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What Are The Growth Effect of Foreign Direct Investment And Trade in WAMZ?

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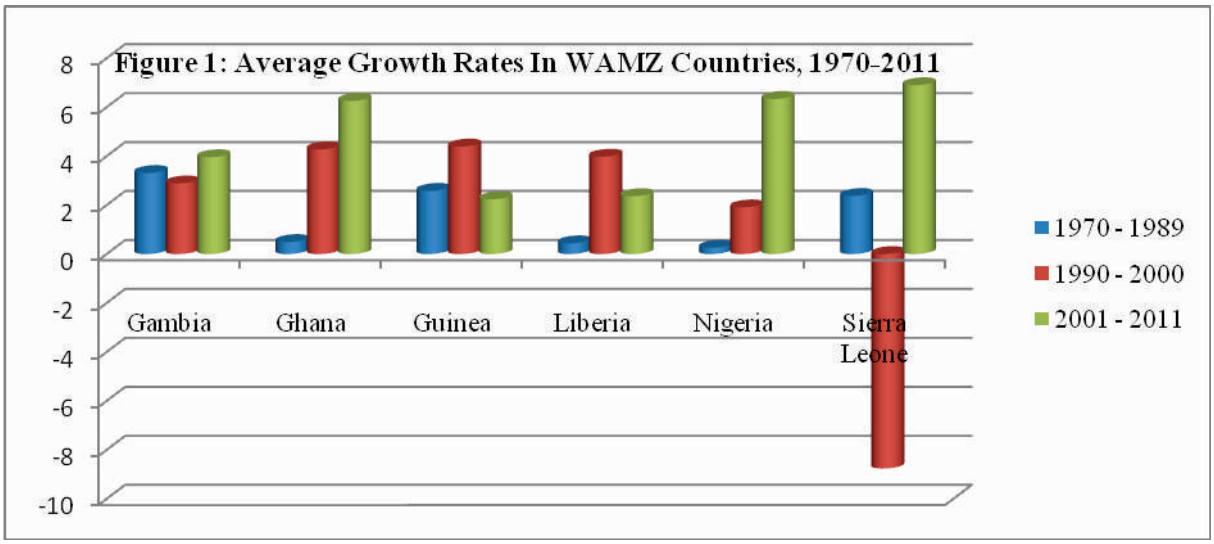
Abstract
This study contributes to the debate about the impact of FDI and trade on growth using current panel data (1980-2010) from the WAMZ nations. Using a variety of modern estimation techniques, our overall findings showed that FDI has a significant positive impact on growth in the WAMZ. This impact was robust and unambiguous in all the alternative estimations that adjusted for the problem of feedback between FDI and growth as well as between trade and growth. However, the impact of trade on growth in the WAMZ was found to be negative- a result that tends to portray current un-favorable trade composition in the zone. In conclusion, we caution that until the current trade composition (characterized by persistent trade deficits, export of primary products, overdependence on imports, etc.) is reversed, countries in WAMZ may not be able to effectively use trade to record any significant growth in their economies.
Key words: WAMZ, FDI, Panel Data, Growth
JEL Code: C33, F41

1. Introduction

SINCE 1980s, when the remarkable growth recorded by the Asian Newly Industrialized Countries (ANICs) was attributed, among other things, to their export promotion oriented policies, greater emphasis and efforts have been increasingly placed on replicating the Asian "growth miracle" in other developing countries. Consequently, by late 1980s, a number of countries in Africa embarked upon major trade policy reforms and market friendly initiatives with major emphasis on trade liberalization and reduction of trade barriers. Available data from UNCTAD (2012) indicates that for most countries in Sub-Saharan Africa (SSA), economic growth had remained sluggish and unimpressive since the late 1970s and early 80s. For instance, the region recorded an average growth rate of 3.2% in the period 1970-1980 and thereafter decline precipitously to about 1.4% in the period 1980-1989. The situation was not different in the West African sub-region and particularly countries in the West African Monetary Zone (WAMZ). This is in spite of the concerted efforts by the Economic Community of West African States (ECOWAS), established in 1975 to accelerate economic growth in the region through trade and monetary integration.

