Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.13, No.8, 2022

Impact of Foreign Aid on Economic Growth in the West African Monetary Zone using Non-linear Autoregressive Distributed Lag

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Abstract
This study analyses the pattern of asymmetric relationship between foreign aid and economic growth in five aid receiving countries in WAMZ using the Non-linear Autoregressive Distributed Lagged (NARDL) for the period, 1985 to 2018. Results from the NARDL estimation shows the presence of asymmetric long-run relationships. Increase in the flow of multilateral aid positively impact real per capita Gross Domestic Product (GDP) of the WAMZ at the coefficient estimate of 2.13 while decrease in multilateral shows positive but lower coefficient estimate of 1.74. Similarly, increase in the flow of bilateral aid positively impacts real per capita GDP but at a statistically insignificant coefficient value of 0.06, and interestingly, decrease in the flow of bilateral aid positively impacts real per capita GDP of the WAMZ at the coefficient estimate of 0.24. The results provide evidence that, in the long-run, increase in the flow of multilateral aid enhances the economic growth of the WAMZ while increase in bilateral aid was ineffective on growth. The granger causality estimation shows evidence of unidirectional causality running from multilateral aid to real per capita GDP, from bilateral aid to real GPD per capita and from bilateral aid to multilateral aid. The policy implication of these findings suggests that multilateral and bilateral aid inflows are useful for economic growth in the WAMZ. Overall, we conclude that multilateral aid is a much more fruitful channel through which countries within the WAMZ can stimulate economic growth in the long run. Therefore, bilateral donors should channel their assistance through multilateral organisations such as the IMF and the World Bank as multilateral aid is a more effective conduit through which foreign aid can boost the economic growth of the WAMZ.
Keywords: Bilateral aid, Economic growth, multilateral aid, Population growth rate, West Africa monetary zone
DOI: 10.7176/JESD/13-8-04
Publication date: April 30th 2022

1. Introduction

Foreign aid is an important policy tool for rich countries to improve the well-being of poor countries thereby contributing to poverty alleviation, institutional development and economic growth. It is pertinent to state that foreign aid programmes have long existed before evidence emerged that aid could be beneficial for economic growth. Foreign aid is the assistance from donor countries and multilateral organisations designed to promote the economic development and welfare of developing countries (OECD, 2020). It comes in the form of bilateral grants, multilateral flows, loans, project aid, food aid and emergency relief as well as technical assistance. Basically, foreign aid consists of multilateral aid, which is channeled through an intermediary institution and development partners like the International Monetary Fund and World Health Organization; and bilateral aid that flows directly from donors to aid recipients. Expectedly, bilateral and multilateral donors allocate foreign aid differently given variations in motives and determinants of aid. In fact, different motivations and objectives would have presumably divergent consequences when it comes to aid allocations.

The two-gap model, developed by Chenery and Strout (1966) explained that foreign aid is an important ingredient for boosting economic activity in aid recipient countries and also plays a very important role in supplementing domestic resources to relieve savings or foreign exchange bottlenecks faced by developing countries. The basic argument here is that most developing countries either lack domestic savings to match their investment opportunities or lack foreign exchange to finance needed imports of capital and intermediate goods (Todaro and Smith, 2009). With a need to increase investment and imports, the savings gap and foreign exchange gap are mostly filled with foreign aid. Thus, for developing countries, foreign aid is critical as it could lead to increased investment and consumer spending, as well as reduction in foreign debt, all of which would facilitate economic growth.

There has been a large number of studies exploring the relationship between foreign aid and economic growth. However, the impact of foreign aid on the economic growth of the WAMZ remains questionable. Given the large flow of foreign aid, coupled with the slow rate of economic growth, it has become imperative to undertake this empirical study to assess the impact of foreign aid on economic growth in the WAMZ. Therefore, the primary goal of this study is to understand how foreign aid affects economic growth in the WAMZ using five aid receiving countries (Gambia, Ghana, Guinea, Nigeria and Sierra Leone). The specific objectives are to determine the impact of bilateral aid on economic growth in the WAMZ, examine the impact of multilateral aid

on economic growth in the WAMZ, investigate the direction of causality among bilateral aid, multilateral aid, population growth rate and economic growth in the WAMZ and determine whether the impact of multilateral and bilateral aids on economic growth is non-linear. Unlike previous studies that aggregated different types of foreign aid, including bilateral aid, multilateral aid and others into a single total making it impossible to draw conclusions about the individual contribution of any specific type of aid to aggregate economic growth. This study contributes to existing literature by disaggregating foreign aid into bilateral and multilateral aid.

Foreign aid from developed countries to developing countries has continued to flow and over time, Africa regions including the West Africa Monetary Zone (WAMZ) have been recipients of bilateral and multilateral aid. The flow of foreign aid in the WAMZ stood at US$457.10 million in 1985 and increased significantly to US$5.70 billion in 2018 (OECD, 2020), accounting for an average annual growth rate of 8.02 per cent year-on-year. On a disaggregated basis, the WAMZ received US$45.67 billion of aid from multilaterally and US$61.11 billion bilaterally between 1985 and 2018; totaling US$106.78 billion (OECD, 2020). The trend of flow of multilateral and bilateral aid in the five WAMZ countries (Gambia, Ghana, Guinea, Nigeria and Sierra Leone) is presented in figure 1.

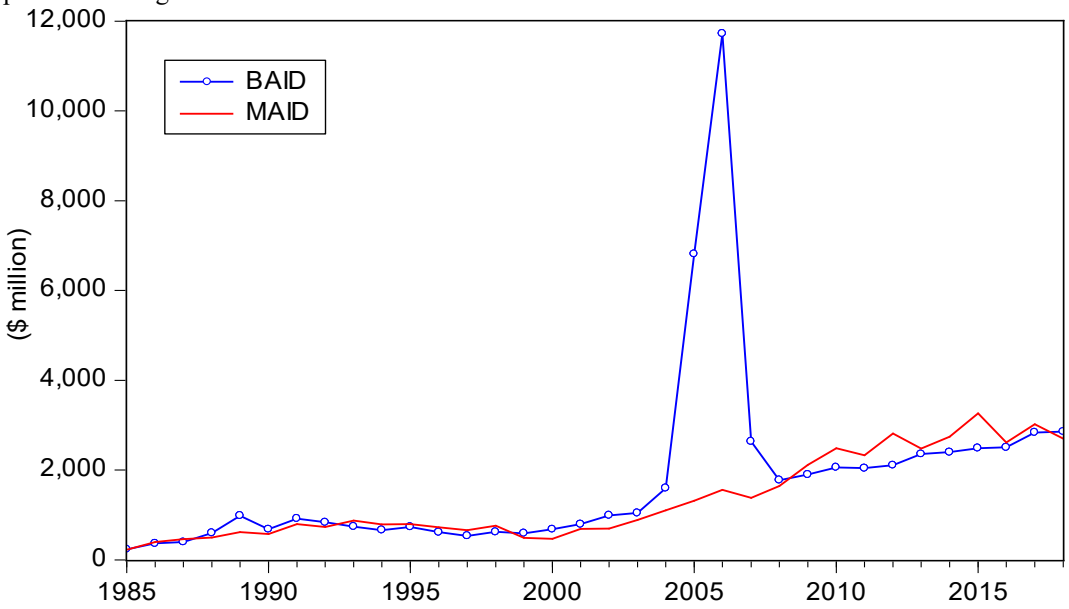

Figure 1: The Trend of Flow of Multilateral and Bilateral Aid in the WAMZ from 1985-2018
Source: Author's presentation using data from Organisation for Economic Co-operation and Development (2020).

