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An Evaluation of Intra-Trade Potential in Economic Community of West African States (ECOWAS)

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Abstract

Single currency for West Africa countries has been revered as the solution to a great deal of the sub region's problems. Attentions of past and present government have been the champion of the introduction of single currency. Top of the reason for the proposed adoption of single currency is to improve intra regional trade. The study employs the gravity model in panel Dynamic Ordinary Least Square (DOLS) to empirically investigate the size of intra-trade potential within West Africa within the gravity model framework. It examines bilateral potential in ECOWAS using time series data from 1980 to 2010. The study observed substantial intra-trade potential between the two monetary unions. The study recommends that ECOWAS diversify its export base and deepen integration not only economic but cultural to improve intra-trade.

Keywords: Gravity model, Intraregional trade, Trade potential

1. Introduction

Regional economic integration, which is an agreement among neighbouring countries to allow for the free flow of ideas, investment funds, technology, goods and services, and free movement of persons within the region in which a single large market exists with the benefits of comparative advantage and economies of scale has gained momentum partly as a strategy to cope with global economic problems and partly to enhance domestic economic growth and development. As many countries are not strong enough on their own to cope with the rapid changes in the global economy, groups of countries use regional integration to achieve the necessary conditions for sustainable growth and development. West Africa is no exception to these strategies.

West African countries have a long-standing tradition of gathering into groups whose institutional objective is to foster cooperation and economic integration. ECOWAS, the Economic Community of West African States, was founded in 1975 to promote a regional-based scheme of development in West Africa, through the creation of a common trade market and the adoption of macroeconomic policies enabling a sustained development. In particular its mission is to promote economic integration in "all fields of economic activity, particularly industry, transport, telecommunications, energy, agriculture, natural resources, commerce, monetary and financial questions, social and cultural matters.

The above mentioned goals should be achieved through the implementation of a free trade area and a custom union (elimination of custom duties, quantitative and administrative restrictions to trade; establishment of a common external tariff), the creation of a common market (elimination of all obstacles to the free movement of persons, capital and services), and the creation of an economic union (harmonisation of economic, agricultural industrial and monetary policies, establishment of a fund for cooperation and development).

ECOWAS for the past three decade has made important steps towards the achievement of these goals: tariffs on intra regional trade have been consistently reduced. Free movement of designated goods, reduction of custom duties and ECOWAS passport / travelling documents have also been adopted. The achievement of free movement of labour is still far from being completed although some steps have been made also in this direction. Within ECOWAS, WAEMU - West African Economic and Monetary Union – gathers Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo. Its external exchange rate is pegged to the euro and is guaranteed by the French Treasury. In April 2000, The Gambia, Ghana, Guinea, Nigeria, and Sierra Leone announced their intent to create the West African Monetary Zone (WAMZ). The antecedents to this are not new as West Africa has had a history of two monetary unions: the former British colonies of The Gambia, Ghana, Nigeria and Sierra Leone had the West African Currency Board, which had the sole responsibility of issuing currency in these countries. The currency board existed from 1912 until the establishment of formal central banks after independence, from the late 1950s to early 1960. The goal is to merge with WAEMU, giving West Africa a single stable currency. This is in line with the two track approach to integration in the sub-region agreed in 1999 by Heads of State and Government of ECOWAS member states held in Lome, Togo. The pursuit of

regional integration trace its roots from a desire to minimise the cost of trade between member countries and facilitate market access and growth for the region's industries, as well as to strengthen the economic power of the combined member states vis-`a-vis third parties. For Africa, integration is also a developmental necessity in relation to trade, economic performance and strengthening of policy credibility and effectiveness. With organisational and institutional initiatives towards regional integration, there is scope to increase intra-regional trade, develop regional infrastructure, improve administrative efficiency, facilitate higher levels of investment and industrialisation and reduce political contamination of macroeconomic policies.

Trade has always been a major component of the economic development of nations (see for instance, Krueger 1990, Grossman and Helpman 1990). One of the major economic objectives of ECOWAS as noted has been the promotion of intra-trade through the creation of a custom union. This has yield positive results with share of intra-ECOWAS trade increased consistently from 3% in 1970 to almost 11% in 2008, which is not different from those of other African Regional Trade Agreements such as COMESA and SADC (WDI,2010). However the level of integration is far below that of the Europe whose intra-trade share is about 60% thanks to a significant reduction in trade costs as result of the introduction of the single currency (Balwin, 2008). The study by De Nardis, De Santis and Vicarelli (2008) have also provided enough evidence of EU intra-trade positive response to the introduction of the Euro. This has given various trade blocs the hope and need for single currency. The road to trade integration has been slow in the West Africa. Trade liberalisation gained momentum in nineties with the WAEMU countries revising Cotonou Treaty. Besides the devaluation of the CFA Franc in 1994 with the aim of boosting regional integration and policy effectiveness, made a decisive step towards stronger trade integration by creating a custom union. The non-WAEMU however pursued a looser form of trade integration. The WAEMU custom union has been strengthened through the removal of tariffs and quantitative restrictions on intra-regional trade creating a free trade area and adopted a common external tariff creating effectively a custom union. The level of intra-regional trade in WAEMU is higher than in any other region in Africa. Moreover the slow but steady progresses in implementing trade liberalisation in the region attracted other ECOWAS countries to join the process both for reaping the benefits of higher trade and for avoiding to be penalised by the trade diversion effect that is embedded in any free trade area. Trade between WAEMU and ECOWAS countries has been subjected to substantial trade barriers. Goods imported from ECOWAS were subject to the common WAEMU external tariff; by contrast exports from WAEMU to ECOWAS were subject to country specific import tariffs. It worth noted that these and other several factors are constraining its effective implementation: bureaucratic customs and inspection procedures, corruption, inappropriate taxation, lack of sub-regional harmonisation of the national regulatory frameworks, and intense competition from outside the region.