Interestingly, by early 1990s, most countries in the SSA registered some positive growth trend. For instance, available data indicates that the average growth rate in SSA which stood at 1.4% in 1980-1989, rose to 2.5% in the period 1990-2000 and thereafter to 5.2% in the period 2001-2011 (UNCTAD, 2012). Some studies (e.g. Rodrik, 1998) have attributed the gradual growth recovery in SSA from the early 1990s to these reforms efforts. However, a closer view of values of real GDP growth rates in WAMZ countries between 1970 –2011 indicates that in spite of these reforms efforts, the growth trajectory were not uniform across countries in the WAMZ (UNCTAD, 2012). For instance, while Ghana and Nigeria were able to sustain their average growth throughout the period under review, there were considerable fluctuations in the average growth performance of Guinea, Gambia, Liberia and Sierra Leon within the same period (see Fig. 1). This puzzling observation seems to reinforce the doubt about the role of trade on growth, and thus opening up some research issues.



Source: UNCTAD, 2012.

Curiously also, although the positive relation between trade and economic growth seems overwhelming, at least in theory, empirical evidence remains mixed and sometimes conflicting. In a comprehensive survey of over 150 papers by Giles and Williams (2000), it was surprisingly found that there is no obvious agreement to whether the causality dictates export lead-growth (ELG) or growth lead-export (GLE) hypotheses. This simply indicates that the debate is far from being conclusive.

Most importantly, skepticism about the effect of trade on growth, especially in developing countries such as in the WAMZ, has continued to grow. This arises primarily from the aged-long premises put forward by Prebisch (1950) and Singer (1950). First, it has been argued that the structure of trade, under which exports are concentrated on a few primary products and imports are constituted mostly by manufactured goods, tend to render developing countries overtly dependent and vulnerable. Due to the low price elasticity of developing countries' export products and the fact that the demand for primary products are contained in the international market, developing economies may continuously face deteriorating terms of trade and poor growth performance. Thus, while it may be plausible to expect a positive relationship between the variables in developed countries, such a relationship in developing countries remains blurred and begged for an empirical quest.

Another issue of interest is the role of FDI on economic growth within the WAMZ economies. In spite of the perceived positive role of FDI on growth, its role in promoting economic growth, especially in developing countries, has also been highly debated. Available statistics indicates that there have been some substantial inflows of FDI in the SSA. The United Nations Conference on Trade and Development, UNCTAD (2007) reports that FDI flows to Africa has increased from $9.68 million in 2000 to $1.3 trillion in 2006. Recent report (from UNCTAD, 2012) shows that as at 2011, FDI as a percentage of GDP in Guinea was as much as 24.3% and in Ghana (8.4%), Nigeria (3.8%), Gambia (3.5%) and Sierra Leone (2.0%). This compares favorably with the values in 1998, where none of the country registered any share above 1%, except Nigeria (3.4%) and Gambia (2.8%). In spite of this trend, countries in the WAMZ have continued to witness a not-too-impressive growth. Guinea which had one of the highest percentage of FDI in GDP, paradoxically witness a declining trend in its average growth levels from 4.4% in the period 1990-2000 to 2.2% in the period 2001-2011. This is a sharp contrast to Nigeria's average levels of 1.9% and 6.3% respectively within the same period. This logically raises the question about the presumed connection between FDI and growth.

Empirically, evidence of FDI on growth remains divided. For instance, while Borensztein, *et al.* (1998) and Carkovic and Levine (2005) found that FDI does not have an unmitigated and positive effect on economic growth, other studies like Kokko, *et al.* (1996) and Alfaro, *et al.* (2004) obtained positive evidence. In the midst of this ambiguity, an interesting research issue that has emerged in the literature is the possible role of host country's characteristics. For instance, while Wu and Chih-Chiang (2005) and Borensztein, *et al.* (1998) maintained that the contribution of FDI to growth is enhanced by its interaction with the level of human capital in the host country, Blomstrom, *et al.* (1994) posit that FDI is only positive and significant only for higher income countries and that it has no impact on lower income countries.

