## Does Trade Tariff Liberalisation Matter for Intra-ECOWAS Trade?

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### Abstract

*Purpose – The purpose of this paper is to examine the relationship between trade liberalisation and intra-regional trade in some selected ECOWAS member countries, with particular focus on the role of applied and most favoured nation import tariffs.*

*Design/methodology/approach – Data utilized were sourced from the World Bank's World Development and Governance Indicators, Mayer and Zignago (2006) distance index as well as the World Trade Organisation's World Integrated Trade System (WiTs). The sample period consists of 8 countries covering the years 1998 to 2011. Predicated on a gravity framework, system and difference generalised method of moments dynamic panel data estimators were relied upon.*

*Findings – The empirical results showed that trade liberalisation has contributed to intra-regional trade in the West African sub-region. The potency of trade liberalisation was relatively more pronounced through the use of most favoured nation import tariff compared to applied import tariff rates. Our results also showed that improved institutional quality and infrastructure are associated with higher intra-ECOWAS trade. Furthermore, using alternative measures of institutional quality and infrastructure as well as fixed and random effect estimators validated our findings.*

*Research limitations/implications – Data limitations led to the inclusion of only 8 out of the 15 ECOWAS member countries in the sample. The research was also limited to tariff barriers as measure of trade liberalisation. The same methodology can be applied as data becomes available while a consideration of non-tariff barriers could provide more insights on the dynamics of intra-ECOWAS trade.*

*Originality/value – The findings reinforce the notion that removal of trade restrictions particularly in the manufacturing sector, good governance and infrastructural developments enhance trade amongst ECOWAS countries.*

## 1. Introduction

The Economic Community of West African States (ECOWAS) accord in 1975 led to the formal emergence of a regional body-ECOWAS- currently made up of 15 member countries: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo[1]. In 1993, the ECOWAS Treaty was revised to speed up the integration process and to establish an economic and monetary union with a view to boosting economic growth and development in Africa (Diop et al., 2008). The thrust of this revision were: complete removal of customs duties and other non-tariff barriers on intra-ECOWAS trade, regional trade liberalisation through the setting up a CET, integrating economic and financial policies as well as the launch of a single monetary zone.

Intra-ECOWAS trade flows have remained low despite significant deployment of policy prescriptions towards a common monetary and economic union[2]. Existing evidence suggest that intra-ECOWAS trade has continued to increase albeit slight fluctuations over the years. In 1980,

intra-regional export as a percentage of total exports was 10.1%, increasing to 10.7% by 1998 and declined thereafter to 9.6% in 2001 and increased marginally to 12.0% in 2010 (WDI, 2010). The prospect for significant trade amongst ECOWAS member countries has been constrained by amongst others, parallel or non-complementary production structures across member countries (Chete and Adewuyi, 2012). In addition, the question as to whether trade agreements such as the ECOWAS Common External Tariffs (CETs) within the broad-based ECOWAS Trade Liberalisation Scheme (ETLS) embarked upon are drivers of accelerated growth and enhanced regional cooperation amongst West African countries.

The benefits of intra-regional trade include: (i) enlarged regional markets which provide incentives for private cross-border and foreign direct investments flows, especially for large-scale investments in manufacturing and service projects which are subject to economies of scale; (ii) expanded intra-ECOWAS trade should generate faster growth and income convergence particular

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[1]Eight ECOWAS member countries- Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo- formed the West African Economic and Monetary Union (WAEMU otherwise known as UEMOA) whereas Liberia, Sierra Leone, Guinea and Cote d'Ivoire forged an economic alliance under the Manu River Union (MRU).

[2] These include the Common External Tariffs (CETs), ECOWAS Trade Liberalisation Scheme (ETLS), Free movement of persons, common infrastructural development, right of residence and establishment, common currency amongst others.

within the context of attaining and sustaining the ECOWAS convergence criteria[3]. It is against this background that West African economies are, especially in the 21st century, fast embracing intra-regional trade and using it as a tool for development; with the hope that this will ultimately not only foster mutual socio-economic, political, security and cultural cooperation but obviate the long-term dependence of West African countries on developed markets.

A key element of the union, ECOWAS Trade Liberalisation Scheme (ETLS), is an incentive geared at gradual to complete removal of trade restrictions amongst member countries. This is expected to, through trade induced market opportunities; foster regional economic development which in turn generates employment of more labour and capital to meet regional market needs. However, existing evidence suggests that the ECOWAS trade liberalisation scheme has been marked by the unwillingness of many countries to implement its provisions relating to elimination of tariff and non-tariff barriers to trade and the functioning of a compensation

mechanism (Ajayi, 2005). None-theless, intra-ECOWAS trade has increased marginally within the ECOWAS sub-region as indicated by the trend in intra-ECOWAS trade as a percentage of total trade[4].

A contributory factor to this trend is the adoption the ECOWAS CET towards the second half of the last decade aimed at creating a common market. The ECOWAS-CET composed of four tariff bands- 0 (essential social goods), 5% (goods of primary necessity, raw materials and specific inputs), 10% (intermediate goods) and 20% (final consumption goods). A two-year transition period was slated to finalise the ECOWAS CET framework, while full adoption was expected by the end of 2011 (Revised Treaty, ECOWAS Executive Secretariat, Abuja, Article 3). Largely, some progress has been recorded in the reduction of external tariffs in West Africa, with tariff rates in mostly all the ECOWAS countries compressed. For instance, Ghana which recorded an average tariff rate of 40.0 per cent on manufactured products now records a low tariff rate of 8.9 per cent in 2000. Likewise Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal

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[3]ECOWAS convergence criteria are: Primary criteria- (i) Budget deficit/GDP ratio=4%, (ii) Inflation rate = 5%, (iii) Ceiling on central bank financing of budget deficit/previous years' tax revenue=10% and, (iv) Gross external reserves = 6 months of import cover. Secondary criteria- (i) Domestic arrears, (ii) Tax revenue/GDP ratio = ≥ 20%, (iii) Wage

bill/Tax revenue = ≤35%, (iv) Public investment/Tax revenue = ≥20%, (v) Positive real interest rates and, (vi) Real exchange rate stability = ± 5%.

[4] It increased from 3.1% in 1970 to 10.6% and 8.9% in 1990 before trending up to 11.1%, 10.1% and 12.2% in 1998, 2003 and 2009, respectively.

and Togo currently have simple average import tariffs of 12% within the range of 0-20% (Oyejide, 2004).

In order to boost intra-ECOWAS trade performance, several measures have been adopted to reduce anti-export bias. At the same time eliminating trade restrictions as well as significant reduction and/or total elimination of export taxes in most ECOWAS countries as enshrined in the Uruguay rounds of negotiations which led to the 1995 General Agreement on Tariffs and Trade (GATT), and subsequent World Trade Organisation (WTO) have been significant given its consequent trade-expansion effect. Table 1 in the appendix clearly shows that intra-ECOWAS trade is clearly dominated by Nigeria, Ghana, Côte d'Ivoire and Senegal. Sierra Leone, Guinea and Gambia have the smallest share of export flow across the sub-region.

