Determinants of Bilateral Trade Performance of the Member Countries of the West African Monetary Zone (WAMZ)

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Abstract

This study sought to identify the drivers of import demand in the region, as a basis for proposing achievable alternative strategies for enhancing the level of intra-regional trade in the Zone. The study estimated a global import trade model for the Zone to establish the key determinants of its import demand. Using the pooled regression technique, the study analysed quarterly data spanning the period 1985 to 2012, for the five original member countries of the WAMZ. The following is a highlight of the outcome of the analyses: given its positive sign and significance, trade liberalisation has the potential of boosting intra-regional trade and improving the welfare of the citizens; nominal exchange rate is a significant factor in the demand for imports in the Zone; its significance and negative sign show that exchange rate movements have negative impact on bilateral intra-WAMZ trade, with implications for incurring avoidable foreign exchange transaction costs; positive signs of both domestic and foreign economic growth proxy variable (GDP) indicated that economic growth in the Zone, as well as its foreign trading partners, is generally accompanied by increase in the demand for import by members. Based on these findings, the study recommended, among others, that policy-makers in the Zone should de-emphasise individual exchange controls in favour of adopting a common exchange rate mechanism as a way of reducing transaction costs associated with trading with each other through a third party currency.

Key Words: *International Trade, Regional Economic Integration, Panel Data, Pooled, Regression WAMZ***.**

I.   Introduction

The traditional global approach to the promotion of trade between the developed and developing nations has been to foster trade agreements, which aim to create trading opportunities for developing nations through trade policies that discriminate in their favour. This strategy gave rise to such agreements as the Lome Convention, which was signed in 1975 between seventy-one members of the Africa, Caribbean and Pacific countries (ACP) on the one hand and the European Community (EU) on the other. This convention sought to give preference to the ACP countries in their trade relations with the EU.

Much as there was some success under this strategy, emphasis is now shifting away from such agreements or treaties. The current trend is to promote trade by

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encouraging states, especially contigual ones, to come together in the form of economic blocks or enter into Regional Trade Agreements (RTAs). Recent partnership agreements between Europe and the ACP, as well as those between the latter and the United States of America, have shifted focus away from discriminatory and preferential trade arrangements to encourage regional economic integration.

The main objective of this strategy is to consciously encourage trade diversion from the rest of the world to the integrating block. This objective, among others, forms the rationale for formation of economic blocks in most regions of the world. The West African Monetary Zone (WAMZ), which is the brain child of the Economic Community of West African States (ECOWAS), is a fast track initiative to regional economic integration. The WAMZ, comprising The Gambia, Ghana, Guinea, Nigeria, Sierra Leone and the new addition, Liberia seeks to expedite the evolution of a second monetary zone in West Africa. The rising global trend in RTAs stems from the fact that regional economic integration galvanises economic activity and ultimately increases the level of trade among the participating countries (Rose, 2000; Mason and Pattillo, 2004).

Considerable time and resources have been expended over time to improve the level of trade among the member countries of the WAMZ. Indeed, serious effort to achieve higher levels of intra-regional trade in the West African sub-region has been on-going since the signing of the ECOWAS Treaty in 1975, and the establishment of the Economic Community of West African States (ECOWAS). Over this period, a number of protocols have been signed aimed at facilitating and liberalising trade in the sub-region. However, despite the time and effort spent in this regard, the level of intra-WAMZ trade has remained low. According to Bamidele (2003), the level of intra-regional trade in the ECOWAS region has hovered around 10.9 and 11.4 per cent respectively, thereby trailing other regions. Thus, although the member countries of the WAMZ may be witnessing increases in their global trade, they are certainly doing very little with one another. This poor performance has been attributed to a number of factors including, lack of commitment to the ideals of the group, non-implementation of trade liberalisation protocols, lack of awareness, non-tariff barriers and other political and technical factors (Ogunkola and Jerome, 2005).

The West African Monetary Zone (WAMZ) was established in the year 2000, under the Bamako Treaty. Its primary mandate is to create the enabling environment that would galvanise the ECOWAS sub-region to achieve a monetary union. The original participating countries were the Gambia, Ghana, Guinea, Nigeria and

Sierra Leone, until February 2010 when Liberia was admitted. The WAMZ was, however, still a monetary zone under construction, the ultimate objective of which is to create a common central bank and a common currency for what would become the second monetary zone in West Africa.

The Zone has faced a number of challenges that have hindered trade among members. Principal among these challenges is the fact that members do not have a common convertible currency. They therefore continue to trade through third currencies. It is also a fact that differences in languages is also impacting negatively on trade and this is reinforced by traditional colonial alliances that seem to favour trade with colonial masters at the expense of members. As a result, there is a large and rising amount of informal trade going on in the sub-region and threatening formal trade. Other constraints to the growth of intra-regional trade in the Zone include ineffective trade liberalisation policy. The trade liberalisation scheme that was introduced in 1990 has not been effectively implemented (Ogunkola and Jerome, 2005).

