

Does regional trade promote economic growth? Evidence from Economic Community of West African States (ECOWAS)

Economic
growth by
regional trade

131

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Abstract

Purpose – This paper examines the impact of regional and non-regional trade on economic growth using annual data from Economic Community of West African States (ECOWAS) member countries for the period 2007 to 2017.

Design/methodology/approach – Trade data were decomposed into regional (trade among ECOWAS Member States) and non-regional (trade between ECOWAS Member States and the rest of the world). We used the dynamic system GMM to estimate the models and introduced exchange rate, unemployment rate, population growth and gross capital formation as controlled variables.

Findings – The results revealed that the estimated coefficient of ECOWAS regional trade is statistically significant and positive in predicting growth, while the non-regional trade coefficient is negative and not statistically significant in predicting growth. Other predictors of growth introduced into the model as controlled variables, such as exchange rate, unemployment rate, population growth and gross capital formation, displayed mixed results. More importantly, population growth, unemployment and exchange rate depreciation hurt economic growth, while gross capital formation promotes economic growth.

Practical implications – The findings provide strong support in favour of the Krugman (1991) hypothesis that regional trade agreements (RTAs) are a better alternative to global trade.

Originality/value – Our decision to disaggregate ECOWAS trade is unique and influenced largely by the objective of the study, which is to establish the type of ECOWAS trade that is a good predictor of growth. The evidence from our findings support the theory that RTAs are a better catalyst to economic growth.

Keywords Regional and non-regional trade, Economic growth, ECOWAS, Dynamic panel GMM

Paper type Research paper

1. Introduction

Extant literature has relied on the Ricardian comparative advantage model, Heckscher–Ohlin model, factors of production and the production possibility curve, technology difference model and Leontief paradox, among others, in advancing the argument for gains of

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international trade (see [Sodersten and Reed, 1994](#)). The underlying assumption of these models is that countries gain from trade through improvements in economic welfare, labour quality and employment generation. In addition, countries benefit from an increase in market size and competition, ease of technology transfers and a more efficient allocation of resources. All of these ultimately lead to economic growth.

Some scholars, however, argued against international trade, insisting that it could hurt an economy, especially less-developed economies. They admitted that protectionism in certain circumstances could stimulate domestic production ([Buongiorno *et al.*, 2017](#); [Chaudhuria and Marjit, 2017](#)). Empirical evidence has also shown that there might be losers and gainers in international trade ([Pierce and Schott, 2016, 2017](#); [Autor *et al.*, 2013, 2014](#)). The emergence of China as a major trading bloc in the global economy has rekindled the debate on the gainers and losers of international trade. China and India are perceived as benefiting from international trade, while some developed and developing economies are losers ([Pierce and Schott, 2016](#)). In the US for instance, Chinese trade competition has attracted serious backlash as per the study by [Pierce and Schott \(2017\)](#); [Autor *et al.* \(2014\)](#) reveal that imports from China accounted for substantial job losses in the US between 1990 and the 2000s. Similarly, the president of the association of Brazilian capital goods producers has forcefully argued that there is a real invasion of imported products, most of them coming from China. The consequence is that they are transferring thousands of jobs abroad (Quoted in [Pavcnik, 2017](#)).

The unresolved question on who benefits from trade and mutual suspicion among countries are the two major factors promoting regional trade agreements (RTAs). To exploit the advantages of RTAs such as the reduction in the depth of borders, opportunities to reap from trade efficiency and economies of scale ([De Melo and Tsikata, 2014](#)), countries exhibit a strong preference for RTAs, which [Krugman \(1991\)](#) described as 'half a loaf' to globalization. Some classical examples are the European Union (EU), Economic and Monetary Community of Central Africa, Gulf Cooperation Council, Caribbean Single Market Economy, East African Community and Economic Community of West African States (ECOWAS). This arrangement has also raised the effectiveness of regional trade in promoting economic growth.

This study focuses on ECOWAS, the economic and monetary union of West African States, established in 1975, through the ECOWAS Treaty, to promote regional economic integration among the West African States. Article 3 of the ECOWAS Treaty highlighted promoting co-operation and integration of member countries as the overarching objective of ECOWAS. Despite the sustained efforts of member countries to promote regional trade in the sub-region through the ratification of several protocols such as the ECOWAS Common Trade Policy, ECOWAS Trade Liberalization Scheme, Free Movement of Persons, Right of Residence and Establishment, ECOWAS Common External Tariff, Convention Relating to Inter-State Road Transit of Goods, Harmonized Customs Documentation and Automated Clearance Procedures, Yamoussoukro Open Skies, Harmonization of Indirect Taxes (Value Added Tax and Excise Tax), and ECOWAS Quality Programme and Standards Harmonization, intra-ECOWAS trade has remained abysmally low.

ECOWAS Member States trade more with the rest of the world and in particularly with developed economies than with Member States. For instance, Nigeria's major trade partners are India and China, Mali's are China and the EU, Sierra Leone and Gambia's major trade partners are the EU, while Burkina Faso and Niger mostly trade with Europe, among others (see [Bloomberg Trade Flows, 2019](#) for details). Despite the low level of trade integration among ECOWAS Member States, the impact of ECOWAS regional trade on economic growth has received little attention from scholars and policy makers.