A number of constraints have been identified as hampering the expected intra-ECOWAS trade expansion effect of the trade liberalisation (ECOWAS CET). Prominent among them is the notion that some countries belong to more than one regional arrangement, language barrier, divergences in macro-economic fundamentals of member countries, weak institutions, poor governance and infrastructure amongst other. Notably, a careful inspection of the data reveals that the increases recorded in intra-ECOWAS trade coincided with efforts at

promoting trade liberalisation through the reduction and removal of tariff and non-tariff barriers to trade in the sub-region. In addition, anecdotal argument suggests that there is huge potential for intra-regional trade and investment in the sub-region which could in turn stimulate regional output growth.

Several determinants of intra-regional trade have been established in the literature. These range from economic variables, such as differences in factor endowments and complementarities in trade structures, to policy variables such as tariffs and non-tariff barriers (NTBs). Other aspects such as geographical location may serve as a natural non-tariff barrier to accessing particular markets, but like other market failures may be overcome through effective and targeted government intervention (Cali, 2009). In addition to border barriers, other constraints that increase the transaction costs of trade transport and fixed-line telephone services which are limited, unreliable with notoriously high charges especially for international calls (Hatzenberg, 2010, p. 3). Information is essential to facilitate efficient market outcomes; lack of readily available information at reasonable cost will hamper market efficiency as a result of high transaction costs (*ibid.*). At the same time, the rule of law remains a critical component of government's role in regional integration. While non-tariff

measures such as institutional quality, good governance and infrastructure are perceived to be important constraints to trade in the West African sub-region, limited attempts have been made to systematically quantify their actual impact on intra-ECOWAS trade.

The outcome of trade policy harmonisation amidst adequate provisions for critical non-tariff measures in the West African sub-region is expected to have far reaching effects on the resulting patterns and dynamics of intra-ECOWAS. The primary objective of this paper, therefore, is to examine the implications of the ECOWAS trade liberalisation scheme for intra-ECOWAS trade. In addition, the study seeks to identify some of the major obstacles to trade between countries within the West African sub-region. This is crucial, if appropriate policy measures towards increasing intra-ECOWAS trade flows and attaining a common monetary and customs union.

The rest of this paper is organised as follows: the next section contains a review of the literature, while section 3 presents the data, model specification and methodology. The results of empirical analysis and robustness checks are presented in section 4 while Section 5 concludes.

## 2. Literature Review

This section briefly provides an outline of the studies conducted on and related to the effects of trade liberalisation on intra-regional trade with particular attention to West Africa. We first elucidate the analytical connection between trade liberalisation and intra-regional trade following which a review of empirical results is presented.

### 2.1 Trade Liberalisation and Intra-Regional Trade: Theoretical Review

The connection between trade liberalisation and intra-regional trade can be traced to the literature on regional integration attributable to the work of Viner (1950), who suggested that the effects of regional integration on trade can be either trade creating or trade diverting. While latter provides ample opportunities for efficient producers in the region to expand production (and benefit from economies of scale) to the advantage of consumers and the detriment of less competitive producers; the former occurs when the removal of tariffs within the region leads to goods hitherto imported from cheaper sources being replaced by more expensive suppliers within the region which can be sold for less because they no longer have to pay any import duty.

Analysis of the volume and composition of international exchange have predated the development of the monopolistic competition model of trade (Bowen, Hollander and Viaene, 1998). The gravity model can be traced to the 1950s. The model primarily relates bilateral trade to countries' incomes,

population and distance from each other, and has succeeded in accounting for variances of bilateral trade flows. The theoretical linkage between trade liberalisation and intra-regional trade can be predicated on the gravity model rooted in Newton's law of gravitational force between two objects. The model astutely provides an exposition of the linkage between volume of trade, capital flows and migration (Ogunkola, 1998; Zannou, 2010). It relates intra-regional trade between countries as a function of GDP, population and distance. Although some of the early applications of the model were not grounded in theory, subsequent researches have strengthened its theoretical foundation (Serlenga and Shin, 2013).

Regional Trade Agreements (RTAs) is important for trade creation and formation of a custom union. An important outcome of RTAs, through trade liberalisation, is to enable more efficient producers in a region to expand output via economies of scale to the advantage of consumers and the detriment of less competitive producers (Keane, Cali and Kennan, 2010). These gains are only feasible should trade restrictions be removed and harmonised. This would entail the complementarities of strong institutions, good governance, adequate infrastructure and integrating tariffs and non-tariff barriers in a bid to increase intra-regional trade flows[5]. Keane et al. (2010) identified other important determinants of intra-regional trade to include hard infrastructure like roads, energy, information communication technology and the physical networks required to support trade, as well as soft infrastructure such as institutions, related to the governance of trade (ibid.)[6].

The standard framework for the analysis of the direction of trade and, more specifically, of the potential and realised trade flows, involves the application of the gravity model (See Babatunde, 2006; Ajayi, 2005; Ogunkola, 2006; Ok, 2010; Adam, 2012; Ravi 2013). The gravity model has proven to be the most accurate tool for the explanation and prediction of bilateral trade flows (Freinkman, et al 2004) and is analytically convenient and easy to augment with the so-called emerging determinants. The theoretical foundations of the gravity model gave rise to models rooted in the spirit of Heckscher-Ohlin model

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[5] This includes the development of regional NTMs to increase intra-regional trade flows, such as harmonised standards to facilitate trade, as well as Rules of Origin (RoO) which are required to avoid trade deflection (Keane et al., 2010).

[6] This may for instance be viewed from the need for requisite infrastructure being available for trade flows between landlocked and exporting countries within the same region.

(Deardorff 1997) and differentiated product-monopolistic competition (DPMC) model (Helpman and Krugman, 1985; Helpman, 1987). Because trade in differentiated products pertains primarily to trade in manufactures, this model describes only manufactured trade flows.

A vast pool of literature assessing the potential impact of trade liberalisation on intra-regional trade has been predicated on neoclassical trade models. The gains from increased trade arise from countries being able to pursue comparative advantage based on having different factor endowments (as in the Heckscher-Ohlin model). New trade theory not only considers neoclassical market structures to incorporate features such as increasing returns, imperfect competition, technology transfers, trade externalities, but dynamic effects as well. This includes links between trade liberalisation, total factor productivity growth, and capital stock accumulation.

Further extensions of the neoclassical models are the factor price equalisation and specific factor model. Notably, analysis these models suggest that trade liberalisation leads to welfare improvement but the gains are quite small considering the experience of countries which shifted to open development strategies (Robinson and Thierfelder, 2002). New trade theory not only considers neoclassical market structures but incorporates

increasing returns, imperfect competition, technology transfers, trade externalities, and dynamic effects as well. This includes links between trade liberalisation, total factor productivity growth, and capital stock accumulation.

Empirical studies of intra-regional trade in ECOWAS incorporating elements of new trade theory with the gravity model invariably find that trade creation greatly dominates trade diversion and, usually, there is no trade diversion at all since the increased growth of RTA members leads to expanded trade both within the RTA and between member countries and the rest of the world (Babatunde, 2006). Yet, these models have failed to account for important elements that support regional trade liberalisation such as institutional quality and infrastructure.