Import dependence, which is one of the major hindrances to economic growth in the Zone, has its origin in the immediate post-independence Import-Substitution Industrialization (ISI) strategy, widely adopted by the founding fathers of the Zone (Ahmed, 1983). The legacy of this development strategy, which is still with us, is highlighted by industrial sectors that are not only shallow, but also highly reliant on imported input. Thus, we have a situation where import-substitution activity ends up fuelling more importation. According to Okongwu (1984), import substitution will always result in increased importation. This view is in tandem with one earlier expressed by Ahmed (1983) who observed that it was mounting imports, in the face of unstable export performance, that partly explained the overall adverse external sector performance of these countries in the 1980s, especially Nigeria. Consequently, a large proportion of their foreign exchange earnings is spent on the importation of a wide range of goods and services, including raw materials, plant and machinery and consumables, such as drinks, soaps, tooth paste and fruit juices. This awkward situation, according to Vogel and Wagner (2008), is the natural consequence of a flawed industrial development with heavy dependence on imported input.

There has also been considerable study of import demand using the trade gravity model, which tries to capture the influence of economic power in trade relations. The trade gravity model is typically specified with the product of the real GDP of the two countries both in levels and also in per capita terms. Also included in the arguments are: the distance between them, their land masses; and a number of

dummy variables, which seek to capture some common characteristics of the two countries. These dummies may include: common language and currency; common borders or adjacency; and common colonising authority (Frankel and Rose, 1998). It has often been argued that Nigeria ought to dominate the sub-regional trade activity given its resource endowment and economic size.

Typically and following Rose (2000) a trade gravity model takes the following form:

$$\ln \left(X_{ij} \right) = B_0 + B_1 \ln \left(y_i y_j \right) + B_2 \ln \left(\frac{y'_i}{Pop_i} \quad \frac{y'_i}{Pop_j} \right)$$

$$+ B_3 \ln \left(Area_i \, Area_j \right) + \sum_{k=1}^{n} B_{3+k} D_k \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 4.6$$

where X_{ij} is the total bilateral (import and export) trade between the two countries.

$y_i y_j$ = Real output of partner countries in U.S dollars

$y'_i y'_j$ = Nominal output of partner countries in U.S dollars

$Pop_i Pop_j$ = Population of partner countries

$Area_i Area_j$ = Land mass of partner countries

D = Dummies; such as: common borders or adjacency, common colonial past and common language (Osuji, 2010).

The broad objective of this study is to determine the key factors that determine intra-regional trade in the Zone. More specifically, the objectives of the study are to examine the extent to which an effective trade liberalisation policy can impact trade among the member countries of the Zone. Furthermore, the study proposes to investigate the extent to which intra-regional trade in the Zone is affected by exchange rate movements, given the absence of a common currency for the Zone. This is with a view to proposing workable strategies to boost trade among the members. The study will also examine the impact of economic growth in major trading partners of the region on her internal trade performance. It therefore focuses on the need to reverse the low level of trade observed among member countries of the WAMZ. It is expected that such solutions would help to galvanise the cooperative endeavours of member countries of the WAMZ and enable them to maximise the benefits of their current economic integration efforts and improve the socio-economic well-being of their citizens.

Accordingly, the paper is organised into five parts. Section I is the introduction, which sets the tone of the study and highlights the challenges at hand. Section II

takes a look at relevant literature to provide background and theoretical foundations for the study. Section III develops the theoretical framework and establishes the methodology of the work. We presented the result of the analysis in Section IV, while Section V contains the conclusions and policy recommendations.

II.   Review of Relevant Literature

The econometric estimation of import demand parameters has been the focus of considerable literature in both developing and developed countries. Such studies include Houthakker and Magee (1969), in which the authors established the superiority of the double logarithmic equation over the simultaneous equation model in the area of international trade. They concluded that even if all countries inflated at the same rate, the trade balance of some would still be subject to secular improvement or deterioration due to disparities in their income elasticities of demand for imports. Frimpong and Oteng-Abayie (2006), established that Ghana's imports in the long- run depended on investments and exports. Similarly, in their study of alternative measures of relative prices in import demand, Goldstein, Khan and Officer (1977), showed that import demand elasticities based on value-added index of tradable goods yields superior price elasticities than those based on unit value indices. In another study of import demand in developing countries, Khan and Schwartz (1974), provided estimates of import and export demand functions for 15 countries that could be characterised as developing. Olopoenia (1991) carried out a study, which related demand for imports to real expenditure and real exchange rate.

