 (0.951)	0.021 (0.981)	−0.044 (0.963)
Exporter's remoteness	−0.001 (0.583)	−0.002 (0.266)	−0.001 (0.513)	−0.001 (0.470)	−0.001 (0.432)	−0.001 (0.648)
Importer's remoteness	0.001 (0.672)	0.001 (0.719)	0.001 (0.726)	0.000 (0.803)	0.000 (0.843)	0.001 (0.638)
Corruption	−0.208 (0.515)	–	–	–	–	–
Government effectiveness	–	−0.059 (0.834)	–	–	–	–
Quality of regulation	–	–	−0.032 (0.913)	–	–	–
Compliance with rule of law	–	–	–	0.267 (0.244)	–	–
Political stability	–	–	–	–	0.470*** (0.000)	–
Voice accountancy	–	–	–	–	–	−0.262 (0.258)
Observations	4718	4692	4718	4718	4718	4718
Number of pairs	210	210	210	210	210	210
Country-pair effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2_Between	0.571	0.578	0.575	0.581	0.588	0.573

Source: Author's estimates. *p*-values are in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Table 4 | Similarity of institutional quality effect on bilateral trade in West Africa (1996–2018)

Variables	Panel random effect						
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Exporter's GDP	0.826** (0.021)	0.762** (0.033)	0.770** (0.032)	0.754** (0.036)	0.762** (0.034)	0.908** (0.010)	0.801** (0.026)
Importer's GDP	0.463 (0.194)	0.392 (0.269)	0.404 (0.255)	0.390 (0.272)	0.395 (0.267)	0.528 (0.133)	0.430 (0.227)
Exporter's population	1.307*** (0.007)	1.432*** (0.003)	1.405*** (0.004)	1.422*** (0.003)	1.427*** (0.003)	1.245*** (0.009)	1.397*** (0.004)
Importer's population	1.245*** (0.010)	1.378*** (0.004)	1.347*** (0.005)	1.360*** (0.005)	1.370*** (0.005)	1.202** (0.011)	1.346*** (0.005)
Exchange rate	−0.000** (0.040)	−0.000* (0.051)	−0.000** (0.048)	−0.000** (0.042)	−0.000** (0.049)	−0.000* (0.065)	−0.000* (0.061)
Exchange rate volatility	−4.567*** (0.001)	−5.213*** (0.000)	−5.071*** (0.000)	−4.987*** (0.000)	−5.174*** (0.000)	−3.316** (0.018)	−5.391*** (0.000)
Distance	−1.940*** (0.000)	−1.929*** (0.000)	−1.935*** (0.000)	−1.931*** (0.000)	−1.931*** (0.000)	−1.966*** (0.000)	−1.925*** (0.000)
WAEMU CET	0.509*** (0.001)	0.488*** (0.002)	0.495*** (0.001)	0.502*** (0.001)	0.493*** (0.001)	0.487*** (0.001)	0.497*** (0.001)
ECOWAS CET	0.367 (0.108)	0.393* (0.085)	0.403* (0.077)	0.395* (0.083)	0.401* (0.081)	0.298 (0.189)	0.431* (0.060)
Common currency	3.365*** (0.000)	3.383*** (0.000)	3.386*** (0.000)	3.373*** (0.000)	3.385*** (0.000)	3.319*** (0.000)	3.396*** (0.000)
Landlockedness	−2.421*** (0.000)	−2.448*** (0.000)	−2.457*** (0.000)	−2.465*** (0.000)	−2.452*** (0.000)	−2.364*** (0.000)	−2.409*** (0.000)
Contiguity	2.113** (0.011)	2.111** (0.011)	2.100** (0.012)	2.100** (0.012)	2.113** (0.011)	2.051** (0.011)	2.088** (0.013)
Common official language	1.273 (0.197)	1.256 (0.200)	1.256 (0.205)	1.253 (0.205)	1.255 (0.204)	1.387 (0.147)	1.196 (0.228)
Common ethnic language	0.049 (0.958)	0.021 (0.982)	0.019 (0.984)	0.018 (0.985)	0.013 (0.989)	−0.025 (0.978)	0.054 (0.954)
Exporter's remoteness	−0.001 (0.586)	−0.001 (0.569)	−0.001 (0.604)	−0.001 (0.591)	−0.001 (0.606)	−0.001 (0.526)	−0.001 (0.535)
Importer's remoteness	0.001 (0.703)	0.001 (0.711)	0.001 (0.683)	0.001 (0.699)	0.001 (0.677)	0.001 (0.733)	0.000 (0.753)
Similarity of institutional quality	1.060** (0.023)	–	–	–	–	–	–
Similarity of corruption	–	−0.390 (0.450)	–	–	–	–	–
Similarity of government effectiveness	–	–	0.337 (0.468)	–	–	–	–
Similarity of quality of regulation	–	–	–	0.444 (0.364)	–	–	–
Similarity of rule of law	–	–	–	–	−0.040 (0.928)	–	–
Similarity of political stability	–	–	–	–	–	1.486*** (0.000)	–
Similarity of voice accountancy	–	–	–	–	–	–	−0.822* (0.053)
Observations	4718	4718	4718	4718	4718	4718	4718
Number of pairs	210	210	210	210	210	210	210
Country-pair effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2_between	0.576	0.573	0.574	0.574	0.573	0.587	0.575