## 2.2 The Empirical Outcomes

While there exist an extensive empirical literature that examines the determinants of intra-ECOWAS trade and its linkages to investment flows, studies explicitly dealing with the relationship between trade liberalisation and intra-ECOWAS trade is scanty. A strand of the literature examining the RTAs and intra-regional trade within African regional groupings and related issues include studies by Ogunkola, 1998; Oyejide, 2004; Carrere, 2004; Keane et al., 2010; Agbodji, 2008, amongst others. Others have examined the importance and/or role of

infrastructure within the context of regional integration and overall economic development (Ndulu, 2006; Mbekeani, 2010; Calderon and Serveen, 2010; Ajakaiye and Ncube, 2010). These studies have stressed the critical role of infrastructural development towards boosting intra-regional trade and development.

Many of the recognised constraints to intra-ECOWAS trade are on the supply side of economic activity and this includes poor governance, weak institutions and infrastructure deficit amongst others undermine production capacity. The most important NTBs hindering regional trade in the East and Southern African region include custom procedures and administra-tive requirements, technical standards and lack of physical infrastructure and this increases the cost of intra-regional trade (Hatzenberg, 2011; Viljoen, 2011). The importance of rule of law cannot be downplayed as the World Bank (2011) argued that well functioning judicial systems and courts help businesses expand their networks and markets. The World Economic Forum of 2010 noted that some of the constraints for doing business in West Africa include access to finance, corruption, weak and burdensome tax laws as well as infrastructure deficit.

Ogunkola (1998) investigated the potential benefits of trade liberalisation to West African via increased intra-regional trade flows using a gravity model. The findings showed that the effects of ECOWAS trade liberalisation on intra-regional trade flows have been minimal and this may be party explained by the absence of institutions and governance which play a vital role towards trade liberalisation efforts. As noted by Keane et al (2010), non-tariff barriers are impediments to intra-SADC trade. Meyer (2010) noted that technical barriers to trade are not an important issue in regional trade agreements in Sub-Saharan Africa while Zannou (2010) highlights depreciation of exchange rates and openness of economies as important determinants of intra-ECOWAS trade.

Ok (2010) in an assessment of intra-EU trade using the gravity model revealed that these income, competitiveness and distance were significant factors in explaining intra-EU trade. Anderson (2010) carried out a comprehensive review of empirical applications of the gravity model and concluded that more accurate estimations and interpret-tation of spatial relations based on the gravity model have emerged. Ravi (2013) found that intra-regional trade in the Gulf Cooperation Council (GCC) is still at a modest level, where the trade intensity exhibited negative signals. This suggests that the GCC is yet to achieve a high level of intra-regional trade, primarily due to high oil revenue inflows.

Adam (2012) in an evaluation of intra-ECOWAS trade concluded that the potential for trade amongst West African countries was enormous if regional integration efforts are deepened and the costs arising there from are minimised. This is particularly imperative in regional arrangements characterized by socio-economic diversities of member countries. In this regard, Ackah et al., (2013) tried to measure the associated trade cost for ECOWAS countries and infer their impact on trade flows within the region. Several other studies have considered such associated cost in the context of intra-regional trade (see, Banik and Yoonus, 2012; Chete and Adewuyi, 2012; Serlenga and Shin, 2013).

The outcome of the review suggests the need for applying relatively more advanced estimators as well as addressing growing concerns for trade liberalisation, infrastructure, institutions and governance in this crucial nexus. Moreover, these issues in the context of ECOWAS sub-region are scarcely pursued. Evidently, the focus has been on validating the gravity model without adequate attention to certain variables that may in fact reverse the nature and/or magnitude of the observed relationship. Given current developments such as the recently concluded EPA consultations between ECOWAS and the European Union which saw ECOWAS withdrawing from the agreement, it has become important to seek alternative agreements particularly given the fact that opening European markets to ECOWAS exports was at the heart of the multilateral discussions. This study is an attempt to contribute to the debate on intra-regional trade in ECOWAS.

## 3. Data, Model Specification and Methodology
### 3.1 Data
Our sample consists of 8 countries and they are Benin, Cote d'Ivoire, Gambia, Ghana, Nigeria, Senegal, Sierra Leone and Togowhile data utilised is between 1998 and 2011 (see Table 2 in the Appendix for a detailed description, measurement and sources of the variables utilised)[7]. The summary statistics and correlation analysis for selected ECOWAS are presented in Tables 1 and 2. The average value of intra-ECOWAS trade (intra) is about $21 billion, indicating reinforcing anecdotal evidence suggesting persistent increase in intra-ECOWAS trade over the years. The average distance is 370.9 km while the average real exchange rate of the ECOWAS was 628.5 to $1. The average number of fixed and mobile phone users per 100

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[7] The countries included in the analysis are Benin, Cote d'Ivoire, Gambia, Ghana, Nigeria, Senegal, Sierra Leone and Togo. The other ECOWAS countries were excluded due to insufficient data on disaggregated most favoured nation and applied import tariff rates obtained from the World Integrated Trade System (WiTs).

inhabitants is 1.46 while that of the internet (measured by internet users per 100 inhabitants) stood at 3.21. The mean value of the institutional quality variable (rolest and cocest) was a weak -0.70 and -0.67 and 2.81 indicating weak institutions and high case of corruption in the West African sub-region. There is considerable variation in the minimum and maximum applied and MFN tariff rates on manufactured, agricultural and primary products with variances ranging between 14.4% and 37.5.

**Table 1: Descriptive Statistics for Selected ECOWAS countries**

| Variable | N | Mean | Std. Dev. | Min. | Max |
|---|---|---|---|---|---|
| rgdp | 112 | 2.10E+10 | 4.54E+10 | 4.87E+08 | 2.44E+11 |
| pop | 112 | 2.61E+07 | 4.36E+07 | 1225044 | 1.62E+08 |
| rer | 112 | 628.555 | 824.793 | 0.677 | 2951.764 |
| dist | 112 | 370.891 | 854.523 | 4.291 | 3350.319 |
| intra | 112 | 794431.4 | 1471705 | 525.397 | 7924339 |
| atrap | 112 | 14.609 | 3.341` | 10.59 | 25.42 |
| atrmp | 112 | 14.341 | 3.449 | 10.31 | 24.75 |
| atrpp | 112 | 16.599 | 4.763 | 11.82 | 45.29 |
| mfntrap | 112 | 13.943 | 4.698 | 10.91 | 33.29 |
| mfntrmp | 112 | 13.722 | 4.429 | 10.53 | 28.64 |
| mfntrpp | 112 | 14.606 | 6.063 | 11.76 | 49.32 |
| tele | 112 | 1.463 | 0.843 | 0.239 | 3.574 |
| internet | 112 | 3.206 | 5.085 | 0.015 | 28.43 |
| rolest | 112 | -0.698 | 0.527 | -1.652 | 0.163 |
| cocest | 112 | -0.665 | 0.393 | -1.447 | 0.34 |

Correlation analysis result showed that a relatively low and negative linear association existed between intra-ECOWAS trade and applied and MFN tariffs on agriculture, manufactured and primary commodeties in the sample countries. The infrastructure (internet) and institutional quality variable were positively correlated with the volume of intra-ECOWAS trade recording 35% and 4%, respectively. An approxi-mate 50% positive correlation between intra-ECOWAS trade 9intra) and real gross domestic product (rgdp) while population and distance were 47% and 42% linearly associated with the volume of intra-ECOWAS trade. The negative correlation of 29% between real exchange rate (rer) and intra-ECOWAS trade (intra) suggests that the exchange rate policy synchronicity is a valid driver of trade amongst member countries of the sub-region.