Import demand elasticity parameters are very important for planning purposes. They are, especially useful in such areas as the calculation of optimal taxes, tariff reduction and their implications on trade, as well as in exchange rate policy analysis (Hong, 1999). An understanding of the import demand parameters of the WAMZ region will highlight key areas of policy action that would positively impact bilateral trade and hence, improve the level of trade among member countries of the WAMZ.

II.2   Gains from Trade

One of the basic questions that are posed about international trade is why do nations trade with one another or what do they benefit by doing so? This question has long been answered as far back as 1851 in the Ricardian theory of Comparative Advantage, which was developed from the background of Mercantilism. The doctrine of mercantilism was highly nationalistic. It favoured anything that increased the own county's stock of precious metals. It therefore favoured the regulation and planning of economic activity and viewed foreign

trade with suspicion, as it may lead to the dissipation of the nation's stock of gold. As a result, trade had to be controlled and regulated. It was from this environment that Adam Smith and David Ricardo emerged to condemn and confront the status quo with their new perspectives and theories of trade.

The orthodox interpretation of trade as expounded by classical and neoclassical economists is that foreign trade can become a propelling force driving resource allocation and utilisation in the development process. In that regard, trade could become a mechanism for efficient resource allocation and hence act as an engine of growth. That was why Adam Smith's model of foreign trade postulated the existence of idle resources when a country is in the state of autarky. Smith (1776) had stated that a nation would gain from trading by producing more than it needs of the goods in which it has absolute advantage and exchanging the difference for what it does not produce. Thus, resources which otherwise would have been idle are used to produce goods, which international trade "vents" to the outside world thereby creating new jobs and incomes and ultimately improving societal welfare (Mieir, 1984). According to Romer (1986), as the citizens have access to more goods and services, which before trade, were not available to them, welfare gains occur. This is the Absolute Advantage theory of Adam Smith.

On his own part, Ricardo (1817) posited that trade should still go on even if one country has absolute advantage over its counterpart on the production of all goods. According to him, what is important is comparative advantage and not absolute advantage. Thus, countries should specialise in the production of goods in which they have comparative absolute advantage. Country A is said to have comparative advantage over B in the production of a commodity if it has a lower opportunity cost of producing the commodity than country B. It follows therefore that trade occurs because of productivity differentials among countries. This model in which trade takes place solely because of international differences in the productivity of labour is known as the Ricardian trade model. It presupposes that nations should specialise in the production of goods in which they have comparative advantage.

The foregoing classical theory ascribed the occurrence of trade to differences in the productivity of labour among nations and provided an intelligent explanation of the reason why nations trade. However, this view has been challenged by some other group of writers known as the Neoclassical economists, who believe that trade is brought about, not by productivity differentials, but by factor endowments. According to the neoclassical economists, trade results from the fact that different countries are endowed with different levels of natural resources

or technology. They therefore postulate that a country produces goods based on its factor endowment. Some countries have abundance of labour, while others have capital surplus. Countries with technological or capital endowments, according to the theory, will produce capital-intensive goods, while those with the abundance of labour will produce labour-intensive goods. Each country will then import from others what it does not produce. Thus, what determines trade is factor endowment. This is the thesis of the Heckscher-Ohlin trade model.

Both the classical and neoclassical theories of trade suggested that certain gains accrue to trading nations. Such gains include both static gains arising from resource reallocation and dynamic gains, which arise from the outward shift of the production possibility frontiers of trading countries (Cruz, 2008). The export growth that arises from this shift serves as a continuing source of growth, especially where production is subject to increasing returns to scale. Trade also stimulates competition and enhances efficiency.

The more traditional theories of the static gains from trade involve the role of allocative efficiency, which can be achieved more easily with an open trade regime, even when factors of production are assumed to be immobile. It is a basic postulate of the theory of Comparative Advantage that higher levels of output will follow when countries specialise according to their relative comparative advantage. This is clearly complementary to the position of Thirlwall (2003), which is to the effect that the causes which determine the economic progress of nations belong to the study of international trade and specialisation.

II.3   Functional form of Import Demand Equation

Behind the import demand equation is the theory of individual consumption decisions which play an important role in economic activity. Individual preferences are fundamental to consumption decisions. An understanding of how preferences affect demand, and how demand and prices interact, is vital for the analysis of import demand. In a two commodity consumption choice problem involving two goods A and B, there are a number of combinations of goods the individual can consume. To determine the combination preferred by the consumer, we must rank the combinations. Thus, the ranking of various combinations of the goods (X_1, X_2), which might be expressed as index number assignment rule may be written as $U(X_1, X_2)$. This ranking of the various combinations is the individual's utility function. Therefore for any two combinations (X_1^0, X_2^0) and (X_1^*, X_2^*), where $U(X_1^0, X_2^0) > U(X_1^*, X_2^*)$, it means that combination (X_1^0, X_2^0) is preferred to combination $(X_1^*.X_2^*)$. This is the basis of the choice which the individual makes between two baskets of consumption goods. Thus, the maximisation of individual

utility and societal preferences is at the root of the theory of demand, which in its simplest form, assumes that individuals are rational and would allocate their limited resources to maximise their satisfaction.