To contribute and broaden the debate, we investigate the impact of trade on economic growth, using data from ECOWAS Member States. Our decision to use ECOWAS is influenced by the paucity of empirical studies and the peculiarities of the region. For instance,

ECOWAS sub-region represents a collection of countries with primary-based economies. The countries' productive sectors are still at the embryonic stage, with large informal economies. Understanding the impact of regional trade (ECOWAS trade among member states) and non-regional trade (ECOWAS trade with the rest of the world) is the motivation for the study. The decision to decompose the trade data into regional and non-regional trade helps in establishing the net effect of each component on economic growth, which is a unique feature of this study. To achieve this objective, the rest of the paper is structured as follows: [Section 2](#) reviews the related literature, [Section 3](#) discusses the methodology; [Section 4](#) presents the results, while [Section 5](#) concludes the paper.

2. Review of related literature

2.1 Theoretical review

The trade and growth debate has gained serious attention among scholars and policy-makers because of the importance attached to trade in promoting economic growth. Theoretical studies on trade have identified channels through which international trade can promote economic development ([Wooster et al., 2008](#)). First, international trade is a vehicle through which knowledge and technological innovations are transferred among trading partners ([Edward, 1993](#)). Second, studies have demonstrated that higher trade openness increases competition in the local market, which in turn increases production efficiency and economic growth ([Beaton et al., 2017](#)). Nations with access to bigger markets through trade benefit more than countries that do not have access to larger trade markets ([Beaton et al., 2017](#)). What this implies is that small local markets benefit more from trade openness than the bigger ones, since openness to trade allows nations to capture the potential benefits of increasing returns to scale.

The overwhelming empirical evidence in support of the positive effect of trade on economic growth influenced the globalisation agenda. One of such policies is the General Agreement on Tariffs and Trade (GATT), signed in 1947 by 23 nations in Geneva for the purposes of substantially reducing tariffs and other barriers and eliminates preferences on a reciprocal and mutually advantageous basis. This represents a major global move to liberalise global trade, and it has been further strengthened with the establishment of the World Trade Organization (WTO) by 123 nations under the Uruguay Round (UR) Agreement in April 1994. However, although the GATT was jettisoned, the WTO still contains the essential ingredients of the GATT.

The difficulties associated with the implementation of the GATT and WTO influenced scholars to propose alternatives or a middle ground for globalisation. The pioneer work of [Viner \(1950\)](#) proposed RTAs, which he argued will likely be more trade creating, once they cover a large economic area and are formed between competitive rather than complementary economies. [Bergsten \(1991\)](#) disagreed with [Krugman \(1991\)](#) on the relevance of RTAs as alternatives to the GATT. [Krugman \(1991\)](#) argued that free trade zones (FTZs) or RTAs are considerably better in practice than in theory due to the demise of the GATT and the poor prospects of the UR. As such, RTAs or FTZs serve as alternatives to multilateral trade liberalization because half a loaf is better than none. [Bergsten \(1991\)](#)'s views are fundamentally different from those of [Krugman](#) because he views RTAs are considerably less desirable than [Krugman](#) suggests, especially in practice. According to [Bergsten \(1991\)](#), RTAs or FTZs should not be seen as alternatives to globalisation because the UR is quite likely to succeed.

Despite the disagreement among scholars, the theory of RTAs has become an important feature of the Multilateral Trading System, and the core objectives of RTAs and global trade liberalization have been pegged around reducing trade barriers and improving economic growth among the participating nations. The advantages of regional economic integration

among nations include reducing the depth of borders, opportunities to reap from trade efficiency and economies of scale (De Melo and Tsikata, 2014). RTAs have continued to play an increasing role in the global trading system and have regularly created measures to reduce or eliminate trade barriers (Wooster *et al.*, 2008). The surge in regional trade agreements has persisted in both developed and developing nations over the past four decades. Within the African region, over twenty regional trade agreements or blocs exist, of which many are for regional integration schemes. However, the South Africa Development Community (SADC), ECOWAS, Common Market for Eastern and Southern Africa and West Africa Economic and Monetary Union appear to be the most successful ones.

The unique objectives of RTAs are to eliminate trade barriers, promote free movement of people and goods, introduce common external tariff and integrate the payment system and capital markets of member states, with the ultimate objective of promoting regional trade integration. In spite of the emergence of RTAs, findings of empirical studies on the impact of regional trade on economic growth are mixed. Frankel and Romer (1999) for instance showed that geographical determinants are the major drivers of trade impact on economic growth. Similarly, Krugman and Lawrence (1993) examined the effect of trade integration on the US economy and particularly on wage decline and found that domestic factors rather than trade integration explain the wage decline in the US. Their position was also corroborated by the findings of Levy and Temin (2007). Levy and Temin (2007) attributed the increase in inequality in the 1980s to developments in the domestic US market, such as the large cuts in top marginal tax rates in the early 1980s, declining significance of the minimum wage after the inflation and weak organized labour. Ghoshal (2015); Zohonogo (2016) argued against RTAs, emphasizing that poor implementation of RTAs have led to tensions between countries and increased the risk of inter-state conflict. As such, economic and political adjustment in pursuing RTAs could undermine domestic livelihoods and create welfare losses. Other studies such as WTO (2011); Younes (2010a) found that the impact of RTAs on trade flows tend to be lower than often expected, because of the large number of goods subject to low duties or because of the depth of the trade agreements and the contrasting scope.