Multilateral aid allocation in the WAMZ accounts for 36.23% of total aid from 1985 to 2018 compared to bilateral aid which accounts for 63.77%. Bilateral aid is therefore, a significant channel through which wealth is transferred from developed donor countries to the WAMZ. On the other hand, real per capita GDP in WAMZ increased from US$395.92 in 1985 to US$1,350.37 in 2018 (WDI, 2020); accounting for an average growth rate of 1.68 per cent per annum, far lower than the target benchmark of 7 per cent growth rate per annum for the WAMZ. The trend of Real GDP per capita in the five WAMZ countries is presented in figure 2.

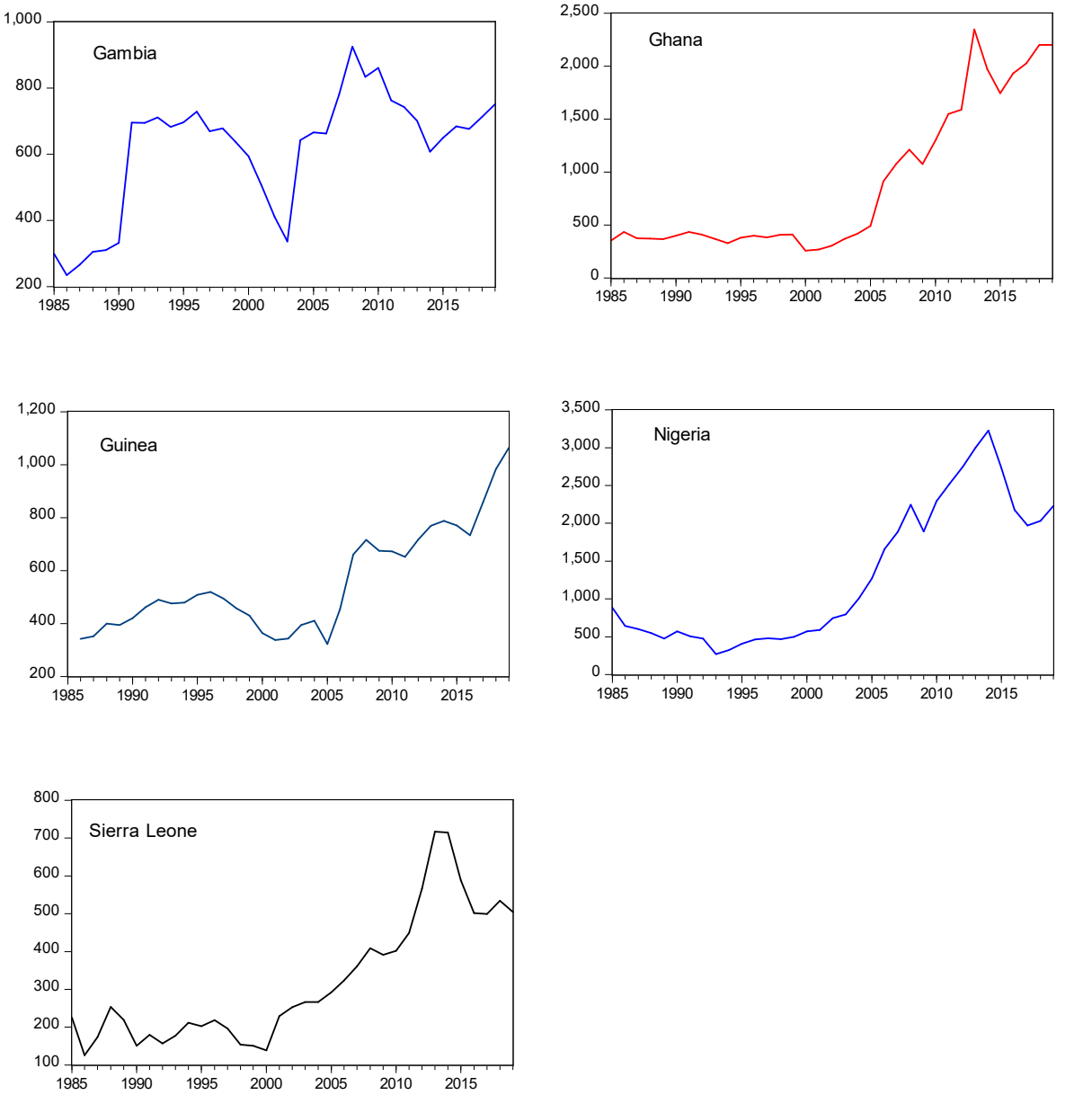

Figure 2: Trend of Real GDP Per Capita in the five WAMZ Countries from 1985-2018
Source: Author's presentation using data from World Bank development Index (2020)

Given the large flow of foreign aid coupled with the slow rate of economic growth, it has become imperative to undertake this empirical study to assess the impact of foreign aid on the economic growth in the WAMZ. The rest of the paper is organised as follows: Section two reviews the literature with focus on the theoretical framework and empirical studies. Section three describes the methodology of the study. Section four presents the results and discussion while section five concludes the paper.

2. Literature Review

2.1 Theoretical Framework

The theoretical framework of the study is based on the Cobb and Douglas (1934) production function, which is mainly used for calculating ratios of factor inputs required for efficient production and is widely used in economic literature and econometric applications to model the relationship that exist between input and output. The function allows for the exploration of the production process using a variety of input variables and can be estimated as restricted input coefficients that sum to one or without this restriction to reflect the type of scale for the economy. The other main characteristic of the production function is the fact that the substitution elasticity is unitary. In economic literature, the known formula of the production function, keeping other inputs constant is the following:

$$Y = AK^{\alpha}L^{\beta} \qquad (1)$$

Q, L, and K are output, labour, and capital, respectively, while A, α, and β are constants (Fraser, 2002). The assumption was constant returns to scale (CRS) with $\alpha + \beta = 1$. As a result of Constant Return to Scale (CRS), Fraser, (2002) stated that it was only needed to estimate α, avoiding any potential problem of collinearity in estimation. The imposition of the CRS restriction without testing is econometrically unsatisfactory, and the restriction was subsequently relaxed by Cobb and Douglas, without effecting the estimated values for α and β.

In the original specification of the functional relationship, technical changes were omitted. The need to take account of technical change in estimation of the production function was noted by Handsaker and Douglas (1937) and Williams (1945). Williams (1945) emphasized on the need to re-estimate the data with an additional explanatory variable to proxy technical changes, unless it is feasible to assume that over the entire data period there existed constant technology (i.e., A is constant). The time trend (T) is a standard way of introducing the possibility of technical change. Despite being assumed exogenous to the estimated specification, this capture observed changes in technology. With the introduction of T, the data is de-trended, without which it would be likely that the regression estimates would only capture historic growth rates for the data (Fraser, 2002).

$$Y = A(t)K^{\alpha}L^{\beta} \qquad (2)$$

where $A(t) = Ae^{\delta}$. A and δ are constants, δ is a measure of the proportionate change in output per time period when input levels are held constant (i.e. the proportionate change in Q that happens as a result of technical progress) (Fraser, 2002). Despite the fact that this specification takes into account a neutral technical change, the marginal rate of substitution between capital and labour is not affected. The condition is, therefore, that technical change occurs exogenously, without taking place in the economic process. Equation (3) typically looks like this:

$$\ln Y = a + \delta T + \alpha \ln L + \beta \ln K + e \qquad (3)$$

The subscript 'e' represents an error. The log-linear specification means that the estimates of α and β are elasticities and to assess CRS simply requires a hypothesis test on the sum of α and β. Cobb and According to Douglas (1934), the production function is neither grounded in solid theoretical principles nor should it be regarded as a law of production; rather, it represents an approximation of observed relationships between production inputs and output. The theoretical basis of this research rests upon the application of the Cobb and Douglas (1934) production function.

