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Trade creation and trade diversion in West African Monetary Zone (WAMZ)

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Abstract

This paper estimates the trade effects of WAMZ between 2005 and 2010 using the gravity model. In addition, it also estimates the determinants of bilateral trade flows in WAMZ countries. The paper finds that WAMZ has been trade diverting although country specific analysis reveals that individual countries in the RTA do not necessarily exhibit similar trends as Nigeria and Gambia are export creating while Ghana and Guinea are export diverting. It also finds that economic size, geographical factors and political stability are significant determinants of WAMZ's bilateral trade. Therefore, regional policies in WAMZ should be more directed towards promoting initiatives that will enhance extra and intra-WAMZ trade by the appropriate authorities.

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1.0 Introduction

The proliferation of RTAs around the World has been associated with myriad reasons but the most important for developing economies is to promote sustainable regional development and facilitate the attainment of non-economic goals like conflict prevention and resolution. In West Africa, different forms of these RTAs have been adopted ranging from a free trade agreement (FTA) as in the Economic Community for West African States (ECOWAS) which includes 15 countries to monetary and custom union like the West African Economic and Monetary Union (WAEMU or UEMOA) which comprises eight francophone countries. The third and much younger RTA is the West African Monetary Zone (WAMZ) which is an anglophone dominated monetary union with six countries as members. The ultimate plan however is for both monetary unions to establish a common currency (*the ECO*) for the ECOWAS region as a whole.

While a number of studies have examined the level of intra-regional trade in ECOWAS and WAEMU (Musila, 2005; Agboji, 2008; and Coulibaly, 2009, among others), very little is known about the trade effects of WAMZ. This trend may be underscored by the fact that the development of the RTA is quite recent and it is not presently a well developed monetary and currency union. In fact, after previous efforts had hit the rocks, the adoption of a common currency is not expected to hold until the year 2015 mainly because of lack of economic convergence among member countries which include Nigeria, Ghana, Guinea, the Gambia, Liberia and Sierra Leone.

Apart from the major macroeconomic requirements expected of members which include but are not limited to, a threshold of deficit to GDP ratio, single digit inflation rate and a secured level of reserves, another important yardstick necessary for the success of a monetary union is a high level of trade among parties to such agreements especially as this consequently results in increased employment and output. In fact, the intensity of trade linkages determines the level of monetary policy externality (which is a pre-requisite for a successful monetary and currency union) and a high level of monetary policy externality can only be achieved by improved intra-RTA trade (see Debrun et al., 2005).

Recently, different studies have been carried out to evaluate the effect of the formation of RTAs on intra-regional trade. While some studies have examined trade flows, trade potentials and prospects in other regions of the world (see Kepaptsoglou et al., 2010 for a comprehensive review) and in Africa (see Cassim, 2001 and Musila, 2005), some have attempted to understand the determinants and predict the formation of regional trade agreements (RTAs) (see for example, Baier and Bergstrand, 2004 and Jayathilaka and Keembiyahetti, 2009)

Also, apart from studies that have attempted to advance the methodology used in modeling international bilateral trade like Baier and Bergstrand (2004), Carerre (2006), Baier and Bergstrand (2007), Martinez-Zarzoso et al. (2009) to mention but a few, in the past decade, a relatively larger number of studies have focused on investigating the impact of RTAs on regional trade and welfare especially in terms of their tendency to divert or create trade (see Ghosh and Yamarik, 2004; Carrere, 2006; Baier and Bergstrand, 2007; Jugurnath et al., 2007 and Martinez-Zarzoso et al., 2009).

However, owing to the paucity of literature on the determinants of WAMZ bilateral trade and its trade creation and diversion effects, the present study seeks to contribute to the literature in two

ways. First, it examines the determinants of bilateral trade flows in WAMZ. Second, it examines the presence of trade diversion and trade creation effects associated with the formation of WAMZ in the ECOWAS region. Most studies interested in trade creation or diversion effects in the literature follow the Vinerian-type specification (Carrere, 2006; Jugurnath et al., 2007 and Martinez-Zarzoso et al., 2009; among others for example). However, in the present study, we adopt a more recent specification as in Kelejian et al. (2012) because it is more compact and insightful.