Source: Author's estimates. *p*-values are in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

However, they are in contradiction with those of Doukouré (2011), who finds, based on the estimation of a gravity model by the Tobit type II estimator, that the poor quality of WAEMU institutions does not constitute an obstacle to export value growth. According to his results, the more the political and institutional environment deteriorates, the more exports increase. Specifically, corruption encourages WAEMU exports (Doukouré, 2011). He concludes that the large-scale exploitation and export of natural resources and raw materials is accompanied by an increasing degradation of WAEMU countries' institutions. The results of Doukouré (2011), however, suffer from the problem of the omitted variable (Baldwin, 2005) insofar as several non-negligible determinants—such as the language community, the bilateral real exchange rate, bilateral exchange rate volatility, and the quality of infrastructure—are not taken into account in the gravity model. Moreover, the quality of the institutions was captured by only three dimensions, namely, control of corruption, compliance with the rule of law, and government effectiveness. Our estimates of West African countries from 1996 to 2018 do not support the second-best theories supported by Leff (1964) and Huntington (1968), which present corruption as a way to improve trade. Indeed, the coefficient of the variable 'control of corruption' is negative, but not significant in most of the regressions. Our results suggest that the quality of institutions is an important factor that firms involved in regional trade operations take into account when choosing the destination of their exports or the origin of their imports. Politically stable countries with effective governance and a level of corruption under control are more willing to trade with each other, as transaction costs and the risk of not unwinding transactions (embezzlement and political risk) are minimized. Strong institutions thus offer a competitive advantage in the countries that have them.

Does the quality of institutions enhance the intensification of trade in West Africa? Does institutional weakness explain the low level of intra-ECOWAS trade? The results of our estimates clearly show that the quality of institutions has a positive influence on partner countries' trade in West Africa. In addition to the poorly diversified structure of ECOWAS economies and the various supply-side constraints, the low level of trade integration in West Africa is also linked to the poor quality of the countries' institutions. It is worth recalling that Table 1 shows that the average of the institutional quality indicator, as well as that of its components at the regional level, is less than 50%. Indeed, poor governance, political instability, corruption, the ineffective application of community texts, informal non-tariff barriers, the inconsistency or mismanagement of national and/or regional trade policies (Agbodji, 2007), and the time needed for administrative procedures relating to import or export operations are all aspects of the poor quality of institutions that hinder the harmonious development of trade through the uncertainty and additional transaction costs they generate at the level of exporting companies. The results highlight

an important lever: the quality of institutions, on which economic policy and decision-makers can build to instill new dynamism into intra-zone trade and raise the level of regional integration in West Africa. They also demonstrate the urgency of institutional reforms at the national and regional levels, in order to send a positive signal to enterprises engaged in sub-regional trade.

6. CONCLUSION

West African countries aspire to deeper regional integration that can accelerate their structural transformation through economies of scale, improving competitiveness and promoting regional value chains. However, despite efforts undertaken at the regional level (free trade agreements on the circulation of goods and persons and the implementation of the CET in WAEMU in 2000 and in ECOWAS in 2015) to raise the level of trade in West Africa, trade intensity in the region remains low. The reasons generally cited in the literature include low economic diversification, supply-side constraints, inadequate national and sub-regional policies, and poor-quality transport infrastructure. Without calling into question these reasons, this study investigated the contribution of the quality of institutions to the current state of trade in ECOWAS. The aim of this research was therefore to analyze empirically the relationship between the quality of institutions and intra-community trade in West Africa. The study employed an augmented gravity model to highlight the determinants of intra-ECOWAS trade and isolate the marginal effect of institutional quality and similarity of trading partners. The results suggest a positive, significant, and robust effect of institutional quality on trade in West Africa.