2.2 Empirical Review

In recent years, numerous studies have been conducted on effectiveness of foreign aid in under-developed and developing countries, and three distinct camps have emerged. First, there are supporters of foreign aid who argue that it can lead to economic growth in developing countries (Cavoli, 2020; Harb and Hall, 2019; Sothan, 2018; Arndt, Jones, and Tarp, 2015). Second, are the aid critics such as Babalola and Shittu (2020), Dreher and Langlotz (2020), who uphold that aid has negative impact on growth or its ineffective. The third group argue that the effectiveness of aid is determined by the method donors use to allocate aid, as well as the characteristics of the recipient country, including governance, commitment, ownership, and institutional capacity.

Studies examining the aid-growth nexus conducted by Burnside and Dollar (2000), examined 56 developing countries from 1970-1993 and concluded that foreign aid has a positive effect on growth, but that the effect depends on the policy environment. Burnside and Dollar's (2000) study was based on several regressions in which the dependent variable of growth rates depends on initial per capita national income, an index that measures institutional and policy distortions, foreign aid and then aid interacted with policies. In certain specifications, Burnside and Dollar (2000) included variables for ethnic fractionalization, whether assassinations occurred, dummy variables for certain regions and even a measure of arms imports. They found significant positive interactions between foreign aid and good policy in many of their specifications.

Focusing on regional economies, Adamu (2013) investigated the impact of foreign aid on economic growth in member countries of the Economic Community of West African States (ECOWAS) using panel data for 1990-2009 and a three-equation simultaneous-equations model. Foreign aid had a positive and strong effect on economic growth among these ECOWAS countries and interest rates, foreign direct investment, and international reserves are also important drivers of economic growth. They concluded that foreign aid is positively correlated with domestic investment, exports, and international reserves while domestic savings and exchange rate were positively related to investment.

Similarly, Bruckner (2013) obtained data for forty-seven least developed countries from 1960 to 2000 and employed the Ordinary Least Square technique, Two-stage Least Square, Generalized Method of Moments including instrumental variables. The author found that foreign aid has a significant positive effect on the growth of real per capita GDP by showing that a 1 per cent increase in GDP per capita growth decreased foreign aid by over 4 per cent. However, when he adjusted for this quantitatively large and negative reverse causal effect of economic growth on foreign aid, Bruckner (2013) found that an increase of 1 percentage point of foreign aid was able to increase real per capita GDP growth by around 0.1 percentage points. In addition, he provided evidence supporting the proposition that foreign aid has a significant positive average effect on per capita GDP growth if, and only if, the negatively large reverse causal effect of per capita GDP growth on foreign aid is taken into

account in the growth regression.

Employing an endogenous growth model, Liu, Zhang and Chao (2014), examined the growth and welfare effects of foreign aid in the aid-dependent countries and argued that since a portion of foreign aid is used for productive purposes, a rise in its allocation can increase the economy's growth rate. The fact that aid is also transferred to the public in one lump sum may not always improve the welfare of the economy. This results in an increase in individual wealth, thus providing less incentive for individuals to learn and work, but with more leisure time to do so. In light of this effect, they also examined how foreign aid should be allocated to achieve the highest levels of growth and welfare. The findings of their study are that along the balanced growth path, the allocation of aid that maximizes welfare will differ from the allocation that maximizes growth. Based on a growth perspective, more aid is required to fund the production of goods and the accumulation of human capital. To maximize welfare, more funds should be allocated to transfer payments instead of human capital accumulation.

Focusing on the long-run cumulative effects of foreign aid for a cross section of developing countries from 1970-2007 and taking due account of potential endogeneity, Arndt, Jones and Tarp (2015) in their study utilised the Simultaneous equation model. They found that foreign aid has over the past 40 years stimulated growth, promoted structural change, improved social indicators and reduced poverty. The study also found that foreign aid also reduces poverty on average and over the long-run with no significant negative effects on inequality and contributes to rapid expansion of modern industrial sectors and a decline in the share of agriculture in GDP.

Dabla-Norris, Minoiu and Zanna (2015) studied twenty-two aid donor countries and one hundred and thirteen aid recipient countries from 1970-2005. They employed Baseline econometric model and found that that bilateral aid flows are on average procyclical with respect to the business cycle in both donor and recipient countries. They concluded that developmental aid plays an important cushioning role during the times of severe macroeconomic stress and while aid outlays contract sharply during severe downturns in donor countries, they rise steeply when aid-receiving countries experience large adverse shocks.

In a similar study but focusing on aid effectiveness on transitional economies, Askarov and Doucouliagos (2015) found that aid has a positive impact on growth in transitional economies and foreign aid effectiveness is not conditional on good policy and there is little evidence of non-linear growth effects arising from foreign aid. The analysis covers a 23-year period, 1990 to 2012, for all 32 transition economies.

Jones and Tarp (2016), using simultaneous equation model and data covering 1983-2010, claim that aid has positive effect on economic growth and that aid influences a range of proximate sources of growth and development outcomes, such as physical and human capital, poverty, infant mortality including some economic transformation measures, such as agriculture and industry value added. The opined that there is no evidence that aid is detrimental as it has contributed to economic growth by stimulating its proximate determinants such as physical capital accumulation and improving human capital, particularly education and health.

Taking a panel of 54 African countries and employing pooled, Generalized Least Squares and panel regression, Alghamdi (2016) investigated the impact of foreign aid, policies, and their interaction on economic growth for a period of 35 years from 1980 to 2015 and found that foreign aid has diminishing returns and countries that depend too much on foreign aid may experience detrimental consequences. The results also confirm that African countries that have received foreign aid for a long-time were adversely affected and better policies do not always result in aid effectiveness, as excessive reliance on foreign aid creates moral hazards, and recipient countries suffer more when corrupted governments use aid to satisfy their own selfish needs.

In a country specific study, Sothan (2018) used the Autoregressive Distributive Lag (ARDL) bounds testing approach and annual data from 1980–2014 and found that foreign aid has positive impact on economic growth in Cambodia only for the short-run and negative impact on economic growth in the long-run. This can be suggested that Cambodia may not benefit from long-term reliance on foreign aid for investments and growth.

Harb and Hall (2019) investigates the non-linear relationship between foreign aid and economic growth for 25 developing countries during the period from 1984 to 2008. Identifying the estimated coefficients at each point in time, as well as endogenously determining the threshold level for estimation of the Panel Smooth Transition Regression Model (PSTR) was a new insight presented by the authors. It was concluded that foreign aid impact positively on economic growth in upper middle countries but with diminishing returns while lower middle and least developed countries support the big push theory which implies increased aid stimulates economic growth.

Sethi, Bhujabal, Das, and Sucharita (2019) utilized a number of econometric techniques including VAR modelling to determine the short and long-run equilibrium dynamics between aid and growth using annual time series data from 1960–1961 for India and 2014–2015 for Sri Lanka. The impulse response from their study presents a positive relationship between foreign aid and better trade performance, development of financial sector, and domestic capital formation in India However, in Sri Lanka, they found that foreign aid does not have a significant impact on growth, both in the long-run and short-run.