In view of these challenges, the ambition of the ECOWAS leadership had been to significantly improve the rate of intra-regional trade in the long term through creation of currency union to reduce transaction cost and impact of exchange rate volatility.

In April 2000, The Gambia, Ghana, Guinea, Nigeria, and Sierra Leone announced their intent to create the West African Monetary Zone (WAMZ) with intention of merging with eight West African countries (Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo) that are members of the West African Economic and Monetary Union (WAEMU) to facilitate the integration.

However, the region is constraint by both legal and policy framework which includes high tariff barriers, bureaucratic customs and inspection procedures, corruption, inappropriate taxation, lack of sub-regional harmonisation of the national regulatory frameworks, intense competition from outside the region and homogeneity of exports (United Nations Economic Commission for Africa(UNECA), 2010). Specifically, low export diversification index has been cited as the major cause of low intra-West Africa trade (Odularu, 2009). A glance through export concentration index presented in Table 1 shows that ECOWAS export is highly concentrated given credence to the earlier literature. The export concentration in the ECOWAS, which is 69.36 from 2006-2009 is only comparable to the CEMAC export concentration index of 78.07. An examination of import and export structure of ECOWAS reveals that its export is concentrated on primary commodities (see Table 2). The bloc exports more than three times of primary commodities as compared to those imported and import more than six times the volume of manufactured goods exported. However, the manufactured goods accounts for more than 65% of ECOWAS total import raising doubt as to whether these country can meaningful trade among themselves.

The basic theory of economics posits that meaningful trade can only take place when there is coincidence of wants. The relevance of the common currency to intra-trade hinges on existence of unexhausted intra-trade potential within the ECOWAS bloc otherwise the cost of trade within the bloc may lower but level of intra-trade which is paramount will remain same. Similar concern had been expressed by Ogunkola (1998) which lead to the evaluation of trade potential in the ECOWAS. The study investigated trade potential of individual countries with ECOWAS bloc which failed to revealed the inter-countries potential within the bloc. Recognising the importance knowledge of individual trade potential with other individual countries for policy formulation especially as they gear for the currency union and failure for previous studies in dealing with the issues; this study therefore seeks to explore the intra-trade potential among the ECOWAS members.

The study contributes to the general body of knowledge by filling the void in the academic literature in several ways. The study explores both intra-country trade potential within ECOWAS and intra-ECOWAS trade potential using gravity model which is missing in the literature. The existing estimated intra-ECOWAS trade potential by Ogunkola (1998) failed to deal with endogenous in gravity model estimation which casts doubt on the magnitude of the parameter estimates. It is rare for single cross-section survey to provide sufficient information about the earlier times and aggregate time series data have possibility that underlying dynamics may be obscured by aggregation biases (Bond, 2002; Shepherd, 2008). The current study employs dynamic panel estimation which addresses the controls for unobserved heterogeneity among cross sectional units.

The rest of the study is organised as follows; section two looks at the literature review, methodology and Data at section three. The section takes the results and concludes at section five.

Table 1. Export Trade Concentration Index of various Trade Blocs(1995-2009)

Trade Bloc	Export product concentration index	Export product concentration index	Export product concentration index	Export product concentration index
	1995-1999	2000-2004	2005-2008	2006-2009
Arab Common Market	57.88	62.28	59.72	56
ASEAN	20.05	20.72	18.86	21.05
CACM	28.44	21.40	20.88	16.99
CARICOM	37.80	42.37	45.55	43.63
CEFTA	15.30	16.63	14.54	14.38
CEMAC	63.69	72.45	76.63	78.07
COMESA	44.02	46.93	46.76	43.60
EAC	32.13	30.94	27.74	28.23
ECOWAS	75.45	75.67	68.85	69.36
EU27	8.95	10.18	9.85	24.89
NAFTA	9.54	9.68	9.21	9.75
SAARC	17.12	16.17	16.84	9.35
SADC	32.87	34	35.04	35.33
UEMOA	40.53	41.15	40.07	42.28