Empirical studies employ different estimation techniques. For instance, Onder and Yilmazkuday (2016) used a threshold model to analyse the effects of a country's export connections on income growth using trade partner diversification measures that captures the country's relative importance in the international trade network. Ghoshal (2015) used a linear regression technique to investigate the trade growth relationship, with particular emphasis on the RTAs. Kim *et al.* (2016) investigate the effect of trade on growth volatility using the panel data approach to account for the potential dynamic heterogeneity and cross-section dependency in the effects of trade. Similarly, Zohonogo (2016) used the panel data technique to investigate the effect of trade on economic growth in Sub-Saharan Africa. Were (2015) used the panel data technique to investigate the effect of trade on economic growth and investment in least developed economies, while Eberhard-Ruiz and Moradi (2019) used satellite imagery of lights emanating from the Earth at night. These estimation techniques employed by different scholars can be broadly classified into the threshold model (Onder and Yilmazkuday, 2016), linear regression (Ghoshal, 2015), satellite imagery of lights emanating from earth at night (Eberhard-Ruiz and Moradi, 2019) and panel technique (Zohonogo, 2016; Kim *et al.*, 2016).

The aforementioned debates increase empirical questions on regional versus global trade and which of the two has a greater impact on economic growth. To broaden this debate, we investigate the impact of trade on economic growth, using data from ECOWAS Member States. Our decision to use ECOWAS is influenced by the paucity of empirical studies on regional blocs in Africa. For instance, the ECOWAS sub-region represents a collection of countries with primary-based economies. Their productive sectors are still at their embryonic stage, with large informal economies. Understanding the impact of trade on economies with

the presence of structural rigidities in the labour markets, demographic characteristics that hinder production, lack of access to credit and economic structures and incentives that promote export forms the motivation for the study. The decision to decompose trade into internal and external trade and investigate the effect of each on economic growth is a unique feature of this study.

2.2 Empirical review

On the empirical front, scholars have used different variables and methodologies to capture the implications of trade on growth in developing and developed countries. [Lucas \(1988\)](#) and [Romer \(1986\)](#) show international trade to significantly affect economic growth in the long run. [Edward \(1992\)](#) examined the impact of international trade on economic growth using nine indices of openness and concluded that all the openness measures are positively correlated with growth. [Levine and Renelt \(1992\)](#) used cross-country regression to examine the empirical linkage between the long-run growth rate and a variety of economic policies and found that international trade indirectly affects growth through investment channels. [Vamvakidis \(1999\)](#) estimated the impact of international trade on growth from 1970 to 1990 and found trade and growth to be significantly correlated between 1970s and 1980s. [Bassanini et al. \(2001\)](#), while studying the driving forces of economic growth for OECD countries, employed panel data analysis and found that differences in investment rates, human capital, research and development, trade exposure, financial structures and macroeconomic conditions play an important role for GDP per capita patterns across countries.

Some scholars have dwelt on the contribution of trade openness to growth. [Wooster et al. \(2008\)](#) confirmed the importance of trade openness for growth. [Almeida and Fernandes \(2008\)](#) suggest that nations that are more open to free trade tend to have greater technological spillovers and therefore grow faster than nations that are less open. They also show that free trade is beneficial to growth. [Chang et al. \(2009\)](#) acknowledged a positive relationship between trade openness and economic growth. [Kim and Lin \(2009\)](#) investigated whether trade openness contributes to long-run economic growth and if the effect varies with the level of economic growth. They found that greater international trade and integration contribute to more diverging economies, and the relationship of trade with growth is through both investment and productivity growth channels. [Jouini \(2015\)](#), showed openness to trade serves as a good indicator of economic growth because it involves the movement of goods and services from one place to another. [Fenira \(2015\)](#) found that trade liberalization has weakened contributions to economic growth for 82 developing countries.

On RTAs and growth, empirical results are also mixed. Studies for developed nations such as [Henrekson et al. \(1997\)](#) show a positive relationship between regional integration and growth, while [Vanhout \(1999\)](#) notes that EU membership seems insignificant in explaining growth rates. [Wooster et al. \(2008\)](#) show that intra-regional and extra-regional trade have different impacts on growth in the 13 EU countries they studied but also added that “non-regional trade has a higher marginal effect on output growth per capita”. [Younes \(2010b\)](#) investigated the contribution of trade to growth of Arab countries and confirmed the significance of trade openness for growth. He also found that regional trade had more significant impact on growth than non-regional trade. In contrast, [Musila and Yiheyis \(2015\)](#) and [Ulasan \(2015\)](#) report a negative relationship between regional trade and economic growth.

Studies from Africa also display mixed results. On the effect of trade liberalization on economic growth, [Mwaba \(2000\)](#) examines the link for East African countries and concludes that while opening an economy to trade may not provide the desired quick fix, the removal or relaxation of quantitative import and export restrictions and lowering of tariffs would result in increased exports and growth. The dawn of a global economy ushered in by universal trade

liberalization, therefore, need not spell catastrophe for African economies, as it is widely feared. The [Economic Commission of Africa \(2011\)](#) states that trade liberalization in Eastern Africa has improved over the last two decades, which has significantly increased exports and imports through regional trade. [Onyekwena and Oloko \(2016\)](#) employed descriptive analysis to examine the prospects of regional trade for inclusive development in West Africa, by considering the nature and composition of trade in the ECOWAS region with the rest of the world. The outcome shows that economic growth within the ECOWAS region is increasing but not translating to inclusive growth because of the non-achievement of poverty reduction. They therefore argue that non-regional trade is increasing rapidly at a disproportionate rate to regional trade compared to the SADC, which signals great potential for inclusive growth in the region if parts of non-regional trade are converted to regional trade. Based on their findings, [Onyekwena and Oloko \(2016\)](#) recommended that ECOWAS Member States should revive their commitment to regional industrial policy as well as intensify investment in human capital development to ultimately achieve inclusive development in the region. This paper expands on the [Onyekwena and Oloko \(2016\)](#) paper by using the panel analytic technique.