Although Leamer and Stern (1970) had noted that there are no well-defined criteria for choosing a particular functional specification of the import demand model, this study will draw from the works of Houthakker and Magee (1969), Khan (1974), Egwaikhide (1999), Frimpong and Oteng-Abayie (2006) and, Emran and Shilpi (2001), among others. These authors estimated demand elasticities for both imports and exports for a number of countries, cutting across both the developed and developing world, including the WAMZ.

In studies of import demand, several empirical formulations of the import demand function have been adopted to analyse the relationship between imports and its determinants. According to studies by Frimpong and Oteng-Abayie (2006), Bahman-Oskooee (1984), Goldstein, Mohsin and Officer (1977) and Houthakker and Magee (1969), the simplest formulation of an aggregate import demand function relates the quantity of imports demanded to relative prices (the ratio of import prices to the prices of domestic substitutes), and real income at a given period of time, t. In this formulation, the basic explanatory variables are the price of imports relative to the price of substitutes, and real income. The choice of these variables is rooted in the theory of behaviour and demand with regard to changes in income and the price of goods. From economic theory, the sign of the partial derivative of import with respect to income, $\partial M^d/\partial Y$, is generally expected to be positive, while the partial derivative of imports with respect to relative prices, is expected to be negative. This formulation assumes some level of substitutability (though imperfect) between imports and domestic goods, hence it is referred to as the Imperfect Substitutes Model.

It is noteworthy, however, as Magee (1975) explained, that some ambiguity may arise, with regard to the direction of the partial derivative of imports with respect to income. According to him, depending on whether or not imports are viewed as the difference between domestic consumption and domestic production of importables less export, the outcome of the partial derivative may differ. If income rises and domestic consumption rises faster than domestic output, then import demand will rise, yielding a positive sign for the partial derivative of the income variable. The reverse will be the case if consumption rises more slowly than domestic production as income increases.

Economic theory does not provide *a priori* criteria for choosing the functional form

of the import demand function, according to Leamer and Stern (1970). This choice has been left to the discretion of the researcher. However, from available literature, the most preferred form of the equation has been the log linear form, which was applied by Kreinin (1976), Khan (1974), Magee (1975), Egwaikhide (1999), and Narayan and Narayan (2005), in their various studies. Other empirical works that have utilised the log-linear formulation of the simple import demand model include Boylan, Cuddy, and O'Murrcheartaigh (1979), Ho (2004), and Frimpong and Oteng Abayie (2006).

II.4   Other Empirical Studies

Most of the traditional studies focus on the practical and theoretical importance of price elasticities, which without doubt, is valuable beyond question. However, it has been argued by Chang and Nair (2002) that income elasticities are also at least equally important, especially in developing countries.

Johansen (1988) highlighted the importance of the income elasticity of demand for imports when he noted that under certain conditions, the direction which a country's trade balance follows over time depends, to a large extent, on its income elasticity of demand for imports relative to the world's income elasticity of demand for the country's exports. Johnson further showed that if trade was initially in a balance in a two-country model, with prices held constant and incomes growing at the same rate, the trade balance of the two countries could still change over time, if their income elasticities for each other's exports vary.

According to him, the country with greater income elasticity of demand for its imports, than the foreign income elasticity for her exports, will face more rapid growth in imports and consequently, a deterioration of its balance of trade. This will eventually put pressure on her foreign exchange resources and exchange rate. Thus, a country might experience reasonable income growth while still persisting in balance of trade disequilibrium because the relative income elasticities are sufficiently adverse. The foregoing makes it evident that income and price elasticities have practical and theoretical value in international trade, as well as in economic planning.

Egwaikhide (1999) studied the determinants of import demand in Nigeria. This study examined the determinants of aggregate imports and its major components in Nigeria, covering the period 1953 to 1989. The model specification draws on both the traditional and the Hemphill import demand functions, while the estimation procedures took into consideration the recent developments in time series modeling. The results obtained were very informative. Quantitative evidence

indicated that short-run changes in the availability of foreign exchange earnings, relative prices and real output significantly explained the growth of total imports during the period under investigation. Particularly striking was the short-run impact of foreign exchange availability, which was tied to the long-run effect through a feedback mechanism. Thus, even though these variables all play an important role in sharpening import behaviour, the effect of foreign exchange availability was particularly remarkable.