Source: UNCTAD, 2011

Table 2. Structure of ECOWAS Commodity Export and Import, 2010

Commodity Classification	Export/ Import	% of Total Import
SITC 0+1+2+3+4+68+667+971	3.55	33
SITC 0+1+2+3+4+68	3.45	33
SITC 0+1+2+4+68	1.42	21
SITC 3	6.76	13
SITC 5+8 less 667 and 68	0.15	65

Source: Calculated from UNCTAD-WDI Statistics, 2011

2. Literature Review

There issue of intraregional trade have been an important part of the academic for number of decades resulting in number of works from number of regional blocs trade potential such as the Intra-ECOWAS (Ogunkola,1998), European Union (Martínez-Galán,Fontoura and Proença,2005)), South Asia (Wadhaw, 2009), sub-Saharan Africa (Keane, Calì and Kennan ,2010), Southern Africa (Simwaka,2010; Haggblade, Jayne, Tschirley, and Longabaugh, 2008) and Africa (UNECA, 2010). The empirical evaluation of intra-regional, Africa in particular have been slightly vary, the general conclusion seems to be similar. They all conclude that the experience of regional integration in Africa has been a failure in achieving its objectives of increasing intra-regional trade in particular and fostering policy coordination in general. The studies might have suffered from aggregate biases as they have looked at regional level potential and failed to look at intra-country level trade potential within the zone. In terms of methodology, the analyses of all empirical literature have been based on the gravity model. The gravity model has been derived from Newton's "Law of Universal Gravitation", which states that the force of attraction between two objects is a function of the masses of the objects and the distance between the two objects. Tinbergen (1962) proposed to apply Newton's law to international trade flows to study the effect of economic factors on trade changes. He used economic forces of the origin and destination countries, and economic forces that affect trade flows between the two sets of countries to study the determinants of international trade flows. Thus the model predicts that bilateral trade between a pair of countries should increase as their economic sizes increase and decrease as the transaction costs increase. The model can be expressed as follows:

$$T_{ij} = G\frac{M_i M_j}{D_{ij}} \tag{1.2}$$

Where

T_{ij} = trade flows from origin country i to destination country j ; usually it is expressed as a country's exports, imports or total trade value.

M_i and M_j = the economic forces of the two countries that have a positive effect on bilateral trade flows.

D_{ij} = the economic force that negatively affects trade flows between the origin country and the destination country; it is usually represents changes in transaction costs.

G =constant.

The assumption is that the economic size of a trading country usually decides how much a country can trade with all its trading partners. Therefore, larger countries tend to trade more, while smaller countries tend to trade less.

Previous literature justifies the role of GDP in the gravity model and GDP is found to positively affect a country's trade flows (Anderson 1979; Bergstrand 1989).

According to Deardorff (1998), theoretical justification for the gravity model under international trade theories has been gradually strengthened since the 1990s. It has been found that the gravity equation is consistent with international trade theories based on traditional Heckscher-Ohlin model (H-O model) or imperfect competition trade theories. Assuming identical homothetic preferences for commodities across countries and different trade shares in each country, Anderson (1979) theoretically justified the gravity model using the expenditure function to study differentiated traded goods in a group of countries, and relaxing many assumptions from the Cobb-Douglas production function.

Bergstrand (1985) theoretically justifies the gravity model in a microeconomic foundation from a general equilibrium framework by setting up a world trade general equilibrium model from supply and demand sides based on the assumption of a single factor for each trading partner. Bergstrand (1989) extending his earlier work in 1985 based on a microeconomic foundation. He employs trading partners' per capita income to represent a country's factor endowment level and taste preference to test whether the gravity model is in line with the Heckscher-Ohlin model and Linder hypothesis.

Varying models stemming from different general frameworks including monopolistic competition models as well as product differentiation models have been developed. Deardoff (1998) and Anderson and van Wincoop (2003) have also justified theoretically the gravity by assuming that each country is specialized in a single good. This probably closes the curtain of the theoretical foundation of the gravity model.

3. Methodology and Data

3.1 The Gravity Model

The model developed here is the variant of Sousa and Lochard (2003). The model start from the utility of a representative consumer in country i, which is assumed to be

$$U_i = \left(\sum_j \beta_j^{\frac{-\alpha}{\alpha+1}} q_{ij}^{\frac{\alpha}{\alpha+1}} \right)^{\frac{\alpha+1}{\alpha}} \tag{3.1}$$