2.3 Review of ECOWAS trade integration

ECOWAS was established on the 28 May, 1975, by fifteen member countries comprising Nigeria, Ghana, Sierra Leone, The Gambia, Liberia, Benin, Burkina Faso, Cote d' Ivoire, Guinea, Guinea-Bissau, Mali, Mauritania, Togo, Niger and Senegal, with Cape Verde joining as the sixteenth member country in 1977. The core objectives are to “eliminate trade barriers among member countries through the harmonization of custom duties and abolition of quantitative and administrative restrictions on trade among member states; elimination of obstacles to free movement of people, goods, services and capital; harmonisation of the agricultural policies and the promotion of common projects in the Member States, notably in the fields of marketing, research and agro industrial enterprises; and the implementation of schemes for the joint development of transport, communication, energy and other infrastructural facilities as well as the evolution of common policy in these fields” (Article 2 of the 1975 ECOWAS Treaty).

The overarching objective of ECOWAS is to evolve into a monetary union like the EU. The potential benefits of the monetary corporation programme include the possibilities of reaping the benefit of economies of scale in monetary management; greater efficiency and rational use and allocation of scarce human, material and financial resources; the facilitation of intra-regional trade and payment transactions. The process of actualizing monetary integration in ECOWAS, however, began in 1987, when the Heads of State and Governments adopted the ECOWAS Monetary Cooperation Programme (EMCP) to accelerate the process of monetary integration in the region. Under the programme, a single monetary zone was envisaged by 2003 for ECOWAS countries, and four primary convergence criteria were set to be met by participating countries by 1999. The EMCP made little progress by 1998, as it became clear that most ECOWAS countries might not meet the convergence criteria and were not making sustained efforts in that direction. This influenced the Heads of State and Governments of ECOWAS to adopt “a fast track/two track approach” to monetary integration in December 1999. The “two track approach” divided ECOWAS into L'Union Monétaire Ouest-Africaine (UMOA) and the West African Monetary Zone (WAMZ) to facilitate the integration process. The UMOA, generally regarded as the Francophone, is made up of eight (8) countries that have attained monetary union with common central bank and one currency. The WAMZ is made up of five (5) Anglophone countries and Guinea. The WAMZ countries were expected to achieve monetary union, and the two zones will be merged into a single currency zone by 2004 ([Fwangkwai, 2014](#)). Several postponements to the monetary integration deadline forced the

authority of Heads of State and Governments of the community to shift the launch date of monetary union to January 1, 2020, under the modified gradualist approach. The January 2020 deadline has come and gone without any clear direction on the way forward.

Though the series of postponements to the monetary union appears to derail every positive achievement from the sub-regional bloc, one important positive is the increase in intra-ECOWAS trade over the years. This is attributable to the existing ECOWAS protocols aimed at promoting regional trade. The protocols include ECOWAS Common Trade Policy; ECOWAS Trade Liberalization Scheme; Free Movement of Persons, Right of Residence and Establishment; ECOWAS Common External Tariff; Convention Relating to Inter-State Road Transit of Goods; Harmonized Customs Documentation and Automated Clearance Procedures; Yamoussoukro Open Skies; Harmonization of Indirect Taxes (Value Added Tax and Excise Tax); and ECOWAS Quality Programme and Standards Harmonization. [Figure 1](#) revealed regional trade in ECOWAS maintained an upward trajectory from 1997 to 2008 but declined slightly in 2009 during the global financial crisis, before picking up in 2010 and 2013. Regional trade declined in 2014 and 2015, which also coincided with the period of spiral fall in global commodity prices.

Nigeria is the dominant economy in terms of trade in the ECOWAS region trade as depicted in [Figure 2](#). Nigeria accounts for 34.39% of total ECOWAS regional trade.

The official trade statistics represent a modest picture of the degree of regional trade in the zone, since the bulk of regional ECOWAS trade is predominantly through the unofficial channels. This implies that the volume of intra-regional trade reported in official database is in a practical sense, a poor reflection of the actual degree of trade integration in the sub-region.