This study is in response to aforementioned research issues. Specifically, the paper seeks to examine the impact of FDI and trade on economic growth in the WAMZ over the period 1980 to 2010. The rest of the paper is structured as follows. The next section presents the model and discusses the data issues. Thereafter, the econometric methods adopted for the estimation are discussed. This is followed by the presentation and discussion of the empirical results. The last section concludes with some useful policy recommendations.

2. The Model and Data

In order to investigate the possible growth promoting effects of both FDI and Trade, we utilized the aggregate neoclassical production function framework specified as follows:

$$Y_{it} = A_{it}K_{it}^{\alpha}L_{it}^{\beta} \qquad (1)$$

Where i=1,…, N for each country in the panel, t =1,…,T, refers to the time period. Y denotes the aggregate production of the economy, A, K, and L denotes the total factor productivity (TFP), capital stock, and stock of labour respectively. Our specification is in the spirit of endogenous growth models of Romer (1990) and Nelson and Phelps (1966), a variant of which have been applied in several studies including Borensztein, *et al* (1998) and Akinlo (2004). Specifically, following Bhagwati's hypothesis, we assumed that foreign direct investment (FDI), trade and other factors influence the behaviour of TFP (see Bhagwati, 1988 and Ewards, 1993). Thus:

$$A_{it} = f\left(FDI_{it}^{\emptyset}Trade_{it}^{\delta}C_{it}\right) \qquad (2)$$

Removing the functional notation, equation (2) can further be expressed in its multiplicative form as

$$A_{it} = FDI_{it}^{\emptyset}Trade_{it}^{\delta}C_{it} \qquad (3)$$

Substituting equation (3) into equation (1), we have:

$$Y_{it} = C_{it}K_{it}^{\alpha}L_{it}^{\beta}FDI_{it}^{\emptyset}Trade_{it}^{\delta} \qquad (4)$$

To estimate equation (4) we take the natural logs of both sides to have:

$$Y_{it} = C_{it} + \alpha\ln K_{it} + \beta\ln L_{it} + \emptyset\ln FDI_{it} + \delta\ln Trade_{it} + \varepsilon_{it} \qquad (5)$$

Where α , β , ϕ and δ are the long-run elasticity coefficients of output with respect to *K, L, FDI* and *Trade,* while ε_{it} is the serially uncorrelated error term. However, as pointed out by Won, *et al,* (2008), exports (or trade) is also theoretically expected to increase FDI by paving way for FDI through a reduction in investors' transaction costs in terms of knowledge of the host country's market structure. Moreover, inflows of FDI are expected to trigger an improvement in the competitiveness of the host countries' export potentials (Blomstrom and Kokko, 1998). Thus to avoid multicollinearity problem, *FDI* and *Trade* are entered separately into equation (5). Further, we control for External Debt Service capacity (*Debtserv),* Human Capital Stock (*Humcap),* initial GDP (*iniGDP)* and Government Size (*Govsize).* To check if *FDI* influences growth through its interaction with human capital stock in the host country, we include the interaction term, (*FDI*Humcap*). Specifically, the models we hope to estimate are specified as follows:

$$Y_{it} = C_{it} + \alpha\ln K_{it} + \beta\ln L_{it} + \emptyset\ln FDI_{it} + \partial\ln Humcap_{it} + \varphi\ln Govsize_{it} + \vartheta\ln IniGDP_{it} + \pi\ln Debtserv_{it} + \varepsilon_{it} \qquad (6)$$

$$\alpha, \beta, \emptyset, \partial, \varphi > 0;\ \vartheta, \pi < 0$$

$$Y_{it} = C_{it} + \alpha\ln K_{it} + \beta\ln L_{it} + \emptyset\ln FDI_{it} + \partial\ln Humcap_{it} + \varphi\ln Govsize_{it} + \vartheta\ln IniGDP_{it} + \pi\ln Debtserv_{it} + \omega\ln(FDI * Humcap)_{it} + \varepsilon_{it} \qquad (7)$$