Where q_{ij} is the consumption by country i consumers of goods from country j and $\alpha > 0$ the elasticity of substitution between goods. The consumers in country i maximise their utility subject to the subject constraint

$$Y = \sum_j p_i q_{ij} \tag{3.2}$$

With Y_i the income of country i and p_{ij} the price of good from country j for consumers in country i. Assuming that trade costs are borne by seller and take the 'iceberg' form, the price received by seller in j be

$$p_{ij} = p_i c_{ij} \tag{3.3}$$

Where c_{ij} is the cost of trade. Assuming an iceberg form for trade costs amounts to suppose that each good transported from country j to country i, a proportion $c_{ij} - 1$ "melt" in transit. The result of the consumer utility maximization problem is:

$$q_{ij} = \frac{1}{p_{ij}} Y_i \left(\frac{(\beta_j p_{ij})^{-\alpha^2}}{\sum (\beta_j p_{ij})^{-\alpha}} \right)^{-\frac{1}{\alpha}} \tag{3.4}$$

Therefore, the value of import of country i from country j is given by:

$$M_{ij} = Y_i \left(\frac{p_i}{\beta_j p_j c_{ij}} \right)^{\alpha} \tag{3.5}$$

It is decreasing in c_{ij} if $\alpha > 0$. The market clearing condition implies that the exporter j income is income is equal to the importer i spending:

$$Y_j = \sum_i M_{ij} = \sum_i Y_i \left(\frac{p_i}{\beta_j p_j c_{ij}} \right)^{\alpha} \tag{3.6}$$

From equation (6) we obtain the equilibrium scaled prices:

$$(\beta_j p_j)^{\alpha} = \frac{1}{Y_j} \sum_i Y_i \left(\frac{p_{ij}}{c_{ij}} \right)^{\alpha} \tag{3.7}$$

Combining equation (5) and equation (7) gives

$$M_{ij} = \left(\frac{Y_i^{\frac{1}{\alpha}} Y_j^{\frac{1}{\alpha}}}{c_{ij}} \right)^{\alpha} \frac{P^{\alpha}}{\sum Y_i \left(\frac{p_{ij}}{c_{ij}} \right)^{\alpha}} \tag{3.8}$$

We can rewrite equation (8) as

$$M_{ij} = G\left(\frac{Y_i^{\frac{1}{\alpha}} Y_j^{\frac{1}{\alpha}}}{c_{ij}}\right)^{\alpha} \tag{3.9}$$

$$\text{Where} \quad G = \frac{P^{\alpha}}{\sum Y_i \left(\frac{p_{ij}}{c_{ij}}\right)^{\alpha}} \tag{3.10}$$

$$\text{Let} \quad \ln c = f(\ln d_{ij}^{\sigma}, ED_i^{\rho}, ED_j^{\upsilon}) \tag{3.11}$$

Taking logarithm of equation and substitute equation (10) gives

$$\ln M_{ij,t} = \lambda_1 + \lambda_2 \ln Y_{i,t} + \lambda_3 \ln Y_{j,t} + \lambda_4 \ln d_{ij} + \lambda_5 \ln ED_i + \lambda_5 \ln ED_j + \varepsilon_t \tag{3.12}$$

Where M_{ij} is the volume of bilateral trade between country i and country j

Y_i, Y_j is the GDP of country i and county j

d_{ij} is the trade barrier between country i and county j

ED_j is export concentration index of partner countries

ED_i is export concentration of the host country

ε_t is the error term

The propose model for this study takes the form (3.11) to estimate the intra-trade determinant.

3.2 ECOWAS Intra-Trade Potential

Intra-ECOWAS trade potential is analysed using the model estimates from the previous section to predict trade, with rest of the countries in the sample. The ratio of trade as predicted by the model (P_X) to actual/observed trade (A_X), (P_X / A_X) is then used to analyze the future direction of trade for ECOWAS. If the value of (P_X / A_X) for a country exceeds one, it implies a potential for expansion of trade with that particular country exist.

3.3 Estimation Technique

Since the data considered vary both over time and across countries, the study considered panel estimation that takes time series properties of the data into consideration. This brings the problem of stationarity in econometrics studies. Empirical studies show that most of the time series are not stationary. That is, their mean and variances depend on time. As econometric theory shows, when the variables are non-stationary, the standard ordinary least squares cannot be applied because there might be a spurious regression which affects forecasting performance.

A number of methods are suggested to solve this problem. One of them is taking the differences of the series and then putting them into regressions. However, in this case we are confronted with a new problem; loss of information that is important for the long-run equilibrium. As long as the first differences of the variables are used, determining a potential long-run relationship between these variables becomes impossible. Cointegration has become preferred method estimation time series data because of the weakness of the standard OLS. However, it has been widely acknowledged that standard unit root and cointegration tests can have low power against stationary alternatives. Panel tests make progress in this respect. Since the time series dimension is extended by the cross section, inference relies on a broader information set. Therefore, gains in power are expected, and more reliable evidence can be obtained.