## Table 2: Pairwise Correlation Matrix for Selected ECOWAS Countries

|  | rgdp | pop | rer | dist | intra | atrap | atrmp | atrpp | mfntrap | mfntr mp | mfntr pp | tele | inter net | rolest | cocest |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| rgdp | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| pop | 0.877 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| rer | -0.243 | -0.271 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| dist | 0.910 | 0.979 | -0.240 | 1 |  |  |  |  |  |  |  |  |  |  |  |
| intra | 0.496 | 0.465 | -0.290 | 0.419 | 1 |  |  |  |  |  |  |  |  |  |  |
| atrap | -0.217 | 0.040 | -0.221 | -0.004 | -0.222 | 1 |  |  |  |  |  |  |  |  |  |
| atrmp | -0.225 | -0.007 | -0.242 | -0.038 | -0.241 | 0.990 | 1 |  |  |  |  |  |  |  |  |
| atrpp | -0.061 | 0.293 | -0.065 | 0.217 | -0.028 | 0.763 | 0.667 | 1 |  |  |  |  |  |  |  |
| mfntrap | -0.046 | 0.221 | -0.298 | 0.180 | -0.072 | 0.963 | 0.941 | 0.815 | 1 |  |  |  |  |  |  |
| mfntrmp | -0.076 | 0.172 | -0.309 | 0.134 | -0.101 | 0.972 | 0.965 | 0.748 | 0.992 | 1 |  |  |  |  |  |
| mfntrpp | 0.032 | 0.329 | -0.254 | 0.283 | 0.001 | 0.874 | 0.817 | 0.926 | 0.952 | 0.907 | 1 |  |  |  |  |
| tele | -0.260 | -0.360 | -0.446 | -0.318 | -0.214 | 0.171 | 0.245 | -0.221 | 0.126 | 0.178 | -0.009 | 1 |  |  |  |
| internet | 0.658 | 0.403 | -0.293 | 0.433 | 0.354 | -0.232 | -0.202 | -0.268 | -0.152 | -0.158 | -0.126 | 0.202 | 1 |  |  |
| rolest | -0.314 | -0.409 | -0.368 | -0.401 | -0.106 | 0.088 | 0.134 | -0.162 | 0.065 | 0.098 | -0.020 | 0.442 | 0.047 | 1 |  |
| cocest | -0.288 | -0.407 | -0.229 | -0.406 | 0.043 | -0.050 | -0.020 | -0.194 | -0.081 | -0.057 | -0.136 | 0.280 | -0.005 | 0.852 | 1 |

### 3.2 Model Specification

The theoretical linkage between trade liberalisation and intra-regional trade, through logical deduction, traced to the gravity model rooted in Newton's law of gravitational force between two objects. The model astutely provides an exposition of the linkage between volume of trade, capital flows and migration. In other words, it deploys a platform for the volume of trade between or amongst countries as a function of GDP, population and distance. Thus, the effect of trade policies on intra-ECOWAS trade can be analysed by augmenting the model with relevant policy variables. This study relies on an augmented gravity model in the spirit of Anderson (2010) and also recognises the role of trade policy, institutions and infrastructure on the volume of intra-ECOWAS trade following Babatunde (2006) and Serlenga and Shin (2013). Thus the model specifies intra-ECOWAS trade flows as a function of traditional and other emerging variables:

$$INTRA_{it} = f(X_{it}, Y_{it}) \quad (1)$$

where $INTRA_{it}$ is intra-ECOWAS exports between country (i) and country (j) at time (t), $Y_{it}$ is a vector of traditional determinants of intra-ECOWAS trade- real GDP (RGDP), real exchange rate (RER), population (POP), common language (ANGLO and FRANCO), distance (DIST); $X_{it}$, is a vector of emerging driving factors made up of infrastructure (INFRA), institutional quality (INSTQ), applied import tariff rates (all products-ATRAP, manufactured products-ATRMP and primary products-ATRPP), most favoured nation tariff rates (all products-MFNTRAP, manufactures-MFNTRMP and primary products-MFNTRPP). The subscripts i, j denote countries while t represents time period.

According to Ajayi (2005), the inclusion of political factors could contribute valuable information to understanding trade relations within ECOWAS especially in view of the political instability of some member countries. Consequently, Babatunde (2006) extends the model by examining the impact of political stability on export performance within ECOWAS. The study found this index to be wrongly signed and insignificant. This strongly suggests the use of broad governance indicators that account for institutions and governance and thus justifies our inclusion of these variables. As rightly noted in Babatunde's study, sensitivity analysis may be carried out using the International Country Risk Guide data on political climate since they provide data on corruption, quality of government and rule of law.

Trade between countries is estimated to be proportional to their combined economic mass (measured by GDP per capita) and inversely proportional to their distance apart in the basic form of the gravity model. Thus, a higher income level signifies

greater potential supply from the exporting country and increased demand in the importing country, leading to a positive effect on trade. However, a large population is expected to increase the ratio of domestic to foreign market production, which should allow greater output diversification. The result is expected lower potential demand in the importing country and lower potential supply from the exporting country, leading to an overall decrease in imports. The combined effect of GDP per capita is, however, positive. In addition, distance is expected to increase transport costs which in turn impedes intra-ECOWAS trade flows.

The volume of intra-ECOWAS trade is expected to rise as real output, openness and population of West African countries increase. An increase in real exchange rate, indicating depreciation of the local currency unit against the US dollar, creates disincentives to trade and is thus expected to negatively affect intra-ECOWAS trade. Better infrastructure and institutional quality are expected to boost trading activities amongst ECOWAS countries since this implies lesser bureaucracy and enhanced communication capacity while import tariffs are expected to be negatively related to intra-ECOWAS

trade (see, Ajayi and Ncube, 2010). *Apriori*, the longer the distance amongst ECOWAS member countries, the lower the level of intra-regional trade while common language between countries is expected to increase trading activities between countries. Lower import tariffs are expected to increase intra-ECOWAS trade.