$$\alpha, \beta, \emptyset, \partial, \varphi, \omega > 0;\ \vartheta, \pi < 0$$

$$Y_{it} = C_{it} + \alpha\ln K_{it} + \beta\ln L_{it} + \delta\ln Trade_{it} + \partial\ln Humcap_{it} + \varphi\ln Govsize_{it} + \vartheta\ln IniGDP_{it} + \pi\ln Debtserv_{it} + \varepsilon_{it} \qquad (8)$$

$$\alpha, \beta, \partial, \varphi, > 0;\ \delta \gtrless 0;\ \ \vartheta, \pi < 0$$

Our dependent variable, output (Y) is measured by Real GDP per capita and is included in specifications in its log form. The data was extracted from the *World Development Indicators/Global Development Finance (WDI-GDF)* database, 2012.

Capital stock (K) is proxied by gross domestic capital formation and was extracted from the *World Development Indicators/Global Development Finance (WDI-GDF)* database, 2012. Usually, this variable is expected to exert a positive influence on growth and its coefficient is thus expected to be positive in all the models.

Stock of labour (L) is proxied by population and it enters into the model in its log form. Also, this variable was extracted from the *Penn World Table, version 7.1*. In line with the neoclassical production theory, we expect a positive influence of labour on output and the variable is thus expected to be positive in its coefficient.

Foreign direct investment (*FDI*), which is one of our key variables of interest, is theoretically postulated to be growth promoting, although the empirical evidence as we earlier reviewed, remains divided. To proceed, we aligned with the theory that *FDI* is positively linked to growth by augmenting domestic capital and as a channel of technology transfer and managerial knowhow. Thus our expectation is that its coefficient would be positive.

The variable was gotten from the United Nations Conference on Trade and Development (UNCTAD) database, 2012.

Human capital stock (*Humcap*) is proxied by gross primary school enrollment rate, extracted from the *World Development Indicators/Global Development Finance (WDI-GDF)* database, 2012. The coefficient of this variable is expected to be positive as a country with a higher human capital stock is theoretically expected to register higher growth. In the same vein, the interaction of this variable with *FDI* (*FDI*Humcap)* is also expected to be positive. This is because *FDI* is expected to flow into countries with higher human capital stock.

Government size (*Govsize*) is measured as government consumption expenditure as a ratio of GDP and was extracted from *World Development Indicators/Global Development Finance (WDI-GDF)* database, 2012. Usually, higher government spending, in line with Wagner's law of government spending as well as Keynesians fiscal stimulus package for growth prescription, is expected to trigger higher growth. Although there are arguments in the literature concerning the optimal government size and the crowding out-effect of government spending, we view this later thinking as less applicable in developing countries that are still grappling with slow and poor growth rates. Base on these, we postulate that *Govsize* would have a positive influence on growth and thus, its coefficient is expected to the positive.

All else equal, *Trade* should have a positive effect on growth. However, due to the low price elasticity of developing countries' export products and the fact that the demand for primary products are contained in the international market, developing economies may continuously face deteriorating terms of trade and poor growth performance. While it is plausible to expect a positive relationship between the variables in developed countries, such a relationship in developing countries remains blurred. Thus our expectation about the behavior of this variable on growth is ambiguous. The variable was obtained from *World Development Indicators/Global Development Finance (WDI-GDF)* database, 2012

Finally, Debt serving capacity (*Debtserv)* and the initial GDP (*IniGDP*) are all expected to be negative in their coefficients. *Debtserv* could constrain a country from spending on growth promoting projects as it reduces domestic spending capacity. The variable was extracted from *World Development Indicators/Global Development Finance (WDI-GDF)* database, 2012. On the other hand, following the convergence club prediction, countries with lower initial GDP tends to grows faster than those with higher initial GDP. Thus we expect that its coefficient should be negative on growth. The variable is measured as the log of real GDP per capita in the initial period.