Kao (1999), and Pedroni (1999, 2004) proposed panel cointegration tests similar to the Engle and Granger (1987) framework, which includes testing the stationarity of the residuals from a levels regression. The present study employed Kao(1999)[1] ADF test to detect the presence of panel cointegration. Since these tests only detect the presence of cointegration but do not estimate the long run relationship, appropriate method should be employed. In this direction Pedroni (2000) proposes fully modified ordinary least square (FMOLS) estimation while Mark and Sul (2001) recommend the dynamic ordinary least squares (DOLS) as alternative methods of panel cointegration estimation. FMOLS estimation corrects for endogeneity and serial correlation to the OLS estimator. To correct for the endogeneity bias and to obtain an unbiased estimator of the long-run parameters, DOLS uses a parametric adjustment to the errors by augmenting the static regression with leads, lags, and contemporaneous values of the regressors in first differences. Both FMOLS and DOLS provide consistent estimates of standard errors that can be used for inference. According to Kao and Chiang (2000), FMOLS and DOLS estimators have normal limiting properties, and the DOLS estimator outperforms the FMOLS estimator especially in small samples. On the basis of the earlier findings in favour of panel DOLS estimation, the DOLS method is used to estimate long-run cointegration equation which relates direct intra-trade after identifying the panel cointegration relation with Kao-ADF test. In the DOLS framework, the long run regression is augmented by lead and lagged differences of the explanatory variables to control for endogeneous feedback (Saikkonen,1991). Lead and lagged differences of the dependent variable can be

[1] See Camareroy & Tamarit (2002) for strength and weakness of the test.

included to account for serial correlation (see Stock and Watson, 1993). In particular, the equation

$$Z = \alpha + X'\beta + \sum_{i=-p}^{p} \gamma \Delta X_{t+i} + \mu_t$$

Where p is the lag length within a relevant range to determine by some information criterion (AIC, BIC). Equation (5) is the DOLS regression. The DOLS specification removes the unit root component from the regression by simply adding leads and lags of the first difference of the explanatory variables to the OLS regression

3.4 Data Collection

The data for this study is secondary data covering a period of 31 years (1980-2010). The study uses annual bilateral trade, GDP data and other social and economic indicators of 15 ECOWAS countries (Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo). These data were obtained from International Monetary Fund -Direction of trade (IMF-DOT)/International Financial Statistics (IMF-IFS) database, United Nation Conference on Trade and Development (UNCTAD), UNCOMTRADE database and World Trade Organisation (WTO). The necessary transformation is done to avoid possible spurious regression. All the variables used in the study entered in as natural logarithm. The zeros in the bilateral trade were corrected using the ad hoc method by adding small positive number (0.00001) to all trade flows. Though the approach has no theoretical basis but is approximate at best and is commonly used in the policy literature (Shepherd,2009)

4. Estimation Results

As required for econometric analysis, stationarity/non-stationarity properties of the time series variables were examined, using the available unit root tests for both individual data series and pooled (panel) data sets The Augmented Dickey-Fuller (ADF) test, the Phillips-Perron (PP) test, the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) test were conducted on the 256 individual data series and the Levin, Lin and Chu test (2002), the Im, Pesaran and Shin test (2003), the Breitung test (2000) and the Hadri test (2000) were employed for test cross-sectional independent panel unit root tests. The results generally observed nonstationarity in the datasets[2]. Also Chow poolability test was conducted for the appropriateness of pooling the cross-section parameters as against individual models and results gave evidence of efficiency in pooling the cross-section parameters against individual regression[3].

Table 3 presents Kao (1999) Panel Cointegration test while Table 4 presents the panel DOLS estimates of gravity models for all the country. Table 3 shows that the null hypothesis of no cointegration is failed to be accepted indicating the presence with cointegration relationship among the variables under consideration. The panel estimates with each of the countries'

[2] The units root results are not reported because of the size but is available on request.
[3] The results is available on request

bilateral trade flow with the rest of ECOWAS countries generally fit the data well and explain 45.1% and 99.6% of the variation in bilateral trade across our sample of countries. The variables are also generally correctly signed. The distance is negative and significant in all the countries. The GDP variables for host and partner countries are all positive and significant except for Mali which is significant negative and then Niger and Nigeria which are both positive but insignificant. The implications are that economic expansion is good for bilateral trade in ECOWAS and distance or barriers impede bilateral trade. This is consistent with trade literature. The trade facilitation indicator, exports concentration of host country and partner country shows negative and significant effect on most of the countries. This lend credence to Odularu(2009) and UNECA(2010) claim that the problem of ECOWAS and Africa as whole is homogeneity of export.