What are the implications of this research for the conduct of regional policies in West Africa? First, the study showed that the quality of institutions matters. It cannot be neglected in the design of regional policies. It will therefore take more than trade liberalization to deepen trade integration in West Africa. The poor quality of institutions in ECOWAS countries was found to be harmful to the development of trade between its member countries. The estimates showed that within the different dimensions of institutional quality, political stability is the most significant for positively influencing bilateral exports in ECOWAS. The need to undertake institutional reforms at national and sub-regional levels is thus established.

CONFLICTS OF INTEREST

The author declares no conflicts of interest.

AUTHOR CONTRIBUTION

The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

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Not applicable, because this article does not contain any studies with human or animal subjects.

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APPENDIX

Table A1 | Matrix of bilateral exports in 2018 as a percentage of total intra-zone exports

i / *j*	BEN	BFA	CPV	CIV	GMB	GHA	GIN	GNB	LBR	MLI	NER	NGA	SEN	SLE	TGO
BEN	–	0.10	0.00	0.09	0.00	0.01	0.00	0.00	0.00	0.03	0.25	0.68	0.01	0.00	0.08
BFA	0.02	–	0.00	1.85	0.00	0.87	0.05	0.00	0.01	0.15	0.15	0.00	0.09	0.00	0.55
CPV	0.00	0.00	–	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CIV	0.52	**5.54**	0.00	–	0.13	**3.18**	0.52	0.01	0.20	**5.14**	0.88	1.80	1.06	0.05	1.03
GMB	0.00	0.00	0.00	0.00	–	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
GHA	0.30	2.46	0.01	0.50	0.02	–	0.06	0.00	0.14	0.51	0.52	0.73	0.41	0.04	1.26
GIN	0.02	0.02	0.00	0.01	0.00	2.76	–	0.00	0.03	0.13	0.01	0.00	0.15	0.06	0.00
GNB	0.00	0.00	0.00	0.03	0.00	0.03	0.00	–	0.03	0.00	0.00	0.00	0.00	0.00	0.00
LBR	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	–	0.00	0.00	0.01	0.01	0.07	0.00
MLI	0.01	0.05	0.00	0.35	0.00	0.02	0.06	0.00	0.00	–	0.03	0.00	0.15	0.00	0.04
NER	0.14	0.35	0.00	0.02	0.00	0.21	0.00	0.00	0.00	0.76	–	1.04	0.01	0.00	0.00
NGA	0.42	0.00	0.00	18.61	0.00	11.69	0.01	0.00	0.00	0.09	0.02	–	**8.84**	0.00	0.04
SEN	0.16	0.60	0.03	1.16	0.65	0.21	0.85	0.31	0.07	**3.10**	0.25	0.27	–	0.10	0.19
SLE	0.01	0.00	0.00	0.13	0.01	0.09	0.01	0.00	0.12	0.00	0.00	0.00	0.02	–	0.00
TGO	1.69	**3.26**	0.00	1.15	0.03	1.63	0.11	0.00	0.05	1.04	1.55	2.52	0.17	0.01	–

Source: Author. BEN, Benin; BFA, Burkina Faso; CPV, Cape Verde; CIV, Cote d'Ivoire; GMB, Gambia; GHA, Ghana; GIN, Guinea; GNB, Guinea-Bissau; LBR, Liberia; MLI, Mali; NER, Niger; NGA, Nigeria; SEN, Senegal; SLE, Sierra Leone; TGO, Togo.

Table A2 | Data sources

Bilateral exports of goods and services in current USD	Direction of Trade Statistics (DOTS), IMF 2019
A dummy set to 1 if the two countries in the pair are contiguous	From Centre d'Etudes Prospectives et d'Informations
Area (country's area in km²)	Internationales (CEPII) website, http://www.cepii.
Distance is calculated following the great circle formula, which uses latitudes and longitudes of the most important cities/agglomerations (in terms of population)	fr/francgraph/bdd/distances.htm
Landlocked: dummy variable set to 1 for landlocked countries	
A dummy set to 1 if the two countries in the pair share a language spoken by at least 9% of the population in both countries	
A dummy set to one if the countries within the pair have a common official language	
Population	World Development Indicators (WDI) 2019
GDP in constant 2010 USD	
Voice and accountability	Worldwide Governance Indicators (WGI, 2019)
Political stability and absence of violence	
Government effectiveness	
Regulatory quality	
Rule of law	
Control of corruption	
Nominal exchange rate	International Financial Statistics (IFS, 2019)
WAEMU Common External Tariff (CET) dummy	Author's computation
ECOWAS Common External Tariff (CET) dummy	
Common currency dummy	

Source: Author.