3. Econometric Methodology

3.1 Panel Unit Root Tests

For confirmatory evidence, we conduct a battery of panel unit root tests. These include that of Levin, *et al* (2002), Breitung (2002), Im, *et al.* (2003) tests, as well as the ADF Fisher Chi-square test (Dickey and Fuller, 1979) and Phillips-Perron (PP) Fisher Chi-square (Phillips and Perron, 1988). While the Levin, *et al* (2002) and Breitung (2002) tests assume a common unit root process as their null hypotheses, the Im, *et al.* (2003), Hadri (2000), the ADF Fisher Chi-square and Phillips-Perron (PP) Fisher Chi-square tests assume the presence of individual unit root processes as their null hypotheses.

Specifically, for a brief exposition, the Im, *et al.* (2003) panel unit root test allows for heterogeneous autoregressive coefficients. It averages the augmented Dickey-Fuller (ADF) unit root tests of the respective variables while allowing for different orders of serial correlation, $\varepsilon_{it} = \sum_{j=1}^{p_i} \varphi_{ij}\, \varepsilon_{it-j} + u_{it}$, in the following:

$$y_{it} = \rho_i y_{it-1} + \sum_{j=1}^{p_i} \varphi_{ij}\, \varepsilon_{it-j} + \delta_i X_{it} + u_{it} \qquad (9)$$

Where i = 1,…, N for each country in the panel; t = 1,…, T refers to the time period; X_{it} represents the fixed effects or individual time trend in the model; ρ_i are the autoregressive coefficients; p_i represents the number of lags in the ADF regression; and ε_{it} are the error terms. If $\rho_i < 1$, y_{it} is considered weakly trend stationary whereas if $\rho_i = 1$, then y_{it} contains unit root. The null hypothesis is that each of the series in the panel contains a unit root, while the alternative is that at least one of the individual series in the panel is stationary.

On the other hand, the ADF Fisher Chi-square test combines the p-values of the test statistic for a unit root in each residual cross-sectional unit. The test is non-parametric and has a chi-square distribution with 2N degrees of freedom, where the N stands for the number of cross sectional units or countries in the panel. Using the addictive property of the chi-squared variable, the following test statistic can be derived:

$$\lambda = -2\sum_{i=1}^{N} log_e \pi_i \qquad (10)$$

Were π_i represents the *p*-value of the test statistic for unit *i.* One of the main advantage of this test over Im, *et al.* (2003) is that it does not depend on different lag lengths in the individual ADF regression.

The Breitung panel unit root test has the following form:

$$y_{it} = \alpha_{it} + \sum_{k=1}^{p+1} \beta_{ik} X_{i,t-k} + \varepsilon_t \qquad (11)$$

Based on equation (11), the Breitung test statistic tests the null hypothesis that the process is difference stationary: that is, $H_0: \sum_{k=1}^{p+1} \beta_{ik} - 1 = 0;$ while the alternative hypothesis assumes that the panel series is stationary: $H_1: \sum_{k=1}^{p+1} \beta_{ik} - 1 < 0$ for all *i.*

For a detailed review of the other test procedures, see Choi (2001).

3.2 Panel Cointegration

After testing for panel unit root, we proceed to examine whether there is a long-run relationship between the variables using two sets of tests for panel cointegration proposed by Pedroni (2004). To test the null hypothesis of no cointegration, $\rho_i = 1$, the following unit root test is carried out on the residuals:

$$\varepsilon_{it} = \rho_i \varepsilon_{it-1} + w_{it} \qquad (12)$$

The tests are based on within panel and between group dimensions approaches. The within dimension approach includes four statistics: panel v-statistic, panel ρ-statistic, panel PP-statistic, and panel ADF-statistic. These statistics pool the autoregressive coefficients across different countries for the unit root tests on the estimated residuals taking into account common time factors and heterogeneity across countries. On the other hand, the between dimension approach includes three statistics: group ρ-statistic, group PP-statistic, and group ADF-statistic. These statistics are based on averages of the individual autoregressive coefficients associated with the unit root tests of the residuals for each country. All the seven tests are distributed asymptotically as standard normal. Of all the seven tests, the panel v-statistic is a one-sided test where large positive values reject the null hypothesis of no cointegration while large negative values for the remaining test statistics reject the null hypothesis.