Using data from 74 developing countries for the period 1980–2016 and employing the Two-stage Least Square model, Maruta, Banerjee and Cavoli (2020) considered three different types of bilateral aid, namely

education, health and agriculture, and found that among the three types of aid, education aid is more effective for aid-receiving countries. However, the effect varies considerably across regions depending on the current level of institutional quality. They claim that aid has positive effect on economic growth for the past 40 years and influence a range of proximate sources of growth and development outcomes, such as physical and human capital, poverty and infant mortality and economic transformation measures and while education aid is more effective in South America, health aid is more effective in Asia and agricultural aid is more effective in Africa and as the level of institutional quality improves, the gap between the marginal effect of education, health and agricultural aids widen.

In a region-specific study, Babalola and Shittu (2020) examined the effect of foreign aid and economic growth in West Africa using panel data from 1996 to 2017 and the ARDL and their results revealed that foreign aid does not stimulate the growth in West African region, both in the short-run and the long-run. In fact, they observed a negative link between aid and economic growth when the index of institutional indicators was incorporated into the analysis. This interaction effect posits that improvements in institutional infrastructures reduce the negative effect of foreign aid on economic growth.

Dreher and Langlotz (2020) used an excludable instrument to test the effect of bilateral foreign aid on economic growth in a sample of 97 recipient countries over 1974–2013 period and their results show a positive but insignificant effect of aid on growth. They interacted donor government fractionalization with recipient country's probability of receiving aid. The result showed that fractionalization increases donor's aid budget. They concluded that foreign aid does not affects growth.

Ouedraogo, Sourouema and Sawadogo (2020) explored a sample of twenty-five countries using a finite mixture model and various metrics of institutional variables to determine the importance of incorporating heterogeneity in growth processes. They found that the impact of foreign aid on growth differs across three different groups of countries and that aid works best in countries with effective government, good regulatory quality and low corruption.

3.0 Methodology

3.1 Model Specification

The theoretical basis for the research follows the Cobb-Douglas production function discussed in Section 2. The production function formulated as follows:

$$Y_{it} = A_{it}K_{it}^{\alpha}L_{it}^{\beta} \qquad (4)$$

Where Y_{it} denotes aggregate output of country i, at time t, A represents technological progress or total factor productivity (TFP), L is human capital (labour), K is the physical capital stock, and β and α are the elasticities of aggregate output with respect to capital and labour. The output elasticity of output, ceteris paribus, measures the response of output to a change in labour or capital inputs. Based on constant technology, increasing the level of inputs in the model will increase the level of output. Technological progress, denoted as A, is what is responsible for the growth in output that is not accompanied by an increase in input. For computational simplicity, we adopted econometric models analogous to the equation (4) to analyse the nexus between foreign aid and economic growth in equation (5).

$$\mathrm{rPGDP} = \mathrm{f}(\mathrm{MAID}, \mathrm{BAID}, \mathrm{PGR}) \qquad (5)$$

The production function above represents the quantity produced from any combination of factors of production [labor (PGR) and capital (MAID and BAID)] getting the optimal production result. It is imperative to state that, population growth stimulates productivity in a couple of ways; through the supply additional labor force and creation of extra demand in the economy (Oxley and Greasley, 1998). Therefore, we argue that, economic growth in the WAMZ is the function of multilateral aid (MAID), bilateral aid (BAID) and population growth rate (PGR). Thus, the model is expressed as follows:

$$\mathrm{rPGDP} = \alpha_1\mathrm{MAID} + \alpha_2\mathrm{BAID} + \beta\mathrm{PGR} \qquad (6)$$

Where, rPGD represent real GDP as a proxy for economic growth. To account for heterogeneity in aid allocation programmes, physical stock of capital (K) was segregate into multilateral aid (MAID) and bilateral aid (BAID). The elasticity of output with respect to capital represented by α was divided into two; α_1 *and* α_2 to account for the coefficient of MAID and BAID.

By including error term ε in (7) we convert the above deterministic relationship into statistical one and can write our model as follows:

$$\mathrm{rPGDP} = \alpha_1\mathrm{MAID} + \alpha_2\mathrm{BAID} + \beta\mathrm{PGR} + \epsilon_{it} \qquad (7)$$

Due to the presence of mixed levels stationarity among series, the Non-linear Panel Autoregressive Distribution Lag (NARDL) approach, advanced by Shin, Yu, and Greenwood-Nimmo (2014), as an asymmetric extension to the well-known ARDL model of Pesaran and Shin (1999) and Pesaran et al. (2001), was implemented in this research. This is to capture both long and short-run asymmetries in the variables. To begin, we specify the following asymmetric long-run equation of real per capita GDP (Shin, Yu and Greenwood-Nimmo, 2014):

$$rPGDP_{it} = \beta_0 + \beta_1 MAID_{it}^{+} + \beta_2 MAID_{it}^{-} + \beta_3 BAID_{it}^{+} + \beta_4 BAID_{it}^{-} + \beta_5 PGR_{it} + \epsilon_{it} \quad (8)$$

Where, i =1 …, N represents the countries within the WAMZ in the panel, t =1 …, T refers to the time period. The parameters $\beta = (\beta_o, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5)$ are vector of long-run parameters to be estimated. The white noise error term is represented by ϵ_t. MAID and BAID series were decomposed into two parts which represent the partial sums of positive and negative parts of MAID and BAID variables. Thus, $BAID_{it}^{+}$, $BAID_{it}^{-}$, $MAID_{it}^{+}$, and $MAID_{it}^{-}$ are partial sums of positive and negative changes in $BAID_{it}$ and $MAID_{it}$.

Based on the above formulation, the long-run relationship between economic growth and positive changes in multilateral aid is represented by β_1 while β_2 captures the long-run relationship between economic growth and negative changes in multilateral aid. On the other hand, β_3 captures the long-run relation between economic growth and positive changes in bilateral aid while β_4 is the coefficient of the long-run relationship between economic growth and negative changes in bilateral aid. The coefficient of the relationship between population growth and economic growth is represented by β_5. The long-run relationship as represented in equation 8 reflects asymmetric long-run impact of increases and decreases in the flow of bilateral and multilateral aid on economic growth. $MAID_{it}^{+}$, and $MAID_{it}^{-}$ were computed as follows

$$MAID_{it}^{+} = \sum_{i=1}^{t} \Delta MAID_{it}^{+} = \sum_{i=1}^{t} \max(\Delta MAID_{it,}^{+}\ 0) \quad (9)$$

$$MAID_{it}^{-} = \sum_{i=1}^{t} \Delta MAID_{it}^{-} = \sum_{i=1}^{t} \min(\Delta MAID_{it,}^{-}\ 0) \quad (10)$$

While $BAID_{it}^{+}$, and $BAID_{it}^{-}$ are calculated as follows:

$$BAID_{it}^{+} = \sum_{i=1}^{t} \Delta BAID_{it}^{+} = \sum_{i=1}^{t} \max(\Delta BAID_{it,}^{+}\ 0) \quad (11)$$

$$BAID_{it}^{-} = \sum_{i=1}^{t} \Delta BAID_{it}^{-} = \sum_{i=1}^{t} \min(\Delta BAID_{it,}^{-}\ 0) \quad (12)$$

Equation (8) shows a model of static asymmetric regression and indicates the non-linear relationship between bilateral aid, multilateral aid and economic growth in the long-run. In addition to nonlinearity, there are also dynamic relationships among variables and the underlying dynamic non-linear connection between the variables can be estimated using an unrestricted NARDL model. The following equation (8) can be incorporated into a standard non-linear ARDL model to produce an unrestricted NARDL model:

$$\begin{aligned} rPGDP_{it} = \gamma + \beta_0 rPGDP_{it-1} + \beta_1 MAID_{it-1}^{+} + \beta_2 MAID_{it-1}^{-} + \beta_3 BAID_{it-1}^{+} + \beta_4 BAID_{it-1}^{-} + \beta_5 PGR_{it-1} \\ + \sum_{i=1}^{p} \Delta rPGDP_{it-1} + \sum_{i=0}^{q} (\lambda^{+} \Delta MAID_{it-1}^{+} + \lambda^{-} \Delta MAID_{it-1}^{-}) + \sum_{i=0}^{q} (\varphi^{+} \Delta BAID_{it-1}^{+} \\ + \varphi^{-} \Delta BAID_{it-1}^{-}) + \theta \Delta PGR_{it-1} + \epsilon_{it} \end{aligned} \quad (13)$$