Table A3 | Descriptive statistics of the main variables of the study

Variables	Obs	Mean	Std. Dev.	Min	Max
Bilateral exports	4.830	3.39E+07	1.61E+08	0.00E+00	4.59E+09
Exporter's GDP	4.774	2.85E+10	8.04E+10	5.36E+08	4.69E+11
Importer's GDP	4.774	2.85E+10	8.04E+10	5.36E+08	4.69E+11
Exporter's population	4.830	1.90E+07	3.60E+07	3.96E+05	1.96E+08
Importer's population	4.830	1.90E+07	3.60E+07	3.96E+05	1.96E+08
Exchange rate	4.830	72.32	429.37	0.00	6781.91
Exchange rate volatility	4.830	4.91	39.09	0.00	1336.66
Distance	4.830	1299.58	723.77	105.18	3092.47
WAEMU CET dummy	4.830	0.65	0.48	0.00	1.00
ECOWAS CET dummy	4.830	0.17	0.38	0.00	1.00
Common currency dummy	4.830	0.27	0.44	0.00	1.00
Landlockedness dummy	4.830	0.37	0.48	0.00	1.00
Contiguity dummy	4.830	0.24	0.43	0.00	1.00
Common official language dummy	4.830	0.37	0.48	0.00	1.00
Common ethnic language dummy	4.830	0.34	0.47	0.00	1.00
Exporter's remoteness	4.830	1286.65	252.39	0.00	1950.97
Importer's remoteness	4.830	1286.65	252.39	0.00	1950.97
Quality of institutions	4.802	7.20	0.38	5.83	8.07
Exporter quality of institutions	4.816	3.60	0.28	2.63	4.14
Importer quality of institutions	4.816	3.60	0.28	2.63	4.14
Corruption	4.830	7.18	0.37	6.02	8.24
Government effectiveness	4.802	6.99	0.40	5.61	8.01
Quality of regulation	4.830	7.19	0.36	5.47	7.90
Compliance with rule of law	4.830	7.09	0.48	5.07	8.19
Political stability	4.830	7.09	0.85	2.97	8.52
Voice accountancy	4.830	7.40	0.43	5.93	8.37
Similarity of institutional quality	4.774	0.75	0.16	0.25	1.00
Similarity of corruption	4.774	0.75	0.16	0.27	1.00
Similarity of government effectiveness	4.830	0.74	0.16	0.23	1.00
Similarity of quality of regulation	4.830	0.78	0.16	0.22	1.00
Similarity of rule of law	4.830	0.71	0.18	0.16	1.00
Similarity of political stability	4.830	0.61	0.26	0.03	1.00
Similarity of voice accountancy	4.830	0.73	0.16	0.29	1.00

Source: Author.

Table A4 | Panel unit root test of Maddala and Wu (1999)

Variables	Level			First difference		
	Chi² Stat.	Prob > Chi²	Conclusion	Chi² Stat.	Prob > Chi²	Conclusion
Bilateral exports	1300.04	0.0000	I(0)	–	–	–
Exporter's GDP	221.36	1.0000	–	3301.77	0.0000	I(1)
Importer's GDP	221.36	1.0000	–	3301.77	0.0000	I(1)
Exporter's population	3364.46	0.0000	I(0)	–	–	–
Importer's population	3364.46	0.0000	I(0)	–	–	–
Exchange rate	472.24	0.0396	I(0)	–	–	–
Exchange rate volatility	1976.13	0.0000	I(0)	–	–	–
Quality of institutions	388.16	0.8653	–	2495.98	0.0000	I(1)
Exporter quality of institutions	407.03	0.6661	–	2720.65	0.0000	I(1)
Importer quality of institutions	407.03	0.6661	–	2720.65	0.0000	I(1)
Corruption	384.88	0.8895	–	3112.38	0.0000	I(1)
Government effectiveness	738.79	0.0000	I(0)	–	–	–
Quality of regulation	760.46	0.0000	I(0)	–	–	–
Compliance with rule of law	446.38	0.1801	–	2928.90	0.0000	I(1)
Political stability	756.27	0.0000	I(0)	–	–	–
Voice accountancy	630.12	0.0000	I(0)	–	–	–
Similarity of institutional quality	1446.37	0.0000	I(0)	–	–	–
Similarity of corruption	540.79	0.0001	I(0)	–	–	–
Similarity of government effectiveness	1471.07	0.0000	I(0)	–	–	–
Similarity of quality of regulation	880.43	0.0000	I(0)	–	–	–
Similarity of rule of law	424.62	0.4278	–	3168.78	0.0000	I(1)
Similarity of political stability	514.53	0.0011	I(0)	–	–	–
Similarity of voice accountancy	662.09	0.0000	I(0)	–	–	–