The paper finds that WAMZ as a prospective monetary and currency union has not only been trade diverting but is also outward looking in terms of trade within the ECOWAS region. This, perhaps, suggests that member countries of WAMZ are not natural trading partners; therefore, are not likely to increase their bilateral trade even after the formation of the union. Nonetheless, the paper also finds that the traditional gravity variables (that is income and distance), the sharing of a common border, common language and political stability are significant determinants of bilateral trade flows in WAMZ.

This paper is organised as follows. Section 2 specifies the empirical models employed in this paper while the discussion of the estimation technique and results are presented in section 3. Section 4 concludes the paper with policy recommendations.

2.0 Model Specification

In line with the main thrust of this study, two gravity models are specified and estimated. Following the previous literature (see for example, Longo and Sekkat, 2004; Carrere, 2006; Jugurnath et al., 2007 and Athukorala, 2012), the first model is estimated with the aim of examining the determinants of bilateral trade flows in WAMZ. The second incorporates the trade creation and trade diversion effects associated with WAMZ in West Africa following a procedure similar to those of Kelejian et al. (2012). The following equations are thus estimated;

$$\ln EXPORT_{ijt} = \alpha_0 + \alpha_1 ln\, GDP_{it} + \alpha_2 ln\, GDP_{jt} + \alpha_3 ln\, D_{ijt} + \alpha_4\, BORDER_{ijt} + \alpha_5\, LANGUAGE_{ijt} + \alpha_6 LANDLOCKED_{jt} + \alpha_7 ln\, AREA_{it} + \alpha_8 lnAREA_{jt} + \alpha_9 ln\, INFRA_{it} + \alpha_{10}\, lnINFRA_{jt} + \alpha_{11}\, lnECOPOL_{it} + \alpha_{12} ln\, ECOPOL_{jt} + \alpha_{13}\, POLSTAB_{it} + \alpha_{14}\, POLSTAB_{jt} + V_{ijt} \ldots\ldots\ldots (equation\ 1)$$

The dummies for border and language take the value of one if the trading partners share a common border or common language and zero otherwise. The dummy variables in addition to the bilateral distance represent the country-pair characteristics which have been validated in the literature as important determinants of bilateral trade. The rest of the variables in the model capture country specific characteristics for the countries included in the gravity framework. The infrastructure variable is computed as an average of road length per capita and number of telephones per capita while the political stability index is obtained from World Governance Indicators. The economic policy variable used is the flow of FDI into the country as this is believed to reflect, to a large extent, the level of confidence of rational investors on the economy. The variable *AREA* denotes the country's total land area, including areas under inland bodies of water and some coastal waterways (see Jugurnath *et al.*, 2007)

Theoretical *apriori* expectations dictate that economic size of trading partners is positively related to trade between them so that α_1 and α_2 are expected to be positive. The distance variable

is a proxy for transportation cost and therefore higher distance may imply an increase in transportation cost and consequently a reduction in bilateral trade (so $\alpha_3 < 0$). Countries with a common border and language are expected to trade more with one another based on this level of affinity, so we expect that α_4, $\alpha_5 > 0$. All the WAMZ countries are open to the sea, therefore, we include the landlocked variable for only the importing countries ($i.e. LANDLOCKED_{jt}$) in equation 1 to examine the impact of this on WAMZ countries' trade with landlocked trading partners. Countries that are landlocked find it more laborious and expensive to trade because of their lack of accessibility to markets, so α_6 is expected to be negative. Availability of infrastructure and a stable economic policy are expected to promote trade and hence α_9, α_{10}, α_{11} and α_{12} are anticipated to be positive. Political stability is expected to foster trade and therefore we expect α_{13} and α_{14} to be positive. The sign of the coefficient of *area* is indeterminate as revealed by Jugurnath et al., (2007).