3. Methodology

3.1 Data

In this section, we explain the data. To test the effect of regional trade (trade among ECOWAS Member States) and non-regional trade (trade between ECOWAS Members States and the rest of the world) on economic growth, we used annualized panel data set that spans from 2007 to 2017. We chose this data range because of the timing of the research and the need to minimise missing observations in the baseline model. The selected ECOWAS Member

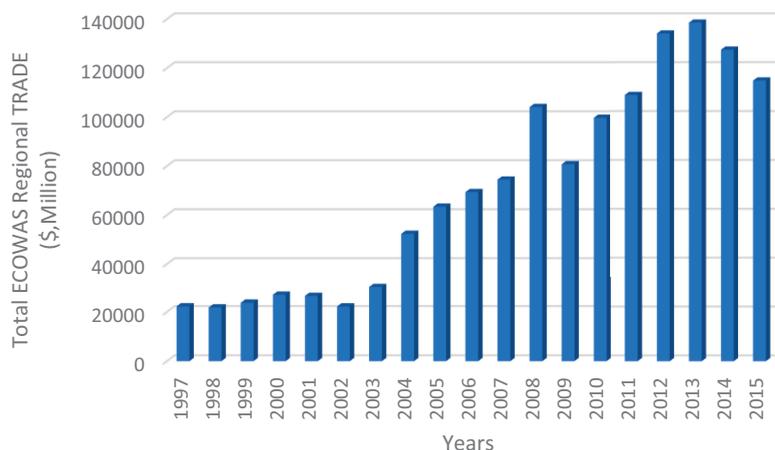


Figure 1.
Total ECOWAS regional trade (1997–2015)

Source(s): Authors' Computation Based on Trade Data from Bloomberg

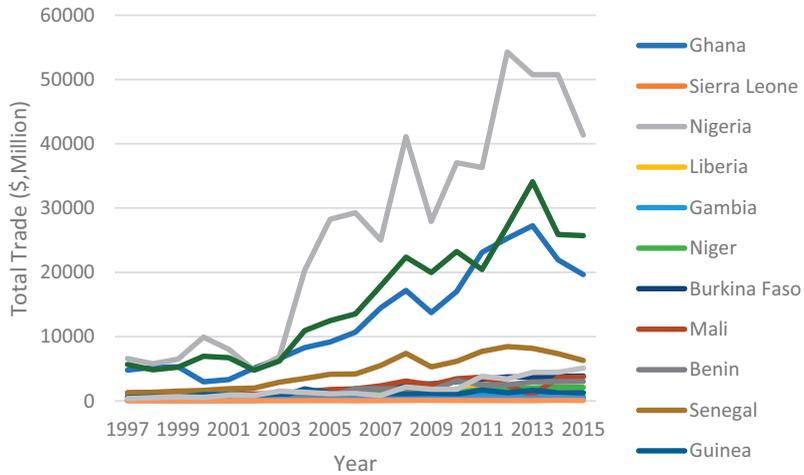


Figure 2. ECOWAS member countries contribution to regional trade

Source(s): Authors Computation Based on Trade Data from Bloomberg

States are Nigeria, Benin, Cabo Verde, The Gambia, Ghana, Guinea, Guinea Bissau, Niger, Senegal, Sierra Leone, Togo, and Mali. Cote d'Ivoire, Liberia and Burkina Faso were dropped from the observation because of non-availability of data.

The dependent variable is economic growth, which we defined as the growth rate of GDP per capita income. Per capita income is derived by dividing the nominal gross domestic product by total population. The major explanatory variables are ECOWAS regional trade and ECOWAS non-regional trade, which measure trade among ECOWAS member states and trade between ECOWAS member states and the rest of the world, respectively. Total trade is measured as export plus import (Ourens, 2016; Ghoshal, 2015). We transform the trade data by using the natural logarithm of regional and non-regional trade data. To make our findings comparable with previous empirics, some macroeconomic variables that are important determinants of economic growth were introduced to the baseline model as controlled variables. The variables are the inflation rate, exchange rate, population growth rate, unemployment rate and gross capital formation. We used the natural logarithm of gross capital formation. The data were collated from World Development Indicators.

The descriptive results are reported in Table I. The choice of the moderating variables stems mainly from the interactive influence they arguably exert on economic growth.

Table I.

Descriptive statistics

Variables	(1) N	(2) Mean	(3) Std	(4) min	(5) Max
Regional trade	132	6.158	11.147	4.865	54.284
Non-regional trade	132	15.826	35.974	23.02	182.889
Inflation rate	132	9.055	9.085	-35.84	34.70
Exchange rate	132	2.707	6.216	22.88	42.350
Economic growth	132	2.300	1.495	757.4	6.075
Population growth	132	2.670	0.632	1.060	4.515
Unemployment	132	8.681	7.204	0.800	30
Gross capital formation	132	21.49	9.803	3.554	49.79

Measures of aggregative tendencies such as the mean are presented alongside measures of spread and variation like standard deviation, minimum values and maximum values. The standard deviation of 35,974 for non-regional trade reveals that ECOWAS Member Countries trade more with the rest of the world than they trade among themselves. The standard deviation of 11,147 supports the anecdotal evidence of the larger presence of non-regional trade than regional trade in the sub-region. The descriptive results also reveal a high degree of capriciousness in inflation rates, gross capital formation and unemployment among member states, which tend to suggest the presence of heterogeneity among the economies of ECOWAS Member States.