Source: Author.

Table A5 | Institutional quality components and bilateral trade in West Africa, Tobit regression

Variables	Tobit regression					
	[1]	[2]	[3]	[4]	[5]	[6]
Exporter's GDP	1.021** (0.049)	1.490*** (0.004)	0.853 (0.104)	0.908* (0.078)	1.090** (0.033)	1.047** (0.044)
Importer's GDP	0.475 (0.342)	0.390 (0.439)	0.321 (0.526)	0.403 (0.416)	0.594 (0.229)	0.500 (0.318)
Exporter's population	1.677** (0.018)	1.109 (0.120)	1.862*** (0.009)	1.821*** (0.010)	1.791*** (0.010)	1.656** (0.019)
Importer's population	1.686** (0.014)	1.773** (0.010)	1.852*** (0.007)	1.780*** (0.009)	1.741** (0.010)	1.666** (0.015)
Exchange rate	−0.000 (0.279)	−0.000 (0.445)	−0.000 (0.285)	−0.000 (0.302)	−0.000 (0.466)	−0.000 (0.277)
Exchange rate volatility	−7.140*** (0.000)	−6.676*** (0.000)	−6.839*** (0.000)	−6.790*** (0.000)	−4.271** (0.026)	−7.236*** (0.000)
Distance	−2.262*** (0.002)	−2.251*** (0.002)	−2.257*** (0.002)	−2.241*** (0.002)	−2.226*** (0.002)	−2.271*** (0.002)
WAEMU CET	0.509** (0.017)	0.617*** (0.004)	0.585*** (0.006)	0.549*** (0.009)	0.591*** (0.005)	0.538** (0.011)
ECOWAS CET	0.450 (0.147)	0.507 (0.104)	0.543* (0.087)	0.421 (0.174)	0.405 (0.190)	0.501 (0.121)
Common currency	4.416*** (0.000)	4.451*** (0.000)	4.392*** (0.000)	4.460*** (0.000)	4.463*** (0.000)	4.423*** (0.000)
Landlockedness	−3.228*** (0.001)	−3.090*** (0.001)	−3.428*** (0.000)	−3.463*** (0.000)	−3.378*** (0.000)	−3.209*** (0.001)
Contiguity	2.388** (0.047)	2.375** (0.046)	2.377** (0.045)	2.403** (0.042)	2.386** (0.043)	2.376** (0.047)
Common official language	1.579 (0.265)	1.485 (0.291)	1.584 (0.258)	1.499 (0.284)	1.536 (0.270)	1.595 (0.260)
Common ethnic language	0.245 (0.854)	0.405 (0.760)	0.172 (0.896)	0.252 (0.848)	0.200 (0.879)	0.208 (0.876)
Exporter's remoteness	−0.002 (0.477)	−0.003 (0.183)	−0.002 (0.461)	−0.002 (0.373)	−0.002 (0.385)	−0.002 (0.477)
Importer's remoteness	0.001 (0.711)	0.001 (0.712)	0.001 (0.735)	0.000 (0.875)	0.000 (0.864)	0.001 (0.708)
Corruption	−0.103 (0.819)	–	–	–	–	–
Government effectiveness	–	0.157 (0.685)	–	–	–	–
Quality of regulation	–	–	0.588 (0.165)	–	–	–
Compliance with rule of law	–	–	–	0.679** (0.040)	–	–
Political stability	–	–	–	–	0.735*** (0.000)	–
Voice accountancy	–	–	–	–	–	−0.181 (0.572)
Observations	4718	4692	4718	4718	4718	4718
Number of pairs	210	210	210	210	210	210
Country-pair effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author's estimates. *p*-values are in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Table A6 | Similarity of institutional quality effect on bilateral trade in West Africa, Tobit regression