In order to examine the trade creation or diversion impacts of WAMZ within ECOWAS, RTA dummies for WAMZ are added to equation 1 above. Therefore, the resulting gravity equation can be specified as below;

$$ln\, EXPORT_{ijt} = THE\ ABOVE\ (as\ in\ equation\ 1) + \alpha_{15}\, WAMZ_{Both} + \alpha_{16}\, WAMZ_{Source} + \alpha_{17}\, WAMZ_{Partner} + \alpha_{18} FORMDUM \ldots\ldots\ldots (equation\ 2)$$

According to Marinez-Zarzoso et al. (2009), the gravity model represents a good counterfactual to identify the effects of an RTA, since it suggests a "normal" level of bilateral trade for a given sample and dummies are used to capture "above or below normal" levels of trade resulting from an RTA. The $WAMZ_{Both}$ takes the value of 1 if both exporting and importing countries are members of the same RTA and 0 otherwise. In other words, this dummy captures how intra-WAMZ export has changed (i.e. how far is it above or below the normal level?) as a result of its formation. Therefore, a positive coefficient of $WAMZ_{Both}$ (i.e. $\alpha_{15} > 0$) implies that intra-WAMZ export has increased while a negative coefficient implies a decrease. Similarly, $WAMZ_{Source}$ measures how members of $WAMZ$ export to non-members have changed overtime. It takes the value of 1 if the exporting country belongs to $WAMZ$ while the partner country does not at time t and 0 otherwise. Therefore, for $WAMZ$ to be deemed trade creating in terms of export, α_{16} should be positive; otherwise, it implies that export to non-members of $WAMZ$ has reduced as a result of the formation of WAMZ. A similar interpretation can be given to the coefficient of $WAMZ_{Partner}$ (i.e. α_{17}) which examines how export from non-members of $WAMZ$ to members has changed overtime (i.e. how far is it above or below the normal level?).

To capture the actual effect of the formation of WAMZ on trade, there is need to make provision for the trade that existed between trading partners before it was formed in the year 2000.[1] We include the $FORMDUM$ dummy which takes the value of 1 for periods before the formation of WAMZ (i.e. 1995 to 1999) and 0 for periods after the formation (i.e. 2001 to 2010).

Data used for the empirical analyses were obtained from the following sources:

(1) Bilateral Export and Import: **UNCTADSTAT (2011)**: Merchandise trade by partner and product, 1995-2010. Find data at:
(2) http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx.

[1] See Martinez-Zarzoso et al. (2009) for more details on the multilateral resistance effect.

(3) GDP, Infrastructure and Economic Policy and Total land area: **WDI (2011)**: World Bank.
(4) Bilateral distances, Common (official) language, Border: **CEPII distance database** (http://www.cepii.fr/anglaisgraph/bdd/distances.htm).
(5) Political Stability/ No Violence Index: **World Governance Indicators (2011).**

3.0 Estimation Technique and Results

Table 2 shows the result of the regression estimations carried out. We employ the Least Square Dummy Variable (LSDV) approach of fixed effects to estimate models 1 and 2. The LSDV approach is relevant in this case as it allows for the inclusion of dummy variables to capture both the country specific and country pair characteristics. Ignoring these specific effects when in fact they exist in the trade model may lead to biased results and misleading inferences (see for example, Baltagi, Egger and Pfaffermayr, 2003 and Carrere, 2006). In order to espouse the presence of both import and export trade diversion/creation effects, we examine two variants of equation 3. The first uses bilateral export as the dependent variable while the second uses bilateral import as the dependent variable. We use data for the period 1995 to 2010 covering 11 West African Countries (which includes Benin, Burkina Faso, Cote-d'Ivoire, Mali, Niger, Senegal, Togo, Gambia, Ghana, Ginuea and Nigeria) with the WAMZ countries serving as the source or exporting country in the analysis.[2]

In the second column of Table 2, which depicts the result for equation 1, the coefficient of determination of the estimation is about 60 percent and a good number of variables are found to be significant determinants of bilateral trade flows of WAMZ countries. Therefore, we interpret only these significant coefficients. Our result, in terms of the signs of the traditional determinants of trade, conforms to those found in the literature (see Longo and Sekkat, 2004; Musila, 2005; Carrere, 2006; Jugurnath et al., 2007; Agboji, 2008, and Martinez-Zarzoso et al., 2009; among others) even though they differ in magnitudes. The elasticity coefficient of GDP for the exporting country is about 0.9 implying that a 1 percent increase in the GDP of WAMZ countries will on the average increase bilateral trade of WAMZ countries by just about 0.9 percent. Again, even though this elasticity coefficient is positive as found in the literature, it is less than proportionate. This result implies that expanding the economic size of WAMZ countries is required to promote bilateral trade of the region. The result does not differ when the effect of the economic size of WAMZ trading partners in ECOWAS is considered.