## 3.3 Estimation Technique

The models adopted and adapted to this study are estimated using the system and difference GMM estimators proposed by Holtz-Eakin, Newey and Rosen (1988), Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998)[8]. While the difference GMM estimators is predicated on transformation of independent variables via dif-ferencing and uses the GMM, the system GMM on the other hand augments this approach by assuming that the first differences of instruments are uncorrelated with the fixed effects. This allows the introduction of more instruments and can profoundly improve efficiency (Roodman, 2009b). The model may contain specific effects and therefore, to suppress the effects, the model is converted to first difference. This implies that the country-specific effects is neutralised since it does not vary with time. The resulting equation is:

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[8] Both estimators are suited for regressions featuring independent variables that are not strictly exogenous, fixed effects, heteroscedasticity, and serial correlation within but not across individuals (Roodman, 2009a).

$$\Delta INTRA_{it} = \beta_1 \Delta INTRA_{i,t-1} + \beta_2 \Delta Y_{it} + \beta_3 \Delta X_{it} + \Delta \varepsilon_{it} \qquad (2)$$

The fixed effects are encompassed in $\varepsilon_{it}$; the error term, assumed to be white noise and consists of the unobserved country-specific effects, $v_i$ and the observation specific error, $e_{it}$. That is, $\Delta \varepsilon_{it} = \Delta v_i + \Delta e_{it}$; and $\varepsilon_{it} = v_i + e_{it}$ for $i = 1, \dots, N$ and $t = 2, \dots, T$. Although the optimal weighting matrix for the estimator has been shown to result in an asymptotically efficient two-step GMM estimator[9], Monte Carlo simulations have shown that efficiency gain is typically small and that the two-step GMM estimator has the disadvantage of converging to its asymptotic distribution relatively slowly (Bond, Hoeffler and Temple, 2001)[10]. Thus, we rely on the one-step GMM estimator, with standard errors that are not only asymptotically robust to hetero-scedasticity but have also been found to be more reliable for finite sample inference (see Blundell and Bond, 1998).

## 4. Discussion of Empirical Results

For the system GMM, the equations in levels and first differences are estimated as a system, with the applied import tariff rates instrumented by the second and third lag of its difference. Likewise the mfn tariffs is instrumented either by its own lagged differences or by both lagged levels and differences. This is in view of the fact that limiting the number of lags used as instruments in the GMM estimations keeps the instrument count low and improves the Hansen J test for joint validity of those instruments (Roodman, 2009b). All variables in the difference GMM estimations are differenced and the first difference of the import tariffs is instrumented by its own 2 lag in levels, one excluded exogenous variable (ivstyle instrument)-gdp per capita and all exogenous variables included in the specification. Instructively, the second-order correlation in all specifications does not reject the null hypothesis of no autocorrelation while the p-values of the Sargan test of over identifying restrictions does not reject the null hypothesis that the instruments are exogenous in any equation.

Table 3 depicts the empirical result from our model. All estimated models are based on small sample adjustment and the t-statistic is reported. The one-step estimation procedure is relied upon since the resulting standard errors are consistent with panel-specific

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[9] See Hansen (1982) and Chamberlain (1987) for a description of asymptotic efficiency with conditional moment restriction and large sample size properties of GMM estimators.

[10] They further argued that in finite samples, the asymptotic standard errors associated with two-step GMM estimators can be seriously downward biased, and thus form an unreliable guide for inference.

autocorrelation and heteroske-dasticity and avoid the downward bias that characterises the standard errors of the two-step estimation. The result or model 1 in the first column reveals that real output exerts a positive and significant influence on the intra-ECOWAS trade while it has an infinitesimally small negative effect on while distance and common language have a positive and negative impact respectively on trade within the region. Lowering MFN tariffs on manufactured and primary products led to a high increase in the volume of trade among ECOWAS member countries. This conforms to earlier findings by Babatunde (2006) even though the study relied on aggregate tariffs. Unexpectedly, a 1% increase in MFN tariffs on agricultural products led to a 35.4% in intra-ECOWAS TRADE. In model 2, applied tariff rate on agricultural products is a negative function of intra-ECOWAS trade but is statistically insignificant. However, real exchange rate depreciation had a negligible negative effect on intra-ECOWAS trade while common language coefficient was negative and statistically significant at 10%.

In model 3, infrastructure measure proxied by the number of telephone lines per 1000 inhabitants is introduced but had an unexpected negative influence on regional trade. This finding was contrary to Ajakaiye and Ncube (2010) whose study suggested otherwise. This may be attributed to poor connectivity issues between and amongst the various service providers which in turn reduced its positive effect on intra-ECOWAS trade. However, increased investment in telephone lines in West Africa increased trade amongst ECOWAS member countries by about 0.29% and 0.26% in models 5 and 6, respectively in line with the findings of Mbekeani (2010).The institutional quality index as captured by the rule of law estimate were both insignificant with a positive and negative coefficients in models 5 and 6, respectively.

Notably, MFN tariffs, which countries have bounds to impose on imports of others unless such a country is part of a broad preferential trade agreement are all negative and statistically significant in model 6. This suggests that reducing restrictions on agric and manufactured and indeed primary products will increase the volume of trade in intra-ECOWAS countries.

**Table 3: System GMM Result**

| Dep. Var.: Intra | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| rgdp | 0.355*** (0.187) | 0.140 (0.180) | 0.430** (0.200) | 0.204 (0.177) | 0.298 (0.216) | 0.337** (0.170) |

| | | | | | | |
|---|---|---|---|---|---|---|
| pop | -0.270 (0.251) | -0.013 (0.267) | -0.292 (0.254) | -0.154 (0.250) | -0.121 (0.305) | -0.232 (0.214) |
| rer | -0.001* (0.0002) | -.0003** (0.000) | -0.001* (0.0002) | -0.0001 (0.0001) | -0.001* (0.000) | 0.001* (0.0002) |
| dist | 0.374* (0.098) | 0.039 (0.076) | -0.016 (0.095) | 0.255* (0.091) | -0.021 (0.085) | 0.074 (0.063) |
| comlang | -0.984* (0.235) | -0.282*** (0.158) | -0.532* (0.177) | -0.472* (0.175) | -0.420** (0.167) | -0.499* (0.186) |
| atrap | | -0.350 (0.892) | | | -0.560 (0.928) | |
| atrmp | | 0.255 (0.751) | | | 0.435 (0.781) | |
| atrpp | | 0.061 (0.115) | | | 0.086 (0.120) | |
| mfntrap | 35.352* (9.695) | | | | | 11.180*** (6.594) |
| mfntrmp | -27.316* (7.483) | | | | | -8.644*** (5.097) |
| mfntrpp | -7.978* (2.190) | | | | | -2.527*** (1.488) |
| tele | | | -0.533* (0.200) | | -0.288** (0.126) | -0.263** (0.110) |
| rolest | | | | 0.527** (0.214) | 0.049 (0.154) | -0.059 (0.138) |
| **Diagnostics** | | | | | | |
| Obs | 104 | 104 | 104 | 104 | 104 | 104 |
| No. of Instruments | 61 | 104 | 61 | 61 | 91 | 104 |
| F-stat | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| AR(1) Test | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| AR(2) Test | 0.442 | 0.762 | 0.507 | 0.913 | 0.433 | 0.631 |
| Sargan Test | 0.091 | 0.783 | 0.178 | 0.234 | 0.559 | 0.715 |

*Notes: (i) *, ** and *** denote significance at the 1%, 5% and 10% level. (ii) Robust Standard errors in parenthesis ( ) and P-values in [ ]*

The difference GMM estimation output is presented in Table 4. The result from model 1 in column 1 indicates that reducing applied tariff rates on agricultural producers increases intra-ECOWAS trade while a 1% increment in applied tariff rate and manufactures and primary goods induce a 2.63% and 0.26% increase in intra-ECOWAS trade. This seems quite fizzling at a first stance since one would expect a negative impact. Model one also reveals that more people increased the volume of intra-trade and this may be due to the increased output accustomed by the availability of more and relatively cheap labour.