3.3 Panel Long-Run Estimates

If a long-run cointegrating relationship between the variables is established, equations (6) – (8) can safely be estimated through appropriate techniques. For a robust analysis, we applied several estimation methods to the models. First, we run the pooled OLS regression on the models. To determine the appropriate panel regression specification to use, we applied the traditional Hausman specification test. This test enables us to determine whether to use the random effect model (REM) or the fixed effect model (FEM). The null hypothesis underlying the Hausman test is that the REM and FEM do not differ substantially (see Gujarati and Porter, 2009). If the null hypothesis is rejected, the conclusion is that the REM is not appropriate because the random effects are probably correlated with one or more repressors. In such instance, the FEM will be preferred to the REM.

Next, giving the likely simultaneity problem between FDI and growth as well as between trade and growth, we applied the two-stage least squares (2SLS) method of estimation[1] and compared the results with those of the OLS. To further take care of the possibility of endogeneity in the relationship and for robustness check, we applied the panel dynamic ordinary least squares (DOLS) estimation method proposed by Pedroni (2004). This method involves augmenting equations (6) – (8) with lagged differences of the regressor (which are *I*(1) stationary) to control for endogenous feedback. To get an overview of this methodology, consider the

[1] The main problem with the use of instrumental variable (IV) method lies with the fact that it is difficult to find instruments that are both good at predicting the variable of interest and yet are not determinants of the dependent variable.

regression $y_{it} = \alpha_{it} + \beta_i X_{it} + \mu_{it}$ such that y_{it} is output (real GDP per capita) and X_{it} represents a vector of explanatory variables, the augmentation is such that:

$$y_{it} = \alpha_{it} + \beta_i X_{it} + \sum_{p=-p_i}^{p_i} \gamma_{ip} \Delta X_{it-p} + \mu^*_{it} \qquad (13)$$

The introduction of ΔX_{it-p} term in the above equation helps to account for possible endogeneity of the explanatory variables (see Chuku and Akpan, 2012).

4. Empirical Results And Discussion

4.1 Unit Root and Co-integration Test Results

Table 1 displays the results for the various types of panel unit root tests conducted on each of the series. The Schwarz criterion was used to select the optimal lag difference term while the Newey-West method and the Bartlett Kernel method was employed to determine the bandwidth selection. Since we employed a plethora of unit root test criteria, we elect to use the simple majority vote criterion to determine the order of integration of the series. In other words, given the six types of unit root test technique, if more than three of the tests lead to a particular conclusion, we go with that conclusion. The overall analysis of the results as presented in Table 1 indicate that five of the variables are *I*(1) stationary, while the rest are stationary at levels. In specific term, capital stock, government size, human capital, stock of labour, and trade are found to be stationary at their first difference while growth, FDI and debt service, are *I*(0) stationary.

Since the variables have different orders of integration, we proceed to check if a unique co-integration relationship could be established among the variables. The results for this exercise are contained in Table 2. Two categories of tests for cointegration are reported: the within (panel) and between (group) dimensions statistics. The overall conclusion from the analysis is that there is at least one co-integrating relationship between our included variables. This conclusion is statistically supported by the PP and ADF statistics.