Table 3. Kao (1999) Panel Cointegration Test

		B	BF	CD	CV	GA	GH	GU	GB	LB	M	N	NG	SG	SL	TG
ADF	T-stat	-3.58	-4.29	-3.59	-5.46	-2.63	-6.00	-3.28	-1.69	-2.44	-2.48	-1.61	-3.28	-3.98	-2.26	-2.40
	Prob.	0.005 **	0.000 **	0.000 **	0.000 **	0.004 **	0.000 **	0.001 **	0.045 **	0.007 **	0.006 **	0.05 4*	0.001 **	0.000 **	0.012 **	0.008 **

B-Benin, BF-Burkina Faso, CV-Cape Verde, CD-Cote d'Ivoire, GA-Gambia, GH-Ghana, GU-Guinea, GB-Guinea Bissau, LB-Liberia, M-Mali, N-Niger, NG-Nigeria, SG-Senegal, SL-Sierra Leone, TG-Togo

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Table 4. DOLS Panel Cointegration of Gravity Model

	Regressors					Diagnostic Statistics	
Host Counry(i)	GDP_i	GDP_j	Distance	EDI	EDJ	Adjusted R^2	D-W stats
Benin	2.303*	1.796*	-2.836*	1.649*	-4.802*	0.996	2.019
Burkina Faso	2.36*	4.571*	-6.807*	24.550*	-12.820*	0.813	1.958
Cape Verde	3.156*	3.519*	-5.980*	18.907*		0.535	2.047
Cote D'Ivoire	2.007*	0.936*	-1.249*	-1.422*	-0.265*	0.990	2.090
Gambia, The	3.901*	1.488*	-4.037*	0.530	0.0787	0.796	1.933
Ghana	1.621*	2.601*	-3.207*	-13.530*	-6.675	0.888	1.967
Guinea	2.172*	1.362*	-2.381*	-7.312*	-3.705*	0.970	1.973
Guinea Bissau	3.929*	1.566*	-4.641*	-4.129*	-14.342*	0.451	1.937
Liberia	2.252*	1.521*	-2.329*	-1.164	-6.046*	0.588	1.990
Mali	-2.335*	5.744*	-2.952*	5.703*	-14.661*	0.997	2.045
Niger	0.048	3.461*	-2.498*	0.0914	-8.386*	0.997	1.978
Nigeria	-4.03	2.764*	-0.2081	5.687*	1.377*	0.982	1.976
Senegal	1.618*	0.835*	-0.629*	-0.3082	1.6304	0.983	2.043
Sierra leone	0.287	3.340*	-3.517*	9.029*	-16.398*	0.886	1.960
Togo	0.606*	2.199*	-1.331*	-3.179*	-0.632	0.863	2.028

Source: Athour's Calculation, 2012

4.1 Intra-ECOWAS Trade Potential

Having estimated the gravity model for bilateral trade flows for ECOWAS countries, we proceed to estimate intra-ECOWAS trade potential. The model estimates from the previous section are used to predict intra-ECOWAS trade among the countries. The ratio of trade potential (P) as predicted by the model to the actual trade (A); that is, (P/A) is then used to analyze the future direction of trade for intra-ECOWAS countries. If the value of P/A exceeds one, the implication is in terms of potential expansion of trade with the respective country. Table 5 give the intra-trade potential in ECOWAS. The estimate shows each country's potential with each of the ECOWAS country. The result put forth argument which looks bit confusing but that is the case. The trade potential of country say A with B is not true for the reverse because of difference in bilateral trade reported by each country. This is due to discrepancies in recording of bilateral trade between trading partners as a result of timing of export/import, shipping & insurance cost, classification of goods, re-export, partner country attribution & treatment of processing trade, mis-invoicing, transfer pricing & mis-attribution and smuggling.

The study therefore presents trade potential of each country based on the reported trade with partners in ECOWAS. The potential of more than 1000 times the current trade is classified as a green field which need to be exploited and is represented by "-". The results presented in Table 5 shows a considerable trade potential within the region. There is huge potential between WAEMU countries and WAMZ countries indicating existence of trade barrier between the two blocs within ECOWAS. The low trade potential between WAEMU countries were initially attributed to common currency of CFA franc but WAMZ countries also have low trade potential (see Tables 5 and 6). A critical look at the trade potential within the WAEMU shows Guinea Bissau seems to have high trade potential with most of the countries raising the issue of colonial experience which have been recorded in the literature as a determinant of intra-trade because Guinea Bissau is the only Portuguese country in the zone.