Equation (13) determines the non-linear short-run relationship between bilateral aid, multilateral aid and economic growth. Namely, $\sum_{i=1}^{q} \lambda^{+}$ and $\sum_{i=1}^{q} \varphi^{+}$ measures the short-term impacts of the increase in the multilateral and bilateral aid on the economic growth while $\sum_{i=1}^{q} \lambda^{-}$ and $\sum_{i=1}^{q} \varphi^{-}$ captures the short-term impacts of decrease in of multilateral and bilateral aid on the economic growth. Thus, the estimation of the unrestricted NARDL model based on Equation (13) exhibits the dynamic characters of underlying relationship between multilateral aid, bilateral aid and economic growth. Estimation of unrestricted NARDL model also lets us test both long and short-run symmetries among the variables.

3.2 Estimation Procedure

3.2.1 Panel Unit Root Test

In estimating the model, the stationarity of the variables is determined using a panel unit root test. Levin, Lin and Chu (2002), and Im, Pesaran and Shin (2003), Maddala, and Wu (1999), Choi (2001) and Hadri (2000) have developed multiple unit root-tests for panel data structures and the tests are divided into two. Levin, Lin and Chu (2002), and Im, Pesaran and Shin (2003) use Augmented Dickey Fuller tests, while Maddala, and Wu (1999), Choi (2001) and Hadri (2000) use Phillip-Perron tests. In an AR(1) process for panel data, the tests are formally described as follows:

$$\Delta y_{it} = \alpha y_{it-1} + \sum \beta_{ij} \Delta y_{it-j} + X_{it}\delta + v_{it} \quad (14)$$

Where:

y_{it} = pooled variable

X_{it} = exogenous variables in the model (country fixed effects and individual time trends) and

v_{it} = error terms which are assumed to be mutually independent disturbances.

As indicated above, it is assumed that $\alpha = \rho - 1$ is identical across the three cross-sections, but the lag order for the difference terms across the three sectors is allowed to vary. By contrast, the less restrictive Im, Pesaran and Shin test (and other widely used tests such as the Augmented Dickey Fuller Fisher Chi-square) estimates a separate Augmented Dickey Fuller regression for each of the three cross sections to allow for individual unit root processes; i.e., ρi may vary across cross-sections (referred to in the literature as pooling the residuals along the between-dimension). In the model, if $\rho < 1$ is considered to be weakly (trend) stationary and if $\rho = 1$, it is considered that it has a unit root. The Levin-Lin-Chu's (2002) test assume that there is a common unit root process for all the cross sections with a null hypothesis similar to the Augmented Dickey Fuller test. Therefore, it is assumed that $\alpha = \rho - 1$ is equal across the three cross-sections. Only the Im, Pesaran and Shin's (2003) test estimates a separate Augmented Dickey Fuller regression for each of the three cross sections and therefore ρi could be different in each cross-section.

3.2.2 Panel Cointegration Analysis

In order to determine the existence of a long-term equilibrium among the variables included in the model, residual based panel cointegration tests were estimated according to the methodology developed Pedroni (1999; 2004). The Pedroni panel cointegration tests is an extension of the Engle and Granger's (1987) framework that uses four panel statistics and three group panel statistics to test the null hypothesis of no cointegration against the alternative hypothesis of cointegration. Pedroni (2004) combines the residual-based Lagrange multiplier (LM) tests, augment Dickey Fuller and the Philips-Perron principles. The model specification is as follows:

$$y_{it} = \alpha_i + \delta_{it} + \beta_{1i}X_{1i,t} + \beta_{2i}X_{2i,t} + \ldots\ldots\ldots + \beta_{mi}X_{mi,t} + \epsilon_{i,t} \qquad (15)$$

Where y and x are assumed to be cointegrated to order one I(1), the parameters α and δ are the individual and trend effects. The null hypothesis assumes no cointegration of the residuals I(1) and is tested by running a regression of the residuals εi,t, and constructing a cointegration statistic that varies depending on the values of N and T.

3.2.3 Granger Causality Estimation

Granger (1988) states that if the estimated variables are cointegrated then there is a causal relationship among them in at least one direction. The Granger causality test was estimated and causality inferred using the standard Wald test. A null hypothesis holds that the coefficient(s) of the lag regressors or explanatory variables do not equal zero. An alternative hypothesis holds that they do not equal zero. When the probability value of the χ2 statistic is less than 5% ($p > 0.05$), the null hypothesis is rejected. The general model for granger causality (Engle and Granger, 1987) variable is given as:

$$\Delta Y_{t=}\,\eta + \sum_{i=1}^{p-1}\alpha_i\Delta Y_{t-1} + \sum_{j=1}^{p-1}\beta_j\Delta Y_{t-1} + \phi(Y - kX)_{t-1} + U_t \qquad (16)$$

$$\Delta X_{t=}\,\eta' + \sum_{i=1}^{p-1}\gamma_i\Delta Y_{t-1} + \sum_{j=1}^{p-1}\delta_j\Delta Y_{t-1} + \theta(Y - kX)_{t-1} + U_t' \qquad (17)$$

The lagged Error Correction Term (ECM) $(Y - kX)_{t-1}$ according to Engle and Granger, (1987) are the lagged residuals from the cointegrating relation between Y and X (this term is not included in case the variables are not co-integrated). As Engle and Granger (1987) have argued, failure to include the ECM term will lead to miss-specified models which can lead to erroneous conclusions about the direction of causality. Thus, if Y_t and X_t are I(1) and cointegrated, granger causality tests can be carried out using equations (16) and (17). However, there are now two sources of causation of Y_t by X_t, either through the lagged dynamic terms ΔX_t if all the β_j are not equal to zero, or through the lagged ECM term if ϕ is non-zero (Engle, Hendry & Richard, 1983). Similarly, X_t is granger caused by Y_t either through the lagged dynamic terms ΔX_t if all the γi are not equal to zero, or through the lagged ECM term if θ is non-zero (Nkoro and Uko, 2016). Therefore, this method has the additional advantage of allowing identification of the source of causation in terms of either short-run dynamics or disequilibrium adjustments.

3.3 Description and Sources of Data

The study utilised panel data of five aid receiving countries in the WAMZ (Gambia, Ghana, Guinea, Nigeria and Sierra Leone) obtained from secondary source for the period 1985 to 2018. Real per capita GDP (rPGDP) and population growth rate (PGR) data were obtained from the world development indicators while data on bilateral and multilateral aid were obtained from the OECD. The Gambia and Sierra-Leone have zero reported values on bilateral aid for some years. Therefore, the panel data used in this research is unbalanced. The description of variables and their measurement are as follows:

Real per capita GDP (rPGDP): Economic growth, which serves as the independent variable in this study is measured by real per capita Gross Domestic Product (GDP). Real per capita GDP is gross domestic product converted to international dollars using purchasing power parity rates.

Bilateral Aid (BAID): Net bilateral aid is the net disbursements of official aid from donor countries to the WAMZ. Net disbursements are gross disbursements of grants and loans minus repayments of principal on earlier loans. The data consists of loans made on concessional terms (with a grant element of at least 25 percent, calculated at a rate of discount of 10 percent) and grants made to promote economic development and welfare of the WAMZ countries.