It follows therefore that to increase total imports, it is essential to implement the set of macroeconomic and sector-specific policies that can considerably relax the binding constraint on the availability of foreign exchange. Moreover, the near unity of the price elasticity of import demand suggested the high sensitivity of demand to the price of imports. In this sense, assuming neutrality of other economic policies, devaluation can reduce the demand for aggregate imports.

The foregoing literature review showed that the essential cause of trade among nations is their individual differences, evident either in terms of labour productivity, resource endowment or economic size. Bilateral trade analysis using the Trade Gravity model has gained considerable prominence in recent literature. The factor of international differences remains a powerful explanation of trade as the literature revealed. It is also clear from the review that exchange rate and national income are central to bilateral trade performance.

III.   Theoretical Framework and Methodology

Following from the studies reviewed in the previous section, particularly the works of Houthakker and Magee (1969), Frimpong and Oteng-Abayie (2006), Khan (1974) and Egwaikhide (1999), which not only focused on areas with similar features as the WAMZ, but also utilised simple and easily adaptable frameworks and models, the theoretical framework for this study is developed. Accordingly, the study adopted the log linear single equation model with appropriate modifications for its analysis. This will enable us to maximally profit from its flexibility and read off relevant elasticities straight from the equations.

III.1   Methodology of the Research

To successfully implement the theoretical framework, the study will estimate a global equation for the intra-regional trade of members. The intra-WAMZ trade model to be estimated in this study focuses on the global import trade of the five original member countries of the Gambia, Ghana, Guinea, Nigeria and Sierra-Leone. These countries have gained considerable experience trying to make the monetary zone a reality. Their trade relations and activities are likely to reflect some

outcome of their many years of economic cooperation than those of non-members. Liberia was a non-member until very recently, hence we believe her structures and systems of trade policy and management are yet to internalise the conduct of an integrating members, hence her exclusion in the present study.

The study estimated an aggregate pooled import demand equation for the combined bilateral imports of the Zone as a whole (Zone-wide Global Intra-WAMZ Import Demand) in which it tries to identify the drivers of bilateral trade among members, using a 5x2 panel.

The construction of the panel will entail a total of ten (10) cross-sectional identifiers, namely Gambia–Ghana (Gam-Gha), Gambia–Guinea (Gam–Gui), Gambia-Nigeria (Gam–Nig) Gambia–Sierra Leone (Gam–Sie), Ghana–Guinea (Gha–Gui), Ghana–Nigeria (Gha–Nig), Ghana–Sierra Leone (Gha–Sie), Guinea–Nigeria (Gui-Nig), Guinea–Sierra Leone (Gui-Sie), and Nigeria–Sierra Leone (Nig-Sie).

III.2   Inclusion of Foreign Trading Partner GDP in the Model

The study hypothesises that imports not only depend on Domestic National Income (GDPD), but also on the level of economic activity, reflected by the GDP, in the foreign representative trading partner country from which the WAMZ imports (GDPF) – the United States of America (the United States).

The major import of the United States from the Zone is oil. Economic growth in the United States would naturally be accompanied by an increase in the demand for oil, which is the main fuel that powers the industrial machinery of the United States. This rise in income will in turn bring about an increase in demand for imports both from the United States and other sources. This will happen for a number of reasons, including the rules of reciprocity in trade that require countries to reciprocate trade. Thus, the theoretical expectation of the partial derivative of imports with respect to changes in foreign partner's GDP is therefore positive.

 The United States having been chosen for the role of representative foreign partner for this study, her GDP shall be included as an explanatory variable in all WAMZ countries' import demand functions. Her long-standing prominent position as a dominant trading partner of the WAMZ members, prior to the recent rise of China, informed the choice of the United States for this role.

III.3   Two Price Terms

While the earlier researchers generally used a single-price term for the relative price variable, this study shall use two-price terms. The price terms will be the unit

value indices for imports (*tPMD*) and exports (*tPMF*). According to Dash (2005) and Shiells (1999), these indices provide a better representation of prices than other variables, such as the ratio of import prices to wholesale prices and the ratio of import prices to GDP (Goldstein, et al., 1977). While providing further justification for the use of unit value indices of import and export as price terms in the import demand equation, Arize and Walker (1992), noted that the approach is better in capturing the reaction of import to its own price as well as the prices of domestically produced competing alternatives.