For distance, it met apriori expectation with a negative significant elasticity coefficient of about 1.6. This means that, on the average, a 1 percent increase in bilateral distance between WAMZ countries and their trading partners in the ECOWAS region will result into about 1.6 percent decrease in trade. In other words, efforts at increasing the economic size of WAMZ countries and reducing the cost of transporting goods from WAMZ countries to other countries in ECOWAS will significantly increase intra-regional trade.

Other variables that were found to significantly affect bilateral trade in WAMZ countries include the sharing of a common border and common language, landlockedness of the trading partner, economic policy and the level of political stability in the source or exporting country. Of course,

[2] Other countries in the ECOWAS region (i.e. Sierra Leone, Liberia, Guinea Bissau and Cape Verde) were excluded because of lack of sufficient data as most of them faced problems of social unrest for a long period. However, we are confident that their exclusion will not significantly affect the estimation results as these countries have relatively small contributions to the region.

sharing a common border and having a common language promote trade through the effect they have on proximity and affinity of trading partner. It is not surprising therefore that they are usually seen as major determinants of bilateral trade in most trade literature including the findings of this study. The landlocked coefficient for the partner country of about -0.78 implies that the magnitude of bilateral trade in WAMZ countries is reduced by about two times (i.e. $\boldsymbol{e}^{0.78}$) relative to the absence of such feature. This conforms to expectations as it is more costly to trade with landlocked countries than those open to the sea.

Like other studies (including Longo and Sekkat, 2004), our result has revealed that favorable economic policy and political stability play important roles in facilitating bilateral trade, especially in Africa. Precisely, our result reveals that the presence of political stability in WAMZ countries increases their bilateral trade over and above its normal level compared to the presence of instability.

In the third column of Table 2, we present the result for equation 3 above. The coefficients of all the RTA dummies are significant. The coefficient of intra-WAMZ export is negative. This suggests that for the period 2005 to 2010, intra-WAMZ export has reduced beyond the normal level despite the formation of WAMZ. In other words, members have reduced their export to their fellow WAMZ members within the period of the study. In a similar fashion, since the coefficient of extra-WAMZ export is also negative, we can infer that export from WAMZ members to non-members within the ECOWAS region has also reduced over the scope of the study. This is a case of export diversion. However, since intra-WAMZ export has not also increased despite this diversion, it suggests that WAMZ members have been more outward looking (i.e. away from fellow ECOWAS members) than inward looking in terms of export trade. Table 1 below further reinforces our findings as it provides statistics on WAMZ member country's share of intra-ECOWAS export, import and total trade for different period averages. The table reveals that apart from Nigeria which exports mainly crude oil, other WAMZ members contribute relatively little or insignificantly to intra-ECOWAS export. In fact, the shares of Guinea and Gambia remain below 0.5 percent for the entire period.[3]

To make our analysis holistic and prevent a case of hasty generalization, we extend our analysis to include the extent of import creation or diversion effect of WAMZ. The result as shown in the fourth column of Table 2 further strengthens our position that WAMZ is an outward looking RTA in the ECOWAS region. Both intra-WAMZ import and WAMZ import from non-WAMZ are empirically shown to have reduced from 2005 to 2010. In other words, there has been a decrease in WAMZ members' import from both fellow members and non-members within the ECOWAS region. This is a case of trade diversion (i.e. in terms of import). Again, Table 1 corroborates the estimated results. Summarily, our analysis reveals that WAMZ is both a trade diverting and an outward looking RTA. This is indeed is clear evidence of the fact that WAMZ member countries are not natural trading partners.

Also, the coefficient of the FORMDUM dummy in equation 3 is significant and positive. The implication of this is that there is a significant difference between trade before and after the formation of WAMZ. In fact, the positive coefficient of FORDUM implies that bilateral trade between WAMZ members reduced after the formation of the RTA. Despite making provision for

[3] In fact, Nigeria's main export in ECOWAS is crude oil. In terms of other export produce to the region, the country's performance is not significantly different from other WAMZ countries.

the multilateral resistance effect, the result and conclusion of the study does not differ from when such provision is not made. A comparison of Table 2 and Appendix 1 reveals this evidence.