Multilateral Aid (MAID): Net multilateral aid consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by multilateral institutions to promote economic development and welfare in countries and territories. It includes loans with a grant element of at least 25 percent (calculated at a rate of discount of 10 percent).

Population Growth Rates (PGR): Annual population growth rate for year t is the exponential rate of growth of mid-year population from year t-1 to t, expressed as a percentage.

4.0 Results and Discussion

4.1 Descriptive Statistics

The statistical properties of the variables were checked before applying any econometric technique to establish both the short-run and long-run causal relationship. The descriptive statistics of BAID, MAID, rPGDP and PGR for the period 1985 to 2018 are presented in table 1.

Table 1: Descriptive Statistics of the Variables

	BAID	PGR	RPGDP	MAID
Mean	359.4951	2.628322	716.0510	268.6419
Median	147.5200	2.611705	499.3807	150.9300
Maximum	10820.35	4.978655	3222.694	1613.840
Minimum	11.71000	-0.444094	125.1521	13.50000
Std. Dev.	971.5660	0.785609	615.3516	324.3583
Skewness	8.572965	-0.757324	2.050734	2.209911
Kurtosis	86.50527	7.924681	6.737909	7.770705
Jarque-Bera	51475.38	188.0387	216.8411	299.5857
Probability	0.000000	0.000000	0.000000	0.000000
Sum	61114.16	446.8147	121012.6	45669.13
Sum Sq. Dev.	1.60E+08	104.3037	63614473	17780199
Observations	170	170	170	170

Source: Author's computation using E-views 10

The table reports the range of data (minimum-maximum), the mean and standard deviation for each variable. Each of the variables contains 170 country-year observations from five aid receiving countries in the WAMZ. All variables are positively skewed, implying the presence of higher values than the sample mean of each of the variables. All variables are leptokurtic, with a kurtosis greater than 3 and the probability value of the Jarque-Bera normality test statistic shows a value of less than 1%. This implies that all the variables are not normally distributed. The mean and median values of bilateral aid are 359.49 and 147.5 respectively while the mean and median values for multilateral aid are 268.6 and 150.9 respectively.

4.2 Panel Unit Root Result

Table 2 below shows that at levels, Levin, Lin and Chu's (2002) stationarity tests for all the variables are below 5% level of significance. Therefore, the null hypothesis of the existence of a unit root was rejected. The results of the Im, Pesaran and Shin (2003) and Phillips and Perron-Fisher (PP-Fisher) tests show that the probability values for BAID and PGR, respectively are above 5% level of significance. Thus, we failed to reject the null hypothesis regarding the presence of a unit root at level.

At first difference, the Augmented Dickey Fuller-Fisher and Phillips and Perron-Fisher (PP-Fisher), Levin, Lin, and Chu (2002) and Im, Pesaran, and Shin (2003) show that the variables are all stationary at I(1).

Table 2: Panel Unit Root Tests Results

Vriable	Levin, Lin and Chu		Im, Pesaran & Shin		ADF – Fisher		PP – Fisher	
	t-statistic	P-value	t-statistic	P-value	t-statistic	P-value	t-statistic	P-value
Panel A: Level								
BAID**	-1.76019	0.0392	-1.28137	0.1000	22.9776	0.0108	22.3784	0.0133
PGR**	-8.52916	0.0000	-8.23008	0.0000	81.0223	0.0000	5.64053	0.8445
MAID*	-7.80969	0.0000	-8.89368	0.0000	81.7911	0.0000	144.691	0.0000
rPGDP*	-6.22981	0.0000	-6.37832	0.0000	58.0327	0.0000	81.8058	0.0000
Panel B: First Difference								
BAID*	-9.90095	0.0000	-11.0582	0.0000	101.210	0.0000	454.295	0.0000
PGR*	-10.1067	0.0000	-11.4129	0.0000	107.490	0.0000	22.6471	0.0121
MAID*	-9.84675	0.0000	-12.1611	0.0000	138.467	0.0000	264.219	0.0000
rPGDP*	-8.28183	0.0000	-7.90718	0.0000	67.7236	0.0000	68.7767	0.0000

Source: Author's computation

*Indicates that the coefficient is significant at 5% probability level

** Indicates that the coefficient is not significant at 5% probability level

The estimated panel unit root result in table 4.2 satisfies the pre-condition for panel cointegration test. It is therefore necessary to turn to panel cointegration techniques in order to determine whether a long-run equilibrium relationship exists among the variables.

4.3 Panel Cointegration Result

In order to determine the presence of a cointegrating relationships among the variables, four panel statistics and three group panel statistics tests were estimated using the Pedroni (2004) residual cointegration technique. The test is divided in two sections: the panel statistics and the group statistics. The null hypothesis of the test is no cointegration against the alternative of cointegration. In the first test, it is assumed that a first-order autoregressive term is the same across all the cross sections, while in the case of the group panel statistics, the parameter of the term varies over the cross sections.

Table 3 presents panel and group statistics along with the respective variance ratios and rho statistics (non-parametric tests). The probability value of the panel variance ratio, panel rho statistic, panel PP statistic and panel ADF statistic is above 5% level of significance under no deterministic trend, deterministic trend and intercept and no deterministic trend and intercept. In addition, the probability values of group rho and group PP and group Augmented Dickey Fuller statistic were all above 5% level of significance under deterministic trend and intercept and under no deterministic trend and intercept. However, the group Augmented Dickey Fuller statistic under no deterministic trend, including the panel Augmented Dickey Fuller statistic under the three scenarios are all below 5% level of significance which signifies presence of cointegration among the variables. The results indicate that 7 out of 11 statistics in the first model (with intercept Only), 6 out of 11 statistics in the second model (with Intercept and deterministic trend) and 7 out of 11 statistics in the third model (no intercept and no deterministic trend) are significant at the 5 % level. Thus, rejecting the null hypothesis of no cointegration among the variables at intercept; at intercept and trend; and at no intercept and no trend. Consequently, the Pedroni (1999) test for cointegration rejected that the residuals of the series are integrated at order I(1), suggesting the existence of panel cointegration.

Table 3: Pedroni Residual Cointegration Tests

Alternative hypothesis: common AR coefs. (within-dimension)												
	Intercept				Intercept and trend				No intercept and trend			
			Weighte				Weighte				Weighte	
	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.
Panel Statisti	-0.7078(	0.7605*	-0.74558	0.7720*	-2.00074	0.9773*	-2.05952	0.9803*	0.16224	0.4356*	-0.19568	0.5776*
Panel r Statisti	-0.6918]	0.2445*	-1.45340	0.0731*	1.34677	0.9110*	0.02581	0.5103*	-1.39531	0.0815*	-1.74655	0.0404*
Panel Statisti	-1.9893]	0.0233*	-3.58697	0.0002*	-1.72774	0.0420*	-3.28794	0.0005*	-2.52435	0.0058*	-3.06750	0.0011*
Panel ADF-Statisti	-2.4332(	0.0075*	-3.97706	0.0000*	-4.29523	0.0000*	-4.10044	0.0000*	-2.89639	0.0019*	-3.36542	0.0004*
Alternative hypothesis: individual AR coefs. (between-dimension)												
	Statistic	Prob.			Statistic	Prob.			Statistic	Prob.		
Group rho-Statisti	-2.2107]	0.0135*			-0.54433	0.2931*			-1.30270	0.0963*		
Group Statisti	-4.8931-	0.0000*			-4.09447	0.0000*			-3.53463	0.0002*		
Group ADF-Statisti	-4.9751-	0.0000*			-4.65738	0.0000*			-3.65976	0.0001*		

Source: Author's computation
*Indicates that the coefficient is significant at 5% probability level
** Indicates that the coefficient is not significant at 5% probab level

4.4 Non-linear Autoregressive Distributed Lag Model Estimation

In determining the optimum lag length for the Non-linear Autoregressive Distributed Lag (NARDL) model, the lag selection criteria were employed and Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan Quinn Information Criterion (HQIC) unanimously selected lag order 4 as being suitable to carry out the non-linear ARDL. The AIC was employed as an estimator of prediction error as it was found to be more robust. A lag of four years seems appropriate for the analysis of foreign aid and economic growth due to the frequency policy changes in the WAMZ in a bid to achieve the convergence criteria necessary for the implementation of a common currency in the region. Table 4 presents the asymmetric long and short-run estimates on the effect of positive and negative changes in multilateral and bilateral aid on economic growth using NARDL.