3.2 Empirical technique

To establish the dynamic relationship between regional, non-regional trade and economic growth in ECOWAS for the period of 2007 to 2017, we employ the system GMM (Arellano and Bond, 1991; Blundell and Bond, 1998). The use of panel data enables us to investigate the dynamic relations between trade and economic growth, as well as controlling for the unobserved heterogeneity of the 12 selected ECOWAS countries. In examining the linkage between trade and economic growth, reverse causality becomes an issue since previous empirical literature has also established that causality could run from economic growth to trade and not merely vice versa. Thus, resolving the problems of causality dynamics becomes crucial to the analysis of our hypothesized link and justifies our decision to use the system GMM. First, we state the general framework for a static panel study as

$$\begin{aligned} \text{growth}_{it} = & \alpha_{it} + \beta_1 \text{regiona trade}_{it} + \beta_2 \text{nonregiona trade}_{it} + \beta_3 \text{exchange rate}_{it} \\ & + \beta_4 \text{population growth}_{it} + \beta_5 \text{unemployment rate}_{it} \\ & + \beta_6 \text{gross capital formation}_{it} + \mu_{it} \end{aligned} \quad (1)$$

where, growth is the dependent variable, regional and non-regional trade are the explanatory variables, and exchange rate, population growth, unemployment and gross capital formation are the control variables. The cross-sectional and time series dimensions are represented by i and t subscripts, respectively. The composite error term μ_{it} can be decomposed into specific effects and the remainder disturbance term. Hereafter, i represents individual member countries of ECOWAS. To capture the individual country specific effects, we decompose μ_{it} by re-writing Eqn (1) as follows:

$$\begin{aligned} \text{growth}_{it} = & \alpha_{it} + \beta_1 \text{regiona trade}_{it} + \beta_2 \text{nonregiona trade}_{it} + \beta_3 \text{exchange rate}_{it} \\ & + \beta_4 \text{population growth}_{it} + \beta_5 \text{unemployment rate}_{it} \\ & + \beta_6 \text{gross capital formation}_{it} + \eta_i + \lambda_t + \varepsilon_{it} \end{aligned} \quad (2)$$

where η_i is the country specific effects, λ_t is the time specific effect and ε_{it} is the disturbance term that captures the effects of the omitted variables. All the variables are in natural logarithm forms. Applying the baseline model in Eqn (2), we compare estimates from pooled ordinary least square (OLS), panel fixed effects (FEs), random effects (REs) and least square dummy variable (LSDV) models. The Hausman test is used to compare estimates from the RE with that of the FE.

As stated earlier, some of the variables are endogenous in nature. To address the probable endogeneity problems that might be present in Eqn (2), we apply instrumental variable (IV) regression model, based on the GMM technique. We validate the instruments by adopting Roodman (2009a, b)'s prescription, through the imposition of lags and collapse to reduce the proliferation of instruments. The lag of the dependent variable is used to indicate the dynamics in the model as shown in Eqn (3) below.

$$\begin{aligned} \text{growth}_{it} = & \alpha_i + \text{growth}_{it-1} + \beta_1 \text{regional trade}_{it} + \beta_2 \text{nonregional trade}_{it} \\ & + \beta_3 \text{exchange rate}_{it} + \beta_4 \text{population growth}_{it} + \beta_5 \text{unemployment rate}_{it} \quad (3) \\ & + \beta_1 \text{gross capital formation}_{it} + \eta_t + \lambda_t + \varepsilon_{it} \end{aligned}$$

4. Discussion of results

The static models as specified in Eqn (1) as the baseline results are reported in Table II. Models 1, 2, 3 and 4 represent the pooled OLS, FE, LSDV and RE results, respectively. The predictive value of the exogenous variable of interest as well as the moderators is reported in Table II. The coefficients of regional trade in the static panel results were positive and statistically significant, while the coefficients of non-regional trade are positive but not statistically significant. This evidence implies that trade among ECOWAS Member countries is a major predictor of growth for the sub-region, while trade with the rest of the world is not a clear determinant of growth in the sub-region. The result also revealed that population growth and unemployment are a major impediment to growth in the sub-region, since the variables are negative but statistically significant across the four models.

The static panel results are purely a baseline results and not our basis for discussion of research findings, despite the consistency in the results across the four models, and this is because of the limitations of generalised least square (GLS). Specifically, the GLS estimator involves a quasi-demeaning of the data, which causes the dependable variable to be correlated with the quasi-demeaned residuals, making the GLS estimator biased and

Variables	(1) OLS	(2) FE	(3) LSDV	(4) RE
Regional trade	0.0846*** (0.0120)	0.0370*** (0.00414)	0.0811*** (0.0128)	0.0380*** (0.00462)
Non-regional trade	0.000325 (0.00361)	0.00123 (0.000810)	0.00210 (0.00391)	0.00128 (0.000909)
Exchange rate	-0.0277*** (0.00913)	0.0327*** (0.00347)	-0.0274*** (0.00965)	0.0317*** (0.00389)
Population growth	-1.348*** (85.67)	-97.57** (46.83)	-1.359*** (89.25)	-133.1** (51.98)
Unemployment rate	15.65** (6.809)	-31.79** (15.04)	15.64** (7.043)	-19.02 (14.91)
Gross capital formation	41.44*** (5.343)	2.742 (2.332)	44.86*** (5.817)	3.162 (2.607)
Constant	4.515*** (296.1)	2.436*** (179.7)	4.650*** (357.2)	2.499*** (301.4)
Observations	132	132	132	132
R-squared	0.849	0.800	0.856	
Country effect	NO	YES	YES	YES
Year effect	NO	NO	NO	NO
F-test	111	71.91	34.95	
Prob > F	0	0	0	
No of countries		12		12
Wald-chi ²				352
Prob > chi ²				0

Table II.
Static panel data
analyses

Note(s): Standard errors in parentheses; **p* < 0.1, ***p* < 0.05, ****p* < 0.01

inconsistent. Aside from the above limitation of GLS estimator, we are also interested in the dynamic behaviour of the variables. These factors influenced our decision to adopt the dynamic GMM since the dynamic model has the tendency to overcome the deficiencies of the static model (Arellano and Bond, 1991; Blundell and Bond, 1998).