Two different sets of unit value indices of import and export are available for oil exporting and non-oil exporting countries. The unit values, which apply to non-oil exporting countries, are the same for all such countries. Similarly, the unit values, which apply to oil exporting countries, are the same for all of them. For our purposes, Nigeria is the only country in the oil-exporting category. Thus, when two countries (*i* and *j*) whose bilateral trade is estimated are in the same category (say non-oil exporting countries), the same unit value index of imports (*PMD*) will be used because here $PMD_i = PMD_j$. However, two import prices (*PMDi* and *PMDj*) would be used when the combination of partner countries is such that they are not in the same group (one is oil-exporting and the other is non-oil exporting), because here $PMD_i \neq PMD_j$. This is the International Monetary Fund's classification of countries to oil exporting and non-oil exporting for purposes of the unit value indices.

III.4   Cross Rates in Bilateral Trade
The exchange rate used in the bilateral intra-WAMZ equation was computed as a ratio i.e., *EXRi/EXRj*, which expressed the exchange rates of both countries in terms of their third currency. This cross exchange rate is the ratio of the exchange rate of the currency of country *i* to the US dollar to the exchange rate of the currency of country *j* also to the US dollar.

III.5   Sources of Data Used in Study
The data analysed in this study are secondary time series and cross-sectional data obtained from published statistics of the various countries. The main data sources are the national monetary and statistical authorities of the member countries and WAMZ institutions. These include the National Bureau of Statistics (NBS) of Nigeria and the West African Monetary Institute (WAMI) in Ghana. Other sources include the publications of the ECOWAS Secretariat, the International Financial Statistics and the Direction of Trade Data of the WAMZ Members published by the International Monetary Fund. These foreign statistics were used primarily to augment data from local sources published by the individual countries.

Furthermore, references were made, in the case of Nigeria, to data published in the Nigerian Trade Summary, Annual Abstracts of Statistics, Economic Indicators, Digest of Statistics and, Economic and Financial Review, all published by the NBS. Data from the publications of the West African Monetary Institute and the ECOWAS website were also used to fill appropriate gaps in the statistics of some of the countries, not otherwise available. Some data were also provided by the officials of WAMI, with whom the researcher interacted during the visit to the Institute in Ghana in furtherance of the data collection aspect of the research.

III.6   Data Adjustment: Quarterisation of Annual GDP

The national income figures in the equations are the real gross domestic product (GDP) of the relevant countries. These data came as annual figures and had to be converted to quarterly data. According to Bloem, Dippelsman, and Maehle (2001), several techniques of quarterisation and benchmarking are in use. These techniques include the Pro Rata Distribution Technique, the Basic Extrapolation with an Indicator technique and the Proportional Denton Method. The study utilised the Proportional Denton Method of interpolation of annual flow time series, which is recommended by the World Bank and the International Monetary Fund.

The Basic Version of the Proportional Denton Method keeps the benchmarked series as proportional to the indicator as possible by minimising (in a least-squares sense) the difference in relative adjustment to neighbouring quarters subject to the constraints provided by the annual benchmarks. This method, which is preferred and described by the IMF in its publications as "relatively simple, robust, and well-suited for large-scale application", uses an associated "indicator series", imposing the constraint that the interpolated series obeys the annual totals (Bloem, Dippelsman, and Maehle, 2001). Thus, the sum of the interpolated quarterly figures must equal the annual figure, which served as a benchmark for each year. This technique was applied to the GDP figures of all the five WAMZ countries.

The basic version of the Proportional Denton Method may be expressed as follows:

$$\left(X_t \ldots X_{4,\beta}^{\overset{min}{}} \ldots X_T\right) \sum_{t=2}^{T}\left[\frac{X_t}{I_t} - \frac{X_{t-1}}{I_{t-1}}\right]^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.6.1$$

$$t\varepsilon\left\{1\ldots\left(4\beta\right)\ldots T\right\}$$

under the restriction that, for flow series,

$$\sum_{t=2}^{T}X_t = A_{y,}\ y\ \varepsilon\left\{1 \quad \beta\right\} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.6.2$$

That is, the sum of the quarters should be equal to the annual data for each benchmark year.

where

- t is time (e.g., $t = 4y - 3$ is the first quarter of year y, and $t = 4y$ is the fourth quarter of year y); X_t
- is the derived QNA estimate for quarter t;
- I_t is the level of the indicator for quarter t;
- A_y is the annual data for year y;\
- β is the last year for which an annual benchmark is available; and
- T is the last quarter for which quarterly source data are available.

The proportional Denton technique implicitly constructed from the annual observed BI ratios a time series of quarterly benchmarked QNA estimates-to indicator (quarterly BI) ratios that are as smooth as possible and, in the case of flow series:

- For the back series, $(y \_ \{1...\beta\})$ averages to the annual BI ratios for each year y.
- For the forward series, $(y \_ \{\beta + 1.....\})$ are kept constant and equal to the ratio for the last quarter of the last benchmark year.