Table 1: Panel Unit Root Test Results

Variable	LLC	Breitung t-stat	IPS	ADFFC	PPFC	Hadri
Y	-5.02(0.00)***	-4.33(0.00)***	-5.37(0.00)***	54.94(0.00)***	53.28(0.00)***	2.48(0.01)**
Debtserv	-1.07(0.14)	-3.39(0.00)***	-1.14(0.13)	23.59(0.02)**	35.04(0.00)***	2.16(0.02)**
Δ*Debtserv*	-13.82(0.00)***	-12.05(0.00)***	-13.31(0.00)***	138.18(0.00)***	162.62(0.00)***	4.75(0.00)***
K	-0.71(0.24)	0.57(0.72)	0.13(0.55)	12.55(0.40)	15.73(0.20)	7.15(0.00)***
Δ*K*	-13.42(0.00)***	-9.47(0.00)***	-12.16(0.00)***	126.84(0.00)***	154.4(0.00)***	-0.01(0.51)
Govsize	1.09(0.86)	-0.79(0.21)	1.17(0.88)	10.54(0.57)	10.19(0.59)	6.47(0.00)***
Δ*Govsize*	-7.14(0.00)***	-4.91(0.00)***	-7.51(0.00)***	91.13(0.00)***	133.88(0.00)***	4.43(0.00)***
Humcap	0.75(0.77)	0.85(0.80)	1.40(0.92)	9.25(0.68)	3.88(0.99)	6.21(0.00)***
Δ*Humcap*	-6.80(0.00)***	-3.97(0.00)***	-5.87(0.00)***	56.37(0.00)***	61.54(0.00)***	-0.34(0.63)
L	6.68(1.00)	2.78(0.99)	10.51(1.00)	1.96(0.99)	0.11(1.00)	9.27(0.00)***
Δ*L*	1.44(0.93)	-0.18(0.43)	-6.92(0.00)***	71.13(0.00)***	38.12(0.00)***	3.71(0.00)***
FDI	-3.73(0.00)***	-2.77(0.00)***	-3.66(0.00)***	35.36(0.00)***	44.74(0.00)***	4.18(0.00)***
Trade	-1.16(0.12)	-0.86(0.19)	-1.39(0.08)*	18.07(0.11)	17.52(0.13)	5.73(0.00)***
Δ*Trade*	-11.59(0.00)***	-9.23(0.00)***	-12.80(0.00)***	132.33(0.00)***	142.30(0.00)***	-0.80(0.79)

Notes: *LLC = Levin, Lin and Chu test; IPS =Im, Pesaran and Shin W-stat; ADFFC = Augmented Dickey Fuller Fisher Chi-square test;*

*PPFC = Philips and Perron Fisher Chi-square test; *, **, and *** denotes significance at 10%, 5% and 1% respectively. Values in bracket are the P-values.*

Table 2: Pedroni Panel Co-Integration Test Results

Test Statistics	Within Dimension (Panel statistics)	Between Dimension (Group statistics)
V-statistic	-2.99(0.99)	
Rho-statistic	3.15(0.86)	1.44(0.93)
PP-statistic	-1.08(0.00)***	-7.51(0.00)***
ADF-statistic	1.60(0.00)***	-2.96(0.00)***

Notes: *estimation assumes no deterministic trend; automatic lag length selection was based on SIC with a max lag of 5; Newey-West automatic bandwidth selection and Bartlett kernel was used; *, **, and *** denotes significance at 10%, 5% and 1% respectively. Values in bracket are the P-value*

4.2 FDI, Trade and Growth in WAMZ: Estimated Results

4.2.1 Pooled OLS and Fixed Effect Estimation

Table 3 shows the empirical results of the impact of FDI and trade on economic growth in WAMZ. Some of the variables enter into the model with a lag to correct for any autocorrelation effect and policy inertia. The first three columns contain the results based on a pooled OLS estimation, which ignores any possible endogeneity effect. Interestingly, most of the variables conform to the theoretical expected signs of their coefficients. The analysis shows clearly that FDI has a significant positive effect on growth, except when the interaction term was included. This result is consistent with what was discovered in previous studies like Borensztein, *et al* (1998) and De Gregorio (1992) for other developed and developing economies. Further, the results contained in column 2 indicate that the impact of FDI on growth is significantly negative, which is not an expected result. However, the result reveals that FDI significantly promotes growth through its interaction with human capital stock, a result that is similar to what Wu and Chih-Chiang (2005) obtained for a panel of 62 countries.