Table 4: Nonlinear ARDL Results
Dependent Variable: D(RPGDP)
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Selected Model: ARDL(4, 4, 4, 4, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long-run Equation				
MAID_POS	2.133311	0.052349	40.75172	0.0000
MAID_NEG	1.743914	0.054372	32.07395	0.0000
BAID_POS	0.060451	0.040394	1.496517	0.1424
BAID_NEG	0.241675	0.040662	5.943535	0.0000
PGR	14.71543	3.771552	3.901691	0.0004
Short-run Equation				
COINTEQ01	-0.581149	0.329426	-1.764126	0.0085
D(RPGDP(-1))	0.301628	0.123118	2.449910	0.0188
D(RPGDP(-2))	-0.065713	0.248618	-0.264315	0.7929
D(RPGDP(-3))	0.027624	0.101522	0.272098	0.7869
D(MAID_POS)	-0.948348	0.789207	-1.201646	0.2366
(MAID_POS(-1))	-0.379553	0.694087	-0.546837	0.5875
(MAID_POS(-2))	0.921036	0.874670	1.053009	0.2987
(MAID_POS(-3))	0.473373	0.504186	0.938887	0.3534
D(MAID_NEG)	-0.712927	0.942112	-0.756733	0.4536
(MAID_NEG(-1))	-0.306263	1.024347	-0.298983	0.7665
(MAID_NEG(-2))	-0.235485	1.004809	-0.234358	0.8159
(MAID_NEG(-3))	-1.656972	1.432903	-1.156374	0.2544
D(BAID_POS)	1.651010	1.454003	1.135493	0.2629
(BAID_POS(-1))	0.693232	0.556958	1.244675	0.2205
(BAID_POS(-2))	0.995803	1.562442	0.637337	0.5275
(BAID_POS(-3))	-1.053290	0.758670	-1.388336	0.1727
D(BAID_NEG)	-3.438196	3.474383	-0.989584	0.3283
(BAID_NEG(-1))	-3.712996	2.864883	-1.296038	0.2024
(BAID_NEG(-2))	-0.253900	0.127277	-1.994866	0.0529
(BAID_NEG(-3))	-1.723051	1.647990	-1.045547	0.3020
D(PGR)	5526.938	5364.355	1.030308	0.3091
D(PGR(-1))	-7315.883	9550.112	-0.766052	0.4481
D(PGR(-2))	2027.969	4558.173	0.444908	0.6588
D(PGR(-3))	2931.785	1722.457	1.702095	0.0965
ean dependent var	32.41938	S.D. dependent var		150.8907
.E. of regression	71.20522	Akaike info criterion		9.050294
um squared resid	202807.3	Schwarz criterion		11.40328
Log likelihood	-621.6493	Hannan-Quinn criter.		10.00545

Source: Author's computation

4.4.1 Long-run Dynamics Results

The long-run coefficients of decomposed multilateral aid series were positive and significant at 5% level. The coefficients of positive and negative partial sums were estimated at 2.13 and 1.74 respectively. More specifically, 1% increase in multilateral aid (MAID_POS) leads to 2.13% increase in the economic growth rate while 1% decrease in the multilateral aid (MAID_NEG) decreases real per capita GDP of the WAMZ to 1.74%. Thus, continuous increase in the flow of multilateral aid leads to an increase economic growth in the WAMZ.

On the other hand, the coefficient of positive and negative partial sums in the flow of bilateral aid were estimated as 0.06 and 0.24 respectively. However, long-run decomposed coefficients of negative changes in the flow of bilateral aid series were positive and significant at the 5% level while the coefficients of positive changes in the flow of bilateral aid series was also positive but, statistically insignificant at 5% level. More specifically, 1% increase in bilateral aid (BAID_POS) has no significant effect on real per capita GDP while 1% decrease in

the flow of bilateral aid (BAID_NEG) leads to 0.24% increase in the economic growth rate of the WAMZ at 5% level. This suggest that decreased flow of bilateral aid stimulates economic growth in the WAMZ while increased flow of bilateral aid is not associated with changes in real per capita GDP. Findings also showed that population growth has a positive and significant long-run impact on economic growth at 5% level of significance.

4.4.2 Short-run Dynamics Results

In the short-run, there is a statistically insignificant inverse relationship between positive and negative changes in the flow of multilateral aid and economic growth at 5% level. The coefficients of positive and negative changes in the flow of multilateral aid at first difference were computed as -0.948 and -0.713 respectively. It is pertinent to state that the relationship between real per capita GDP and decrease in the flow of multilateral aid (MAID_NEG) was inverse and statistically insignificant from first to fourth difference at 5% level. However, the coefficient of increase in the flow of multilateral aid (MAID_POS) was inverse at first and second lag and positive from third and fourth lag but statistically insignificant at 5% level. This shows that both increase and decrease in multilateral aid has no effect on economic growth in the WAMZ in the short-run.

On the other hand, the coefficient of positive changes in the flow of bilateral aid (BAID_POS) at first difference is statically insignificant at the value of 1.651. However, as the lag length increases from first to fourth difference, the magnitude of positive coefficient in respect of BAID_POS declines and changes to inverse. On the other hand, the coefficient of negative changes in the flow of bilateral aid (BAID_NEG) is inverse and statically insignificant at first difference at 5% level of significance. The coefficient of BAID_NEG at first difference is -3.438 but, as the lag length increases, the magnitude of inverse relationship declines to a statistically insignificant coefficient value of -1.723 at fourth difference. This also shows that both positive and negative changes in the flow of bilateral aid have no effect on economic growth in the WAMZ. In summary, all variables were statistically insignificant in the short-run at 5% level.

However, the error correction term (ECT_{t-1}) is important in explaining the speed of adjustment of the model's convergence of short-run disequilibrium to long-run equilibrium. The coefficient, 0.5811 of ECT_{t-1} was negative and statistically significant at 5% level, implying that any shock in the short-run will be corrected in the long-run at a speed of 58.11% per annum. This supports the previous confirmation of long-run cointegration among the variables.