Table 5. Intra-ECOWAS Trade Potential Estimates

	B	BF	CV	CD	GA	GH	GU	GB	LB	M	N	NG	SG	SL	TG
B		0.16	-	0.93	-	46.82	1.07	-	2.79	0.21	0.08	299	0.12	-	1.96
BF	0.11		-	0.38	-	0.18	-	9.12	6.25	0.11	0.65	830	0.79	-	1.14
CV	983	-		0.20	0.38	-	-	0.20	727	-	-	3.47	0.38	-	-
CD	1.33	0.79	2.26		0.64	1.87	1.22	3.75	0.71	0.90	1.36	0.96	0.82	1.77	0.91
GA	0.29	-	9.82	0.20		0.204	2.62	1.89	0.20	0.63	-	5.94	3.05	0.26	0.33
GH	1.10	0.35	-	1.41	0.20		0.59	-	0.21	47.2	0.28	16.86	0.27	0.33	1.55
GU	1.97	-	-	0.22	0.73	0.73		2.36	0.32	1.98	6.79	0.73	0.35	7.21	0.39
GB	938	-	0.23	0.20	0.24	-	0.47		-	-	-	-	0.21	0.20	-
LB	0.51	-	-	0.21	0.22	0.35	1.14	0.20		-	-	0.32	0.21	0.24	0.26
M	0.25	0.20	-	0.46	20.20	24.44	0.50	-	-		0.20	0.21	0.21	-	0.20
N	0.33	1.67	-	1.83	-	1.25	-	-	-	0.95		16.3	0.76	-	0.27
NG	0.87	16.87	5.34	1.18	29.88	0.62	1.71	-	0.48	11.89	1.35		0.79	3.23	0.367
SG	0.98	1.88	4.0	0.66	0.635	2.60	1.25	0.60	1.55	0.37	6.58	0.86		4.46	0.73
SL	-	-	-	0.20	0.20	0.20	0.83	-	0.20	-	704	1.92	0.20		-
TG	0.54	0.43	-	1.64	0.64	2.18	3.15	-	0.25	0.38	0.21	130	0.42	-	

****B-Benin, BF-Burkina Faso, CV-Cape Verde, CD-Cote d'Ivoire, GA-Gambia, GH-Ghana, GU-Guinea, GB-Guinea Bissau, LB-Liberia, M-Mali, N-Niger, NG-Nigeria, SG-Senegal, SL-Sierra Leone, TG-Togo**

Source: Author's Estimate, 2012

Table 6. Intra-WAEMU Trade Potential

	B	BF	CD	GB	M	N	SG	TG
B		0.16	0.93	-	0.21	0.08	0.12	1.96
BF	0.11		0.38	9.12	0.11	0.65	0.79	1.14
CD	1.33	0.79		3.75	0.90	1.36	0.82	0.91
GB	938	-	0.20		-	-	0.21	-
B	0.51	-	0.21	0.20	-	-	0.21	0.26
M	0.25	0.20	0.46	-		0.20	0.21	0.20
N	0.33	1.67	1.83	-	0.95		0.76	0.27
SG	0.98	1.88	0.66	0.60	0.37	6.58		0.73
TG	0.54	0.43	1.64	-	0.38	0.21	0.42	

Source: Author's Estimate, 2012

Table 7. Intra-WAMZ trade Potential

	GA	GH	GU	LB	NG	SL
GA		0.204	2.62	0.20	5.94	0.26
GH	0.20		0.59	0.21	16.86	0.33
GU	0.73	0.73		0.32	0.73	7.21
LB	0.22	0.35	1.14		0.32	0.24
NG	29.88	0.62	1.71	0.48		3.23
SL	0.20	0.20	0.83	0.20	1.92	

Source: Author's Estimate, 2012

5. Conclusion

In this paper, we have estimated the intra-trade potential in ECOWAS using gravity model. A panel data for the year 1980 to 2010 has been analyzed using the Panel DOLS estimation technique. The study finds evidence of high un-exhausted intra-trade potential in ECOWAS which mainly exist between WAEMU and Non-WAEMU Countries given suspicion of existence of trade barriers but low trade potential within the WAEMU and WAMZ. The high trade potential of Guinea Bissau with the rest of WAEMU countries raises question of whether currency union is the key to diminished intra-trade potential within WAEMU. It should be noted that Guinea Bissau is the only Portuguese colonised country in the WAEMU zone and is coincidentally has high trade potential raising the issue of language or colonial effect which needs to be looked at. The study further identified export diversification as a key to trade expansion in ECOWAS.

The study recommends that integration of the two blocs is very important for intra-trade promotion including policies of tariff harmonisation and cultural especially language should be pursued. Further export diversification is required to expand intra-trade among countries with exhausted trade potential.

References

Andersen, P. G. (1993). The 45-Rule Revisited, *Applied Economics*, *25*(10), 1279-1284. http://dx.doi.org/10.1080/00036849300000093

Anderson, J. E., & van Wincoop, E. (2003) Gravity with Gravitas: A Solution to the Border Puzzle. *American Economic Review*, *93*(1), 170-192. http://dx.doi.org/10.1257/000282803321455214

Anderson, K. (ed.). (2004). *The World's Wine Market: Globalization at Work*, Edward Elgar Publishing Limited, London.

Baldwin, R., DeNino V., Fontagne L., De Santis R., & Taglioni D. (2008). Study on the Impact of the Euro on Trade and Foreign Invetsmtent, European Economy Economic Papers no. 321, May, Directorate General for Economic and Financial Affairs, European Commission, Brussels.