III.7   Model Specification for the Global Intra-WAMZ Trade Model
The following implicit model will be specified:

$$TM = f \left(\begin{array}{l} GDPD_i, GDPD_j, GDPF, PMD_i, PMD_j, PMF_i, PMF_j, FR_i, FR_j, \\ EXR_i \Big/ EXR_j, OPEN_i, OPEN_j \end{array} \right) + ... \; \mu...3.7.1$$

and log-linearised as:

    where:

Log (TM)	=	Total bilateral import in U.S dollars
Log ($GDPD$)i	=	Gross domestic product of country in U.S dollars
Log ($GDPD$)j	=	Gross domestic product in U.S dollars of country$j$
Log ($GDPF$)	=	Gross domestic product of foreign trading partner
Log (PMD)i	=	Unit value index of imports for country$i$
Log (PMD)j	=	Unit value index of imports for country$j$
Log (PMF)i	=	Unit value index of exports for country$i$

Log (PFM)j =   Unit value Index of exports for country$j$

Log (FR)i =   Foreign reserve of country I

Log (FR)j =   Foreign reserve of country$j$

Log (EXR)i =   Exchange rate of country I

Log (EXR)j =   Exchange rate of country$j$

$EXRi / EXRj$ =   Cross rate of exchange to the USD of both countries

Log ($OPEN$)ij = $\dfrac{TTMX_i}{GDP_j}, \dfrac{TTMX_j}{GDP_j}$ Index of economic openness or import penetration ratios of countries i and j.

$b1,b2,b3,b4,b5,b6.......b12$ are the elasticity of the relevant variables.

All variables are expressed in log form and all GDP and foreign reserve figures are in U.S dollars.

IV.   Estimation Results

Table1: Zone-Wide Bilateral Intra-WAMZ Model					
Dependent Variable: Total Import [Log (TM)]					
Estimation Method: Pooled Equation Generalized Least Square (Cross Section Weights)					
Sample: 1985Q1 - 2012Q4					
Included Observations: 92					
Cross - Sections Included: 10					
Total Pooled (Balanced) Observations: 920					
Linear Estimation after one-step weighting matrix					
Variable		**Coefficient**		**Statistics**	
Name	Symbol	Name	Value	t-stat	Probability
Constant	C	a	-3.05	-8.18	0.00
Domestict GDP for country i	Log(GDPD i)	b1	0.40	4.72	0.00
Domestic GDP for country j	Log(GDPD j)	b2	0.07	2.65	0.01
Domestic GDP for foreign partner	Log (GDPF)	b3	-0.24	-2.10	0.04
Import Prices	Log (PMD i)	b4	0.83	9.48	0.00
Export Prices	Log (PMFi)	b5	-0.25	-3.07	0.00
Foreign Reserve for Country i	Log (FR i)	b6	-0.02	-2.76	0.01
Foreign Reserve for Country j	Log (FR j)	b7	0.01	0.62	0.53
Openness Index for Country i	Log (OPEN i)	b8	0.01	8.01	0.00
Openness Index for Country j	Log (OPEN j)	b9	0.00	4.63	0.00
Cross Exchange rate	Log (EXRi/EXRj)	b10	-0.02	-3.19	0.00
Fixed Effects					
-GAMGHA- - C			-0.63		
-GAMGUI- - C			-0.65		
-GAMNIG- - C			-0.67		
-GAMSIE- - C			-0.73		
-GHAGUI- - C			-0.55		
-GHANIG- - C			3.73		
-GHASIE- - C			-0.63		
-GUINIG- - C			0.41		
-GUISIE- - C			-0.41		
-NIGSIE- - C			0.12		
Weighted Statistics					
R-Squared		0.83	Mean Dependent Var		0.64
Adjusted R-Squared		0.82	S.D Dependent Var		0.71
S.E of Regression		0.35	Sum Squared Residual		111.88
F-Statistics		231.42	Durbin Watson Stat		1.99
Prob (F-Statistics)		0.00			

Table 1 summarises the pooled regression results of the global bilateral intra-WAMZ import demand model. The result showed that all the explanatory variables, except foreign reserves, were significant. The model returned an adjusted R-Squared of 0.83, which indicated a very good fit. The regression output showed

that, on the average, aggregate bilateral import trade of member countries was positively impacted by their individual domestic output or GDP growth. This variable was significant for each pair of trading countries. The positive sign of Domestic GDP indicated that bilateral import demand was boosted as their individual economies grow. This result was theoretically consistent with *apriori* expectations. Growth implied the expansion of production and the demand for necessary input to grow output.