In model 2 in the second column, liberalising trade through reduction in MFN tariffs on manufactured and primary products exert a positive impact on the intra-ECOWAS trade. An increase in the number of telephone lines installed precipitate at 1.56% increase in intra-ECOWAS trade as communication between trading partners are cased and thus barriers to trade minimised. An improvement in governance as measured by the rule of law estimate increased trade amongst West African countries by 2.75% and 1.31% in models 5 and 6, respectively.

### Table 4: Difference GMM Output

| Dep. Var.: Intra | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| rgdp | -0.679 (0.550) | 0.371 (0.411) | 0.291 (0.599) | 1.239** (0.494) | -0.143 (0.516) | -0.623 (0.427) |
| pop | 8.585* (2.823) | 1.429 (2.219) | 1.492 (3.231) | 0.115 (2.462) | 4.756*** (2.796) | 0.922 (2.310) |
| rer | -0.001 (0.001) | -0.000 (0.000) | -0.001 (0.001) | 0.001 (0.001) | -0.001 (0.001) | 0.000 (0.001) |
| dist | 0.549 (0.435) | 0.715*** (0.410) | -0.015 (0.512) | -0.204 (0.466) | 0.223 (0.417) | -0.721*** (0.413) |
| atrap | -2.877* (1.056) | | | | -2.264** (0.973) | |
| atrmp | 2.632* (0.907) | | | | 2.073** (0.833) | |
| atrpp | 0.256** (0.128) | | | | 0.204*** (0.119) | |
| mfntrap | | 19.276** (7.799) | | | | 13.13*** (7.871) |

| | | | | | |
|---|---|---|---|---|---|
| mfntrmp | | -14.862** (6.047) | | | | -10.044 (6.108) |
| mfntrpp | | -4.362** (1.750) | | | | -3.016*** (1.763) |
| tele | | | 1.557** (0.784) | | -0.197 (0.204) | 0.102 (0.134) |
| rolest | | | | -2.749* (0.569) | -0.606 (0.402) | -1.307* (0.418) |
| **Diagnostic Tests** | | | | | | |
| Obs | 104 | 104 | 104 | 104 | 104 | 104 |
| No. of Instruments | 39 | 96 | 26 | 40 | 65 | 53 |
| F-stat | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| AR(1) Test | 0.022 | 0.000 | 0.727 | 0.067 | 0.000 | 0.000 |
| AR(2) Test | 0.558 | 0.048 | 0.411 | 0.725 | 0.201 | 0.081 |
| Sargan Test | 0.321 | 0.696 | 0.974 | 0.501 | 0.148 | 0.468 |

*Notes: (i) \*, \*\* and \*\*\* denote significance at the 1%, 5% and 10% level. (ii) Robust Standard errors in parenthesis ( ) and P-values in [ ].*

For robustness, we estimate fixed and random effects models and compare with the one-step system and difference result. The fixed effect result in Table 5 shows that liberalising agriculture and manufacturing sector through import tariff reduction will boost the level of intra-regional trade in West Africa. The coefficients of population and real exchange rate carried the expected positive and negative signs, respectively similar to Ogunkola's (1998) findings. This suggest that an increase in population increases labour force which in turn contributes to aggregate output and surplus for exports while an appreciation of the currency makes more funds available to finance imports and thus promotes intra-regional trade amongst west African countries.

Notably, MFN tariffs applied to primary and manufactured goods turn out to be negative in model 2; suggesting the positive impact of liberalising trade regimes on intra-ECOWAS trade. However, MFN tariff on agricultural products had a positive impact while distance and real exchange rate were found to be negatively related to the volume of trade carried out within the West African sub region. This underscores the effect of geographical proximity towards trade and the need for increased synchronicity of exchange

rate policies towards enhanced trade within the sub-region. Our findings also showed that an increase in the number of telephone lines per hundred inhabitants provided in the sub region will lead to an increase in intra-regional trade within the ECOWAS. This finding was however found to be statistically insignificant while an improvement in the regulatory environment through enhanced institutional quality led to an improvement in intra-ECOWAS trade. The model diagnostics are satisfactory.

**Table 5: Estimation Output of Fixed Effect**

| Dep. Var.: Intra | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| constant | -7.50E+01 | 53.906 | -32.344 | -15.494 | -33.263 | -41.165 |
| rgdp | 0.172 (0.525) | 0.369 (0.419) | 0.879*** (0.466) | 1.223* (0.461) | 0.715 (0.435) | 0.763 (0.522) |
| pop | 5.095** (2.544) | 3.249 (2.182) | 1.500 (2.419) | -0.061 (0.344) | 1.452*** (2.285) | 2.046 (2.565) |
| rer | -0.002* (0.001) | -0.001*** (0.001) | -0.001*** (0.001) | -0.000 (0.001) | -0.000 (0.001) | -0.000 (0.001) |
| dist | 0.243 (0.431) | 0.948** (0.404) | 0.044 (0.432) | -0.077 (0.416) | 0.749*** (0.405) | 0.092 (0.409) |
| atrap | -1.876*** (1.105) | | | | | -1.218 (1.058) |
| atrmp | 1.720*** (0.950) | | | | | 1.201 (0.908) |
| atrpp | 0.183 (0.133) | | | | | 0.764 (0.129) |
| mfntrap | | 38.053* (6.851) | | | 32.431* (7.220) | |
| mfntrmp | | -29.486* (5.324) | | | -25.091* (5.615) | |
| mfntrpp | | -8.540* (1.532) | | | -7.301* (1.611) | |
| tele | | | 0.145 (0.170) | | 0.196 (0.146) | 0.248 (0.160) |
| rolest | | | | -1.240* (0.408) | -0.894** (0.409) | -1.507* (0.416) |

| F-Stat | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
|--------|--------|--------|--------|--------|--------|--------|
| R-Sq | 0.7054 | 0.6548 | 0.7838 | 0.6628 | 0.6056 | 0.6334 |

*Notes: (i) *, ** and *** denote significance at the 1%, 5% and 10% level. (ii) Standard errors in parenthesis ( )*

The random effect model presented in Table 6 was relatively more robust compared with the fixed effect model. However, applied tariff rate on manufactured, agricultural and primary products were insignificant but carried the expected negative sign. This is a clear departure from MFN tariffs as all its coefficients carried the expected negative sign and were statistically significant. This implies that the liberalising trade within ECOWAS would be more effective if the MFN rates were reduced as trade flows seem to be more responsive to changes in MFN import duties particularly on manufactured and primary products. Infrastructure and institutional quality as measured by telephone lines and rule of law estimates exerted a positive influence on intra-ECOWAS trade. This reinforced our earlier findings as the effects were also statistically significant. The traditional determinants were all statistically significant and conformed to theoretical expectations in all the specifications tested using random effect.