The Arellano and Bond (1991)'s dynamic difference GMM results are presented in Table III. Models 1 and 2 represent the one-step Arellano–Bond GMM estimator, while models 2 and 3 present the two-step Arellano–Bond GMM estimator. Our decision to use the two-step Arellano–Bond GMM estimator is based on the fact that it yields a more asymptotically efficient estimate compared to the one-step. The results that collapse the instrument matrix followed Roodman (2009b), which is considered more efficient since it strives to limit spurious results that might be associated with the proliferation of instruments. However, there are diagnostic issues with the result. The Sargan test in the result of the collapsed instrument matrix suggests the presence of the likelihood of over identification and misspecification problems (DGMM1-CL- (a) 0.01 and DGMM2-CL- (a) 0.0193) (see Roodman, 2006). This indicates a possible correlation of the residuals and the IVs. Though the Hansen tests and the AR (1) and AR (2) show that there is a proper correction of serial correlation, there are inherent limitations of the difference GMM for which cause we settled for the system GMM in estimating the relationship between trade and economic growth. One major problem with the difference GMM is that lagged levels are poor instruments for the first difference if variables are close to a random walk (Bond, 2002; Rodman, 2009a and Sarafidis *et al.*, 2009). Despite the superiority of the difference GMM estimator, over the static models, the results

Variables	(1) DGMM1	(2) DGMM1-CL-a	(3) DGMM2	(4) DGMM2-CL-a
Regional trade	0.0348*** (0.00818)	0.0233*** (0.00812)	0.0388*** (0.00979)	0.0214* (0.0123)
Non-regional trade	0.000567 (0.000656)	0.000400 (0.000660)	0.000360 (0.000746)	0.000638 (0.00138)
Exchange rate	0.0346*** (0.00526)	0.0334*** (0.00815)	0.0292*** (0.00846)	0.0368*** (0.0165)
Population growth	-60.09* (32.44)	-8.038 (42.63)	-409.3 (516.7)	9.300 (59.70)
Unemployment rate	-38.70 (33.01)	-38.54 (28.13)	-49.74 (43.88)	-48.17 (53.30)
Gross capital formation	3.042 (6.665)	-1.007 (2.422)	-1.427 (5.448)	-0.372 (3.402)
Observations	132	132	132	132
No of countries	12	12	12	12
Country effect	YES	YES	YES	YES
Year effect	NO	NO	NO	NO
Hansen_test	3.153	8.768	3.153	8.768
Hansen prob	1	0.119	1	0.119
Sargan_test	146.5	104.3	146.5	104.3
Sargan prob	5.43e-09	0	5.43e-09	0
AR(1)_test	-1.317	-1.464	-1.046	-1.222
AR(1)_p-value	0.188	0.143	0.296	0.222
AR(2)_test	0.801	0.783	1.191	0.802
AR(2)_p-value	0.423	0.434	0.234	0.422
No. of instruments	67	11	67	11

Note(s): Robust standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; DGMM1 and DGMM2 denote one-step and two-step difference GMM, respectively. Regressions with suffix “CL” follow Roodman (2009b) and collapse the instrument matrix. a denotes lag (1 5)

Table III. Dynamic panel data analyses-difference GMM

are relatively consistent. For instance, regional trade was positive and statistically significant across the four models of difference GMM, while non-regional trade was not statistically significant, though positive. Unemployment rate and population growth were negative across the four models also, indicating population growth and unemployment as major impediments to growth in ECOWAS.

The weaknesses associated with difference GMM influenced our decision to migrate to the system GMM since system GMM produces a more consistent estimator in the face of persistence in the series, by addressing large sample bias in the presence of additional moment conditions (Blundell and Bond, 1998, 2000; Rodmann, 2009b). The system GMM forms the basis for estimating the relationship between trade and economic growth over and above the static models and the difference GMM. We also estimated the one-step and two-step estimators based on reasons previously discussed (Ujunwa *et al.*, 2018; Afangideh, *et al.*, 2018). The results of models 4 and 5 in Table IV form the basis of our analysis.

The results of the system GMM in model 4 and 5 reveal that the estimated coefficients of lagged economic growth in the models are highly persistent, positive and significant, suggesting that the previous value of growth strongly affects the current value. The results also revealed that regional trade is a major driver of growth, while non-regional trade negatively affects economic growth, though it is not statistically significant. This finding tends to validate the results of the static and difference GMM models, which suggest that non-regional trade is not a clear determinant of growth in ECOWAS. The results of the controlled