Variables	Tobit regression						
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Exporter's GDP	1.097** (0.033)	1.002* (0.052)	1.013** (0.049)	0.961* (0.062)	1.022** (0.047)	1.145** (0.025)	1.056** (0.040)
Importer's GDP	0.564 (0.257)	0.450 (0.365)	0.475 (0.339)	0.444 (0.371)	0.493 (0.322)	0.625 (0.206)	0.508 (0.307)
Exporter's population	1.527** (0.030)	1.719** (0.015)	1.678** (0.017)	1.725** (0.014)	1.643** (0.020)	1.555** (0.026)	1.660** (0.018)
Importer's population	1.516** (0.026)	1.735** (0.011)	1.677** (0.014)	1.694** (0.013)	1.631** (0.017)	1.532** (0.023)	1.671** (0.014)
Exchange rate	−0.000 (0.230)	−0.000 (0.288)	−0.000 (0.277)	−0.000 (0.214)	−0.000 (0.249)	−0.000 (0.355)	−0.000 (0.323)
Exchange rate volatility	−6.161*** (0.001)	−7.185*** (0.000)	−7.003*** (0.000)	−6.634*** (0.000)	−6.944*** (0.000)	−4.783** (0.012)	−7.316*** (0.000)
Distance	−2.283*** (0.001)	−2.262*** (0.002)	−2.271*** (0.002)	−2.266*** (0.002)	−2.261*** (0.002)	−2.316*** (0.001)	−2.258*** (0.002)
WAEMU CET	0.554*** (0.008)	0.510** (0.015)	0.520** (0.013)	0.544*** (0.009)	0.508** (0.015)	0.543*** (0.009)	0.518** (0.013)
ECOWAS CET	0.393 (0.206)	0.440 (0.157)	0.454 (0.143)	0.440 (0.156)	0.407 (0.193)	0.324 (0.294)	0.484 (0.119)
Common currency	4.394*** (0.000)	4.428*** (0.000)	4.431*** (0.000)	4.401*** (0.000)	4.402*** (0.000)	4.329*** (0.000)	4.442*** (0.000)
Landlockedness	−3.230*** (0.001)	−3.254*** (0.001)	−3.264*** (0.001)	−3.313*** (0.001)	−3.249*** (0.001)	−3.174*** (0.001)	−3.196*** (0.001)
Contiguity	2.376** (0.047)	2.376** (0.047)	2.361** (0.049)	2.334* (0.051)	2.378** (0.047)	2.281* (0.053)	2.352** (0.049)
Common official language	1.610 (0.254)	1.572 (0.267)	1.573 (0.266)	1.562 (0.268)	1.577 (0.264)	1.763 (0.205)	1.503 (0.287)
Common ethnic language	0.285 (0.830)	0.246 (0.854)	0.247 (0.852)	0.242 (0.855)	0.263 (0.843)	0.143 (0.913)	0.291 (0.826)
Exporter's remoteness	−0.002 (0.469)	−0.002 (0.442)	−0.002 (0.466)	−0.002 (0.454)	−0.002 (0.462)	−0.002 (0.459)	−0.002 (0.415)
Importer's remoteness	0.001 (0.729)	0.001 (0.749)	0.001 (0.727)	0.001 (0.764)	0.001 (0.739)	0.001 (0.749)	0.001 (0.787)
Similarity of institutional quality	2.076*** (0.001)	–	–	–	–	–	–
Similarity of corruption	–	−0.546 (0.441)	–	–	–	–	–
Similarity of government effectiveness	–	–	0.501 (0.429)	–	–	–	–
Similarity of quality of regulation	–	–	–	1.459** (0.033)	–	–	–
Similarity of rule of law	–	–	–	–	0.707 (0.250)	–	–
Similarity of political stability	–	–	–	–	–	2.179*** (0.000)	–
Similarity of voice accountancy	–	–	–	–	–	–	−0.931 (0.111)
Observations	4718	4718	4718	4718	4718	4718	4718
Number of pairs	210	210	210	210	210	210	210
Country-pair effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Author's estimates. *p*-values are in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.