4.5 Granger Causality Results

Table 5: Granger Causality Results

1. Dependent variable: D(RPGDP)			
Excluded	Chi-sq	Df	Prob.
D(MAID)	13.51477	4	0.0090
eD(BAID)	16.37171	4	0.0026
D(PGR)	0.452992	4	0.9779
All	35.62767	12	0.0004
2. Dependent variable: D(MAID)			
Excluded	Chi-sq	Df	Prob.
D(RPGDP)	11.83182	4	0.1086
D(BAID)	9.521427	4	0.0493
D(PGR)	0.911004	4	0.9230
All	32.17219	12	0.0013
3. Dependent variable: D(BAID)			
Excluded	Chi-sq	Df	Prob.
D(RPGDP)	2.010733	4	0.7338
D(MAID)	4.505906	4	0.3418
D(PGR)	0.264977	4	0.9920
All	6.642489	12	0.8803
4. Dependent variable: D(PGR)			
Excluded	Chi-sq	Df	Prob.
D(RPGDP)	0.892495	4	0.9256
D(MAID)	4.080881	4	0.3952
D(BAID)	0.855145	4	0.9309
All	4.384152	12	0.9755

Source: Author's computation

There are 4 short-run granger causality estimation results in table 5. The result of the first granger causality estimation shows that at 5% significance level there is a short-run causality running from multilateral aid to real per capita GDP (MAID → rPGDP) and from bilateral aid to real per capita GDP (BAID → rPGDP). However,

there is no short-run causality running from population growth rate to real per capita GDP. This shows that bilateral and multilateral aid variables multilateral aid provide useful information about the future values of rPGDP in the WAMZ. In the second estimation, there is no reverse causality or simultaneity between rPGDP and multilateral aid. Similarly, there is no causality running from population growth rate to multilateral aid. However, there is substantial evidence of a unidirectional causality running from bilateral aid to multilateral aid (BAID → MAID). The third estimation shows that there is no reverse causality among the variables as multilateral aid, bilateral aid, growth rate of population and real per capita GDP do not predict the flow of bilateral aid in the WAMZ. Similarly, the fourth estimation also shows the absence of a short-run causality running from rGDP, multilateral aid and bilateral aid to population growth rate. Thus, the variables do not predict the growth rate of population in the WAMZ.

4.6 Residual Diagnostics Test

To ascertain robustness and stability of the model estimation, several residual-based diagnostics were performed and at lag 4, the model was found to be free from cross sectional dependency (correlation), error terms were normally distributed. The cumulative sum of recursive residuals (CUSUM) and CUSUM of squares were used to test for stability. Figure 3 shows that the CUSUM and CUSUM of squares line passes through the upper and lower bounds which confirms the dynamic stability of the model.

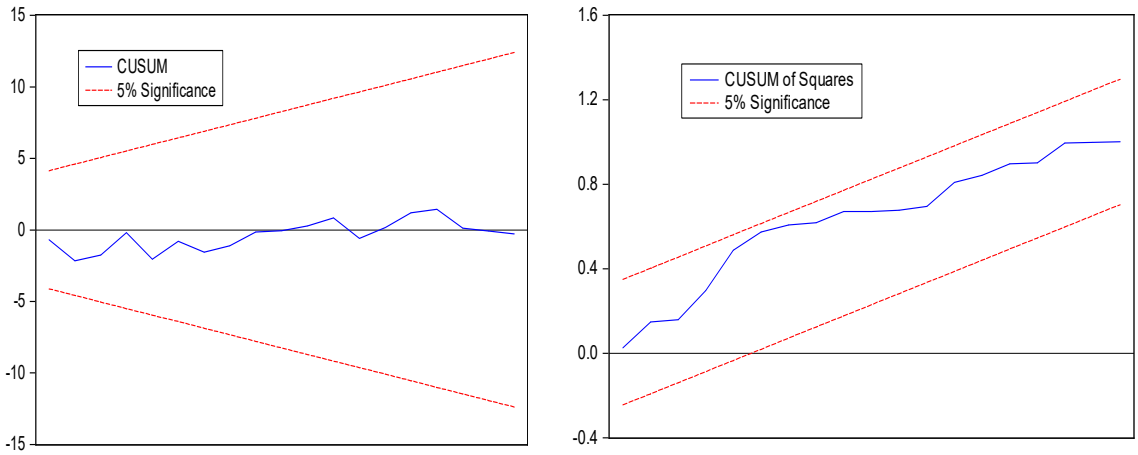

Figure 3: CUSUM and CUSUM of squares of recursive residuals
Source: Author's computation

The cross-sectional dependency (correlation) result presented in table 6 shows that there is no serial correlation as the probability value was greater than 5% level of significance.

Table 4: Residual Cross-Section Dependence Test

Test	Statistic	df.	Prob.
Breusch-Pagan LM	0.065453	10	0.1700
Pesaran scaled LM	0.260603		0.0920
Pesaran CD	0.276547		0.2280

Source: Author's computation

5. Conclusion and recommendation

The study analyses the pattern of asymmetric relationship between foreign aid, disaggregated into bilateral and multilateral aid and economic growth in the WAMZ. There is compelling evidence to suggest that increase in the flow of multilateral aid and decrease in bilateral aid accelerates long-run economic growth in the five WAMZ countries. However, there was no evidence to suggest that increase in bilateral aid supports long-run economic growth in the WAMZ. Evidence from the short-run dynamics shows no indication that multilateral and bilateral aid impact economic growth in the WAMZ. The results also showed absence of reverse causality and unidirectional relationship running from multilateral and bilateral aid to economic growth.

It is important to note that multilateral organisations are a diverse set of actors that are neutral from a political standpoint, providing the space for the development of global partnerships, pooling resources upstream, setting standards, and facilitating cross-border operations among multiple stakeholders. Previous research have also shown that multilateral aid has been proven to have advantages in supporting development outcomes as a result of its development orientation and conditionality of aid on development-supportive reforms (Burnside and

Dollar (2000). There is also substantial evidence to state that multilateral aid is more effective in stimulating long-run economic growth than bilateral aid as multilateral aid tends to be aligned with non-political development orientation of the multilateral agencies, whereas bilateral aid often serves political interests rather than economic growth of the WAMZ. (Biscaye, Reynolds and Anderson, 2017). Therefore, multilateral channels would be best suited if donors and recipients wanted to tackle economic challenges and take collective steps to reduce poverty and stimulate economic growth of the WAMZ. Thus, if the WAMZ is truly interested in promoting effective economic growth, aid allocation patterns should be altered in such a way that more aid is channeled multilaterally as the impact of bilateral aid has shown disappointing results. Consequently, aid donors would have to reconsider their aid policies by channeling their assistance through multilateral agencies in order to best address the economic growth challenges that remains throughout the WAMZ.

On the other hand, bilateral aid has not proved any basis to be relied upon as it has shown its inability to stimulate economic growth and stabilize the deteriorating economic conditions in the WAMZ. From a strategic planning point of view, our results would reject any conservation policy suggesting that increased flow of bilateral aid accelerates long-run economic growth in the WAMZ. In view of this, bilateral donors should leverage on the technical expertise of multilateral aid agencies and channel their assistance through intermediary development partners and institution like IMF, United Nations, and World Health Organization etc for onward disbursement to the aid recipient countries in the WAMZ. It is also important to state that knowledge and ideas are key ingredients in economic growth and multilateral development organisations have specialised staffs with a wealth of experience needed to administer aid. Therefore, bilateral donors should engage the services of multilateral agencies for the purpose of aid administration and disbursement as they are best-equipped to conduct analytical, diagnostic, and capacity-building activities to stimulate economic growth in the WAMZ.

Finally, in order to bolster the WAMZ's economic growth, ministries of finance in the WAMZ should invest more heavily in education and human capital development in order to improve the quality of its workforce. This can be achieved through a more accessible and qualitative secondary education and universal basic primary education which will give the WAMZ the human capital boost necessary to bring large segments of its population out of poverty. Ministries of education within the WAMZ must join hands to ensure that all girls and boys have access to free, equitable, and quality primary and secondary education that leads to relevant and effective learning outcomes.

6. Acknowledgement:
Special appreciation to Dr. (Mrs). Gloria U. Igwe for her contribution to this study.

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