Variables	(1) SGMM1	(2) SGMM1-CL-a	(3) SGMM2	(4) SGMM2-CL-a	(5) SGMM2-END-CL-a
Leconomic_growth	0.971*** (0.0306)	0.920*** (0.0563)	0.885*** (0.0571)	0.993*** (0.0711)	0.783*** (0.0833)
Regional trade	0.00493 (0.00328)	0.00972** (0.00485)	0.0120*** (0.00428)	0.00479*** (0.00589)	0.0200*** (0.00656)
Non-regional trade	0.000272 (0.000322)	-3.64e-05 (0.000458)	-0.000322 (0.000354)	-0.000194 (0.000631)	-0.000164 (0.000361)
Exchange rate	-0.000455*** (0.00133)	-0.00185*** (0.00201)	-0.00460*** (0.00326)	-0.04561*** (0.00229)	-0.00360*** (0.00395)
Population growth	-75.26 (50.63)	-147.9 (101.3)	-281.0** (132.3)	-31.88 (122.0)	-348.4** (169.4)
Unemployment rate	-0.0133 (0.655)	0.770 (1.244)	-2.797** (8.729)	-0.790** (1.245)	-1.036** (1.715)
Gross capita formation	3.428 (2.159)	5.259 (3.392)	2.469* (1.486)	1.563 (4.189)	9.813 (5.982)
Constant	207.1 (146.0)	453.8 (307.5)	995.5** (503.7)	86.27 (371.2)	1.154** (509.6)
Observations	132	132	132	132	132
No of countries	12	12	12	12	12
Country effect	YES	YES	YES	YES	YES
Year effect	NO	NO	NO	NO	NO
Hansen prob	1	0.902	0.902	0.275	0.252
Sargan prob	6.28e-10	9.22e-11	9.22e-11	1.11e-08	0.0434
AR(1)_p-value	0.489	0.529	0.459	0.576	0.465
AR(2)_p-value	0.127	0.138	0.108	0.119	0.235
No. of instruments	79	13	13	10	11

Table IV. Dynamic panel data analyses – system GMM

Note(s): Robust standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; SGMM1 and SGMM2 denote one-step and two-step GMM, respectively. Also regressions with suffix “END” treat intra-trade and lagged economic_growth as endogenous. Regressions with suffix “CL” follow Roodman (2009b) and collapse the instrument matrix. a and b denote lag(1 5) and lag(2 4), respectively

variables are also very interesting. The estimated coefficients of exchange rate also revealed that depreciation hurts economic growth while appreciation promotes economic growth, bringing to the fore the imperativeness of promoting a strong value of ECOWAS Member State currencies. The coefficient of population growth and unemployment rate are negative and statistically significant indicating that population growth and unemployment rate are major impediments to growth in ECOWAS.

On the validity of the selected models, the differences in the five models have been succinctly explained in the footnote of [Table IV](#). Model 1 is one-step, which is not corrected for the proliferation of instruments. Model 2 is also one-step, but it corrects for the proliferation of instruments. Model 3 is two-step not corrected for the proliferation of instruments, while model 4 is two-step corrected for the proliferation of instrument of lag (1–5). Model 5 is two-step, which treats the independent variables and the lagged value of inequality as endogenous and follows [Roodman \(2009b\)](#)'s prescription for correcting proliferation of instrument with lag (2–4). Effectively, models 4 and 5 reduced the number of instruments to 10 and 11, respectively, which is less than the 12 selected countries. The AR (1) and AR (2) results validates the specification of the model. The results of Hansen J-test (mostly used to validate over-identifying restrictions) and Sagan test shows that model specification is valid. The result is consistent with [Roodman \(2009a\)](#) which requires that “the estimated coefficient on the lagged dependent variable in the model should point out convergence by having a value less than (absolute) unity”. The estimated coefficient of the lagged growth in models 4 and 5 are 0.993 and 0.783, respectively, revealing that the steady state assumption for instrument validity holds for the models.

5. Conclusion and policy implication

This paper investigates the impact of trade on economic growth using data from the 12 ECOWAS Member Countries from 2007 to 2017. The study contributes to the trade growth nexus by decomposing the ECOWAS trade into regional and non-regional trade. This is to enable the authors investigate the effect of regional and non-regional trade on economic growth. The findings of the study bring to the fore the imperativeness of rethinking growth strategy and economic integration among ECOWAS member states. For instance, the results show that trade between ECOWAS Member States is an important predictor of growth, while trade with the rest of the world either hurts the economies or does not promote growth. This finding is consistent with the competitiveness problem and factor-price-equalization theories ([Pierce and Schott, 2016, 2017](#)), and could be explained by the nature of ECOWAS trade with the result of the world. Specifically, ECOWAS member states export primary products (commodities) and import finished goods, which might be inimical to growth.

The results also reveal that currency depreciation hurt growth in ECOWAS. This finding contradicts traditional economic theory but could be explained by the fact that ECOWAS Member States are net importers and import from the rest of the world is inelastic, irrespective of the exchange rate. The study has clearly shown that population explosion and rising unemployment could be another deterrent to growth in ECOWAS. Development agenda could also prioritize and mainstream birth control and productive growth through value addition to the exported commodities. These policies could automatically promote exchange rate appreciation, population control and unemployment reduction in ECOWAS sub-region.

The results of the study shows that the ECOWAS Monetary Cooperation Programme could serve as a catalyst for growth, if Member States embark on policies that promote trade integration. Such policies include diversifying the economies through value chain to promote competition instead of complementarity. For instance, deepening the manufacturing industry base, lowering the cost of doing business, making massive investment in infrastructure and embarking on structural reforms that eliminates labour market rigidities could improve

competition in the sub-region. ECOWAS Member States could also pursue deliberate efforts to reduce trade barriers in the sub-region. Such efforts could include promoting the convertibility of Member States national currencies in the sub-region, elimination trade barriers and joint investment regional trade-related infrastructures such investments on linkages roads and seaports.

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