The growth of the national output of their foreign trading partner, represented here by the United States of America returned a negative sign. This implied that output growth in the foreign trading partner had the effect of depressing bilateral trade in the Zone. This result is quite plausible. If we consider that growth in output in the foreign trading partner could lead to cheaper import for WAMZ members, then it would not be difficult to understand the negative sign of that variable. This would therefore mean increased trade with the foreign partner and a diversion of trade from member countries. So, as members increase their trade with their foreign trading partner and the rest of the world, they would naturally trade less with one another. Thus, economic growth in the foreign partner has the effect of reducing intra-regional trade – a kind of trade diversion away from the WAMZ to the outside world.

This situation could also arise from the increased demand for raw materials from the WAMZ occasioned by rising output in the foreign trading partner's economy. This may in turn lead to higher revenues in the WAMZ that may be spent importing from their foreign partners. This situation is likely behind the negative sign for the coefficient of Foreign GDP as we find in this study. It is easy to see how economic prosperity, evidenced by increased output (GDP) in the foreign trading partner, diverts trade away from the sub-region. It implied an increase in demand for raw materials; more money to producers of such raw materials (the WAMZ members) and of course more imports by such members from the foreign partner where the foreign exchange earnings, from the increased supply of raw materials are normally held in reserves.

 A key objective of economic groupings like the WAMZ is trade creation - to increase trading among members of the sub-region so as to ignite growth and developmental benefits that follow trade. It is therefore very important that strategies are put in place to harness the benefits of increased supply of input to the foreign partners as their economies grow without diverting trade from members of the zone. Other factors that could enhance this trade diversion effect are the need for reciprocity. If the foreign partner patronises a member by

importing raw materials from her, such a member may be obliged to reciprocate the gesture by importing finished goods from the trading partner. Reciprocity is an acknowledged principle of international relations and is often brought to bear on trade.

Of particular relevance in this result was Trade Liberalisation or economic openness. This variable not only returned a positively signed coefficient, it was also very significant. This implied that members actually traded more with one another as trade is liberalised among them. This is a positive sign, given that only about 10.0 per cent of the trade of the Zone is taking place among members (Bamidele, 2003). This low trade, which has been blamed on both tariff and non-tariff barriers, is therefore likely to improve as the members of the Zone focus on the elimination of trade barriers among them.

The cross exchange rate variable returned a negative sign. This is a significant outcome and needs elaboration. The negative sign implied that a worsening of the exchange rate, reflecting devaluation of the local currencies of the Zone would negatively impact on bilateral trade among members. This result is not only theoretically consistent; it is understandable and also serves as a wakeup call on those handling the implementation of the common currency project of the WAMZ. The WAMZ countries are trading with one another through third currencies, mostly the United States dollar, with consequent increase in transaction costs that arise from exchange rate movements.

Foreign reserves expectedly returned an inverse relationship with import demand, while relative exchange rate also had the expected negative sign and was significant. This is also plausible. With regard to exchange rate, WAMZ members traded via a third currency, the US dollar. Exchange rate movement against their individual currencies is bound to retard trade among them. Thus, while devaluation may boost inter-WAMZ exports, it depresses intra-WAMZ imports. As regards trade liberalisation, the zone-wide bilateral intra-WAMZ trade model returned positively signed and significant coefficients. Thus, trade liberalisation, had a bolstering effect on bilateral intra-WAMZ trade.

V.   Summary, Conclusions and Recommendations

The results of the study reflect the present character of trade among member countries of the Zone. There is a high degree of trade diversion from members to the outside world. The importance of trade liberalisation in the growth of regional trade was highlighted by the results, which showed its potential to expand intra-regional trade. The continued presence of trade barriers is contrary to the terms of

the various protocols established by the sub-region. Bilateral trade among members of the Zone would profit from a concerted effort on the part of members to further liberalise trade and focus more on factors that create rather than divert trade among members.

The negative effects of trading with a third currency rather than a zonal single currency of their own reflected in the results. Member's pursuit of their individual monetary and exchange rate policies has negative effect on their bilateral trade. The need for the Eco to become operational therefore continues to be urgent. The influence of former colonial masters who often times are the major trading partners of members of the WAMZ continue to impact trade in the sub-region. There appears therefore to be a substantial trade diversion to these partners and away from the integrating members. It would be profitable for members to make concerted effort to divert trade to themselves within the limits of their internal economic interests.

Based on these findings on the impact of exchange rate on intra-regional trade, the study recommends, that concerted effort should be made to implement the single currency policy without further delay. There is need to re-examine the macroeconomic convergence approach. The time has come to seek ways to achieve the single currency objective without hinging it on the ever elusive macroeconomic convergence. This will not only eliminate unnecessary transaction costs incurred by members in trading with one another, but also facilitate economic interaction among them.

This research shed more light on the understanding of the role of exchange rate in the import demand in the Zone by providing evidence that devaluation of the local currencies of the sub-region will not reduce their demand for imports from the rest of the world. It has therefore widened our perspectives and added to the body of knowledge in this field.

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