Bergstrand, J. H. (1990). The Heckscher-Ohlin-Samuelson Model, The Linder Hypothesis and the Determinants of Bilateral Intra-Industry Trade. *The Economic Journal*, *100*(403), 1216-1229. http://dx.doi.org/10.2307/2233969

Bergstrand, Jeffrey H. (1985). The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence. *The Review of Economics and Statistics*, *67*(3), 474-81. http://dx.doi.org/10.2307/1925976

Bergstrand, Jeffrey H. (1989). The Generalized Gravity Equation, Monopolistic Competition, and the Factor-Proportions Theory in International Trade. *The Review of Economics and Statistics*, *71*(1), 143-53. http://dx.doi.org/10.2307/1928061

Bond, S. (2002). Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice. *Cemmap working paper CWP09/02*

Breitung, J. (2000). The Local Power of Some Unit Root Tests for Panel Data. *Advancesin Econometrics*, *15*, 161-177. http://dx.doi.org/10.1016/S0731-9053(00)15006-6

De Nardis, S., De Santis R., & Vicarelli C. (2008) The Single Currency's Effects on Eurozone Sectoral Trade: Winners and Losers? *Economics Discussion Papers*, n.2008-1.

Deardorff, A. V (1998). Technology, Trade, and Increasing Inequality: Does the Cause Matter for the Cure? *Journal of International Economic Law*, *1*(3), 353-76. Oxford University Press.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive, *Journal of the American Statistical Association*, 74(366), 427-431.

Engle, R. F., & Granger, C. W. J. (1987). Co-Integration and Error Correction: Representation, Estimation, and Testing. *Econometrica*, *55*(2), 251-276. http://dx.doi.org/10.2307/1913236

Grossman, G. M., & Helpman, E. (1990). *Innovation and growth in the global economy*. Cambridge, MA: MIT Press.

Hadri, K. (2000). Test for Stationarity in heterogenous Panel Data. *Econometrics.*

Haggblade, S, Jayne, T. S., Tschirley, D. L., & Longabaugh, S. (2008). Potential for Intra-Regional Maize Trade in Southern Africa: an Analysis for Zambia at the Sub-National Level, Food Security Collaborative Working Papers 54494, Michigan State University, Department of Agricultural, Food, and Resource Economics.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for Unit Roots in Heterogeneous Panels. *Journal of Econometrics, 115*, 53-74. http://dx.doi.org/10.1016/S0304-4076(03)00092-7

Kao, C. (1999). Spurious Regression and Residual-based Tests for Cointegration in Panel Data, *Journal of Econometrics*, *90*, 144. http://dx.doi.org/10.1016/S0304-4076(98)00023-2

Keane, J, Calì M., & Kennan, J. (2010). Impediments to intra-regional trade in sub-Saharan Africa, Overseas Development Institute

Krugman, P. R., & Venables, A. J. (1990), Integration and the Competitiveness of Peripheral Industry,' in C. Bliss and J. B. de Macedo (eds.), Unit with Diversity in the European Economy: The Community's Southern Frontier, Cambridge University Press, Cambridge.

Levin, A., Lin, C.-F., & Chu, C.-S. J. (2002). Unit Root Test in Panel Data: Asymptotic and Finite Sample Properties. *Journal of Econometrics, 108*(1), 1-25.

Mark, N.C., & Sul, D. (1999). A computationally simple cointegration vector estimator for panel data. Mimeo, Ohio State University

Martínez-Galán, E, Fontoura M-P, & Proença,I (2005). Trade Potential in an Enlarged European Union: A recent Aproach, 0508011, EconWPA.

Odularu, G. O. (2009) Export diversification as a promotion strategy for intra-ECOWAS trade expansion. *African Journal of Business Management, 3*(2), 032-038

Pedroni, P. (1999). Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors. *Oxford Bulletin of Economics and Statistics*, *61*, 653-70. http://dx.doi.org/10.1111/1468-0084.61.s1.14

Pedroni, P. (2004). Panel Cointegration; Asymptotic and Finite Sample Properties of Pooled Time Series Tests with an Application to the PPP Hypothesis, *Econometric Theory*, 20, 597-625. http://dx.doi.org/10.1017/S0266466604203073

Phillips, P. C. B., & Perron, P. (1988). Testing for a Unit Root in Time Series Regression. *Biometrika, 75(2), 335-346.* http://dx.doi.org/10.1093/biomet/75.2.335

Shepherd, B. (2009). *Behind the Border" Gravity Modeling*, Asia-Pacific Research and Training Network on Trade, United Nations Economic and Social Commission for Asia and the Pacific (ESCAP).

Simwaka, K., (2010) An Empirical Evaluation of Trade Potential in Southern African Development Community 15894, University Library of Munich, Germany.

Tinbergen, J. (1962) *Shaping the World Economy: Suggestions for an International Economic Policy*. New York: The Twentieth Century Fund. The first use of a gravity model to analyze international trade flows.

Wadhwa, D. (2009). Assessing the Potential for Growth of Intraregional Trade in South Asia, Studies in Trade and Investment, in: *Challenges and Opportunities for Trade and Financial Integration in Asia and the Pacific, 67*, 36-65. United Nations Economic and Social Commission for Asia and the Pacific (ESCAP).