**Table 6: Estimation Output of Random Effect**

| Dep. Var.: Intra | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|------------------|---------|---------|---------|---------|---------|---------|
| constant | -26.276* (4.133) | -18.723* (4.522) | -20.537* (2.946) | -22.811* (2.597) | -11.862** (4.949) | -21.673* (4.321) |
| rgdp | 1.175* (0.226) | 0.944* (0.178) | 1.070* (0.170) | 1.056* (0.166) | 1.142* (0.180) | 1.396* (0.228) |
| pop | 0.941** (0.391) | 0.688** (0.331) | 0.661** (0.309) | 0.862* (0.274) | -0.007 (0.354) | 0.365 (0.413) |
| rer | -0.001* (0.000) | -0.002* (0.000) | -0.001* (0.000) | -0.001* (0.000) | -0.002* (0.000) | -0.002* (0.000) |
| dist | -0.631* (0.170) | -0.314 (0.194) | -0.301** (0.152) | -0.495* (0.132) | -0.183 (0.188) | -0.571* (0.167) |
| comlang | -1.441* (0.170) | -1.638* (0.168) | -1.471* (0.340) | -1.424* (0.186) | -1.577* (0.161) | -1.363* (0.170) |

| | | | | | | |
|---|---|---|---|---|---|---|
| atrap | 0.548<br>(1.068) | | | | | 0.733<br>(1.026) |
| atrmp | -0.474<br>(0.904) | | | | | -0.652<br>(0.870) |
| atrpp | -0.052<br>(0.137) | | | | | -0.069<br>(0.132) |
| mfntrap | | 25.905*<br>(7.862) | | | 30.628*<br>(7.509) | |
| mfntrmp | | -20.046*<br>(6.101) | | | -23.736*<br>(5.829) | |
| mfntrpp | | -5.835*<br>(1.761) | | | -6.882*<br>(`1.681) | |
| tele | | | -0.017<br>(0.151) | | -0.405*<br>(0.121) | -0.377*<br>(0.132) |
| rolest | | | | -0.304<br>(0.198) | -0.399**<br>(0.165) | -0.322***<br>(4.321) |
| F-Stat | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| R-Sq | 0.9314 | 0.9381 | 0.9261 | 0.9318 | 0.9469 | 0.9384 |

*Notes: (i) \*, \*\* and \*\*\* denote significance at the 1%, 5% and 10% level. (ii) Standard errors in parenthesis ( )*

Our final robustness consideration entailed using alternative measures of infrastructure and institutional quality. We used the control of corruption estimate for the latter and internet access for the former. There is abundant anecdotal evidence suggesting that time consuming and inefficient border procedures, as well as corruption in some cases, may well be more important in inhibiting intra-regional trade (Hartzenberg, 2010) The result is presented in table 7. To overcome the downward bias that characterises the standard errors of the two-step estimation, we relied on one-step estimation procedure since the standard errors are consistent with panel-specific serial correlation and heteroskedasticity.

Model 1 in column 1 shows that wider internet access and coverage has not led to an increase in trading amongst ECOWAS member countries. However, model 2 shows that improvement in terms of control of corruption led to approximately 0.70% increase in the volume of intra-ECOWAS trade. In Models 3, 4, and 5, improved internet facilities and connections led to a significant increment in trade amongst ECOWAS member countries. While

better control of corruption had an expected positive and significant impact on intra-ECOWAS trade in models 2 and 6, it was either negatively related to intra-ECOWAS trade or insignificant in the other models. The potency of trade liberalisation was only evident in model 8 and its impact was through MFN tariffs on manufactured and primary products. This lends support to our previous findings and further highlights the critical role of reducing MFN import tariffs towards promoting intra-ECOWAS trade.

**Table 7: System GMM Result Using Alternative Measures of Infrastructure and Institutional Quality**

| Dep. Var.: Intra | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
|---|---|---|---|---|---|---|---|---|
| rgdp | 0.387*** (0.218) | 0.210 (0.173) | 0.248 (0.233) | 0.353*** (0.188) | 0.937** (0.457) | 0.101 (0.416) | -0.278 (0.442) | 0.378 (0.417) |
| pop | -0.434 (0.313) | -0.117 (0.244) | -0.093 (0.337) | -0.302 (0.244) | -0.589 (2.404 | 2.982*** (2.385) | 5.553** (3.369) | 1.946 (2.304) |
| rer | -0.001*** (0.001) | -0.002*** (0.001) | -0.001* (0.000) | -0.001* (0.000) | -0.001** (0.001) | 0.002 (0.001) | -0.001** (0.001) | -0.001 (0.001) |
| dist | 0.208** (0.087) | 0.234* (0.081) | 0.060 (0.087) | 0.163** (0.068) | 0.218 (0.434) | 0.063 (0.427) | 0.713*** (0.418) | 0.783*** (0.442) |
| comlang | -0.216 (0.179) | -0.514* (0.171) | -0.276 (0.171) | -0.298 (0.183) | | | | |
| atrap | | | -0.677 (0.964) | | | | -0.792 (1.087) | |
| atrmp | | | 0.511 (0.814) | | | | 0.764 (0.932) | |
| atrpp | | | 0.103 (0.124) | | | | 0.035 (0.137) | |
| mfntrap | | | | 10.456 (6.664) | | | | 18.365** (7.952) |
| mfntrmp | | | | -8.125 (5.153) | | | | -014.163** (6.165) |
| mfntrpp | | | | -2.347 (1.503) | | | | -4.157** (1.784) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| internet | -0.031*** (0.017) | | -0.028*** (0.016) | -0.034** (0.016 | 0.040*** (0.020) | | 0.018 (0.025) | -0.016 (0.016) |
| cocest | | 0.698* (0.220) | 0.114 (0.182) | -0.018 (0.166) | | 0.572*** (0.331) | -0.632 (0.453) | 0.008 (0.314) |
| | | | | | | | | |
| **Diagnostic Tests** | | | | | | | | |
| Obs | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 |
| No. of Instrument nt | | | | | | | | |
| F-stat | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| AR(1) Test | 0.110 | 0.140 | 0.742 | 0.035 | 0.207 | 0.033 | 0.471 | 0.950 |
| AR(2) Test | 0.805 | 0.301 | 0.740 | 0.02 | 0.181 | 0.115 | 0.435 | 0.061 |
| Sargan Test | 0.184 | 0.263 | 0.525 | 0.741 | 0.232 | 0.092 | 0.363 | 0.673 |

*Notes: (i) *, ** and *** denote significance at the 1%, 5% and 10% level. (ii) Robust Standard errors in parenthesis ( ) and P-values in [ ]*

## 5. Conclusion

West Africa has strived to attain a common regional block through the pursuit of various ECOWAS-driven protocols, schedules and agreements and this has led to significant improvements in the volume of transactions in goods and services between member countries. Despite these improvements, a major component towards attaining full regional integration through the formation of a free trade area and custom union is yet to be achieved. The common external tariffs that is meant to see ECOWAS member countries reduce and realign their tariff structures to the 5 CET bands is yet to be achieved even as the broad based Economic Partnership Agreement (EPA) negotiations between ECOWAS and European Union (EU) remains a mirage in terms of full commitment particularly on the part of some ECOWAS member countries. Article 3 of the ECOWAS treaty calls for the liberalisation of trade by the abolition, among Member States, of customs duties levied on imports and exports, and the abolition among Member States, of non-tariff barriers in order to establish a Free Trade Area (FTA) at the community level. This engendered the pursuit of a FTA through the establishment of the ECOWAS Trade Liberalisation Scheme (ELTS) with the ultimate

objective of creating a common market, increasing intra-regional trade and boosting economic activity amongst others.