Table 1: Percentage Share of ECOWAS Countries in Intra-regional trade (1995 - 2010)

Country	Periods	BEN	BFA	CIV	GHA	GMB	GIN	MLI	NER	NGA	SEN	TGO
	1995-2000	1.9	2.1	34.7	4.2	0.0	0.3	6.1	4.5	36.2	6.7	3.3
	2001-2005	4.1	3.5	30.8	4.3	0.0	0.4	1.9	2.5	36.9	7.9	7.7
Export Share	**2006-2010**	4.9	1.8	28.1	6.5	0.0	0.3	1.8	3.0	39.6	8.5	5.6
	1995-2000	5.2	8.7	23.0	18.5	1.2	3.6	12.4	4.5	9.8	8.7	4.5
	2001-2005	5.2	9.7	22.4	18.8	0.8	2.6	12.0	4.1	9.8	10.8	3.8
Import Share	**2006-2010**	6.1	8.6	24.4	20.5	0.7	1.1	13.0	4.0	12.7	7.6	1.4
	1995-2000	3.5	5.2	29.2	11.0	0.6	1.9	9.1	4.5	23.7	7.6	3.8
	2001-2005	4.6	6.5	26.8	11.3	0.4	1.5	6.8	3.3	23.8	9.3	5.8
Share in Total	**2006-2010**	5.5	5.1	26.3	13.4	0.3	0.7	7.3	3.5	26.4	8.1	3.5

Source: Authors' Computation from UNCTADSTAT, 2011

Note: The ISO Codes have been used to name countries above. Therefore, BEN – Benin, BFA – Burkina Faso, CIV – Cote D'Ivoire, GHA – Ghana, GMB – Gambia, GIN – Guinea, MLI – Mali, NER – Niger, NGA – Nigeria, SEN – Senegal, TGO - Togo

Table 2: Regression Estimation Results for Equation 1 and Equation 2.

Explanatory Variables	Equation 1 with basic gravity variables only	Model 2 with RTA dummies (where bilateral export is the dependent variable)	Model 2 with RTA dummies (where bilateral import is the dependent variable)
GDP Source	0.90***	0.90***	0.61***
	(9.02)	*(11.89)*	*(7.48)*
GDP Partner	0.38***	0.48***	0.67***
	(3.77)	*(6.34)*	*(8.29)*
Common Language	1.07***	-0.37	-0.47
	(3.24)	*(-0.87)*	*(-0.99)*
Bilateral Distance	-1.63***	-1.21***	-1.23***
	(-5.29)	*(-4.28)*	*(-3.89)*
Common Border	0.74*	1.09***	0.87*
	(*1.63)*	*(2.71)*	*(1.92)*
Land Area Source	0.29*	-	-
	(1.72)	-	-
Land Area Partner	0.60***	-	-
	(3.18)	-	-
Landlocked Partner	-0.78*	-	-
	(-1.66)	-	-
Economic Policy Source	0.10***	0.07***	0.02
	(0.30)	*(2.57)*	*(0.64)*
Economic Policy Partner	0.02	-0.01	0.08***
	(0.81)	*(-0.19)*	*(2.72)*
Political Stability Source	0.13**	0.11	0.05
	(1.96)	*(1.63)*	*(0.73)*
Political Stability Partner	0.11*	0.11	0.12*
	(1.77)	*(1.61)*	*(1.79)*
Infrastructure Source	0.02	0.04	-0.17
	(0.12)	*(0.34)*	*(-1.24)*
Infrastructure Partner	0.14	-0.11	0.07
	(0.82)	*(-0.87)*	*(0.54)*
WAMZ Both	-	-2.01***	--1.11*
		(-3.57)	*(-1.89)*
WAMZ Source	-	-2.77***	-1.27**
		(-5.69)	*(-2.32)*
WAMZ Partner	-	-1.38***	-1.75***
		(-2.83)	*(-3.19)*
Formation Dummy	-	0.21***	0.25***
R^2	0.60	0.65	0.55
No. of observations	1760	1760	1760

Source: Authors' Computation. Note: The z-statistics for the coefficients are in italics and bracket below them. *, **, *** represent 10%, 5% and 1% levels of statistical significance respectively.

4.0 Policy Implication and Conclusion

Evidently, a high level of intra-regional trade has been noted to be another important requisite for a monetary and currency union to ultimately succeed at its implementation phase. The reason for this cannot be unconnected with the fact that such unions, given their peculiar nature, will require a channel through which they can transfer positive monetary externalities to their members in a bid to stabilize their structure in the event of a shock. Consequently therefore, with the use of a modified gravity model, we have attempted to examine whether members will benefit more from the formation of a currency union in WAMZ. We find that members of WAMZ are not natural trading partners and therefore are not likely to benefit from the formation of a common currency union.

We find that a number of factors including economic factors, geographical factors and political stability have the potentiality of influencing the level of bilateral trade in WAMZ. Also, geographical factors like distance and landlockedness of some countries have been found to inhibit trade. While this is not surprising considering the insufficiency and dilapidating level of infrastructure in the region (like cross border road and railway networks) and the presence of red-tape barriers to trade especially in ports among others, we are of the opinion that these problems can be controlled. This can be done by providing certain dedicated routes and ports to landlocked countries through their close neighbors that are opened to the sea and significantly improving the level of infrastructure in the region.

Just like recent events validate, perhaps there is no other problem more inhibiting to growth in ECOWAS and WAMZ in particular than political instability. This is particularly evident in WAMZ countries like Liberia and Sierra Leone and more recently Nigeria. In fact, there is hardly any country in the region that has successfully overcome problems relating to the different variants of political instability ranging from ethnic conflicts to terrorist attacks since independence. It is not surprising therefore that our result re-iterates the aforementioned. Therefore, we recommend that more commitments from all stakeholders are required to prevent and offer prompt resolution of conflict and political instability in the region. For WAMZ in particular, a stable monetary union cannot be achieved without political stability in the region.

The fact that WAMZ as a whole is not trade creating raises a high level of concern especially for the viability of the preferential trade agreement. This concern is further aggravated by the fact that countries in the RTA appear to be more outward looking than inward. Therefore, we recommend that caution should be exercised before the formation of WAMZ to prevent a monetary union crisis in West Africa in the near future.

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Appendix 1: Regression Estimation Results for Equation 2 without Formation dummy.

Explanatory Variables	**Model 2 with RTA dummies (where bilateral export is the dependent variable)**	**Model 2 with RTA dummies (where bilateral import is the dependent variable)**
GDP Source	0.92***	0.64***
	(12.32)	*(7.92)*
GDP Partner	0.50***	0.71***
	(6.72)	*(8.78)*
Common Language	-0.35	-0.44
	(0.83)	*(-0.94)*
Bilateral Distance	-1.22***	-1.25***
	(-4.36)	*(-3.98)*
Common Border	1.07***	0.84*
	(2.66)	*(1.86)*
Land Area Source	-	-
	-	-
Land Area Partner	-	-
	-	-
Landlocked Partner	-	-
	-	-
Economic Policy Source	0.09***	0.01
	(3.17)	*(0.62)*
Economic Policy Partner	0.01	0.10***
	(0.37)	*(3.41)*
Political Stability Source	0.08	0.02
	(1.27)	*(0.32)*
Political Stability Partner	0.08	0.09
	(1.26)	*(1.36)*
Infrastructure Source	0.04	-0.17
	(0.34)	*(-1.28)*
Infrastructure Partner	-0.11	0.07
	(-0.89)	*(0.54)*
WAMZ Both	-2.08***	--1.19*
	(-3.70)	*(-1.89)*
WAMZ Source	-2.80***	-1.29**
	(-5.76)	*(-2.36)*
WAMZ Partner	-1.40***	-1.78***
	(-2.88)	*(-3.26)*
R^2	0.66	0.56
No. of observations	1760	1760

Source: Authors' Computation.
Note: The z-statistics for the coefficients are in italics and bracket below them. *, **, *** represent 10%, 5% and 1% levels of statistical significance respectively.