This study set out to empirically assess the impact of trade liberalisation on the volume of intra-regional trade in West Africa. The paper utilise dynamic panel data estimation techniques on data spanning 1998 to 2011 gathered for 6 selected ECOWAS member countries. This was guided strictly by data availability concerns; particularly applied and MFN tariffs imposed on agricultural, manufactured and primary products. The empirical analysis indicate that liberalising the manufacturing and primary product sectors will boost intra-ECOWAS trade while in the case of the agricultural sector we find otherwise in some models. Nonetheless our finding also makes a case for reducing restrictions in the agricultural sector. Our results also suggest that the role of infrastructure and efficient institutions cannot be downplayed given the critical role they play towards enhancing intra-ECOWAS trade.

The implication of our finding highlight the need for West African countries to reduce and/or eliminate trade restrictions given its importance in a globalised world as cumbersome bureaucratic processes, rigid custom procedures, ineffective port operations and inadequate infrastructure dampen the benefits of regional trade liberalisation. Our robustness test also buttressed the critical role of strengthening domestic institutions and making provision for intra-regional infrastructure. Liberalisation of trade in agricultural and manufactured products should be expeditiously pursued. However concerted efforts need to be made by ECOWAS member countries to ensure that protection is not embedded in long lists of sensitive products. This may douse the worries of domestic producers who may be concerned about increased competition. Suggestions for future research include consideration of tariffs at a more disaggregated level and use of non-tariff barriers. Also, increasing the sample size (time and country) could also improve the reliability of findings and will aid conducting sensitivity analysis with respect to subsample of countries and distinct periods.

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**Appendix**

**Table 1: Intra-ECOWAS Export Flows (1980-2009) US$ Millions**

| Country | 1980-84 | 1985-89 | 1990-94 | 1995-99 | 2000-03 | 2005-2009 |
|---|---|---|---|---|---|---|
| Benin | 1.30 | 2.04 | 3.05 | 3.40 | 2.70 | 4.30 |
| Burkina Faso | 4.30 | 4.49 | 4.94 | 4.94 | 5.87 | 7.47 |
| Cote d'Ivoire | 61.25 | 78.42 | 125.5 | 164.31 | 175.82 | 186.30 |
| Gambia | 2.56 | 1.03 | 1.84 | 0.50 | 0.08 | 3.01 |
| Ghana | 5.87 | 4.55 | 23.61 | 19.82 | 27.35 | 37.32 |
| Guinea | 0.37 | 0.51 | 1.22 | 0.79 | 0.47 | 2.50 |
| Mali | 8.01 | 6.29 | 2.12 | 1.46 | 1.72 | 2.45 |
| Niger | 11.16 | 4.75 | 11.30 | 12.02 | 15.20 | 18.31 |
| Nigeria | 72.29 | 68.58 | 130.73 | 187.87 | 265.45 | 373.54 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Senegal | 17.20 | 16.92 | 16.39 | 25.47 | 33.17 | 52.18 |
| Sierra Leone | 0.08 | 0.02 | 0.00 | 0.00 | 0.23 | 3.21 |
| Togo | 7.56 | 3.76 | 7.86 | 5.14 | 22.13 | 45.21 |

*Source: Computed from statistics contained in the IMF Direction of Trade and Statistics and The World Bank's World Integrated Trade System (WiTs)*

### Table 2: ECOWAS Common External Tariffs

| Categories | Duty Rate (%) | Goods Description |
|---|---|---|
| 0 | 0% | Essential social goods. |
| 1 | 5% | Goods of primary necessity, raw materials and specific inputs. |
| 2 | 10% | Intermediate goods. |
| 3 | 20% | Final Consumption goods. |

### Table 3: Variable Description and Sources of Data

| s/n | Acronym | Definition | Description | Source |
|---|---|---|---|---|
| 1 | RGDP | Real gross domestic product | US dollar | The World Bank's World Development Indicators (WDIs) |
| 2 | EXR | Nominal exchange rate | Local currency unit per US dollar | The World Bank's World Development Indicators (WDIs) |
| 3 | POP | Population | Total number of people in a country | The World Bank's World Development Indicators (WDIs) |
| 4 | OPEN | Openness | Sum of exports and imports divide by GDP (computed) | The World Bank's World Development Indicators (WDIs) |
| 5 | RER | Real exchange rate | Local currency unit per US dollar deplated by domestic prices (computed) | The World Bank's World Development Indicators (WDIs) |
| 6 | COMLANG | Language | Dummy variable: 1 for english- | Values assigned |

| | | | | |
|---|---|---|---|---|
| | | | speaking, 0 otherwise | |
| 7 | DIST | Geographical Distance | Distance between country of origin and destination | Index developed by Mayer and Zignago (2006) |
| 8 | INTRA | Trade between selected ECOWAS countries, showing origin and destination | Total trade between country (i) and (j) in US dollar | The World Bank and World Trade Organisation's World integrated trade system (WiTs) |
| 9 | ATRAP | Applied tariff rates on all products | Percentage (%) | The World Bank and World Trade Organisation's World integrated trade system (WiTs) |
| 10 | ATRMP | Applied tariff rates on manufactured products | Percentage (%) | The World Bank and World Trade Organisation's World integrated trade system (WiTs) |
| 11 | ATRPP | Applied tariff rates on primary products | Percentage (%) | The World Bank and World Trade Organisation's World integrated trade system (WiTs) |
| 12 | MFNTRAP | Most favoured nation tariff rate on all products | Percentage (%) | The World Bank and World Trade Organisation's World integrated trade system (WiTs) |
| 13 | MFNTRMP | Most favoured nation tariff rate on | Percentage (%) | The World Bank and World Trade Organisation's World integrated |

| | | manufactured products | | trade system (WiTs) |
|---|---|---|---|---|
| 14 | MFNTRPP | Most favoured nation tariff rate on primary products | Percentage (%) | The World Bank and World Trade Organisation's World integrated trade system (WiTs) |
| 15 | TELE | Telephone | Fixed and mobile phone users per 100 inhabitants | The World Bank's World Development Indicators (WDIs) |
| 16 | INTERNET | Internet | Internet users per 100 inhabitants | The World Bank's World Development Indicators (WDIs) |
| 17 | ROLEST | Rule of law estimate | Estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance) | The World Bank's World Governance Indicators (WGIs) |
| 18 | COCEST | Control of corruption estimate | Estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance) | The World Bank's World Governance Indicators (WGIs) |