Looking at column 3, we found that trade has significant negative impact on growth in the WAMZ. This result could be attributed to the low price elasticity of developing countries' export products and the fact that most of the countries in the zone have continue to face deteriorating terms of trade. In principle, a situation where the countries continue to record excessive import bills (of manufacturing products vis-à-vis the exports of their primary products is not growth promoting.

The results for the control variables are quite satisfactory, although some do not conform to the a priori expectations concerning the signs of their estimated coefficients. For instance, debt service, labour, and capital stock variables all turn up with the wrong signs. In contrast, human capital stock has the expected sign; higher human capital positively and significantly contributes to growth. This result is consistent in almost all the specifications. All else equal, it goes to show that countries with higher human capital stock have the potential to record higher growth. The relationship between initial GDP and growth is negative but insignificant at the conventional 5% level. The negative coefficients obtained tend to lend credence to the existence of the convergence club within the zone. Government size also has an expected positive and significant coefficient. This rejects the crowding-out hypothesis but supports the fact that higher government size is growth inducing. This finding corroborates what Akpan and Abang (2013) obtained for Nigeria. The result further implies that countries in the zone should not de-emphasize the importance of government spending in favour of a free market economy; government spending is required to stimulate the countries to higher growth.

Table 3: Impact of FDI, Trade on Economic Growth in WAMZ: Panel LS Regressions

Dependent Variable: Log of Real GDP per capita (*Y*)						
	Pooled OLS			Fixed-Effect		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Const.	-5.1328**	-4.8725**	-2.1939	-11.620	-9.189	-34.369***
	(-2.615)	(-2.500)	(-0.722)	(0.264)	(-0.908)	(-2.735)
$Debtserv_{t-1}$	0.2351	0.2241	0.3597***	-0.0289	0.0031	-0.0265
	(1.105)	(1.079)	(3.326)	(0.8026)	(0.030)	(-0.201)
K_{t-1}	-0.5110**	-0.5673***	0.0516	-0.6501***	-0.696***	-0.634**
	(-2.624)	(-4.503)	(0.183)	(-3.420)	(-3.240)	(-2.456)
$Govsize_{t-1}$	0.3472**	0.3986***	0.0381	0.4932***	0.558***	0.3668*
	(2.011)	(3.476)	(0.157)	(3.785)	(3.827)	(1.821)
$Humcap$	2.299***	2.2478***	2.7809***	1.4304**	2.103**	0.224
	(3.649)	(3.553)	(3.289)	(2.094)	(2.276)	(0.587)
$IniGDP_{t-1}$	-0.4586	-0.5025	-0.3611*			
	(-1.015)	(-1.158)	(-1.706)			
L	-0.2133**	-0.2127**	-0.361***	0.4334	0.0936	2.261***
	(-2.267)	(-2.558)	(-6.695)	(0.538)	(0.107)	(2.256)
FDI_{t-1}	0.1165***	-0.5714**		0.1249***	0.129***	
	(8.191)	(-2.219)		(6.812)	(7.838)	
$(FDI * Humcap)_{t-1}$		0.1564**			-0.001	
		(2.643)			(-0.241)	
$Trade_{t-1}$			-1.0844**			-0.262
			(-2.373)			(-1.174)
DW	2.054	2.099	1.956	1.935	1.988	1.772
Adj. R-square	0.3502	0.4371	0.214	0.399	0.401	0.273
F-Stat.	6.544***	5.7859***	3.927***	7.697***	6.914***	4.935***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)

Notes: *estimation is based on Robust (HAC) standard errors; *, **, and *** denotes significance at 10%, 5% and 1% respectively. Values in bracket for the estimated coefficient are the t-statistics while those for the F-stat are the P-values.*

In the alternative panel specification, the fixed effect model was preferred to the random effect model based on Hausman's specification test, which returns a very low probability value of 0.002[2]. The estimated results using the fixed effect specification are reported in columns 4 to 6 in Table 3. Generally, the results tend to be consistent with the pooled OLS estimation, except that debt service and labour stock now appear with the correct signs. However, even when debt service now has a negative impact on growth, such impact is not statistically significant. Interestingly, the impact of FDI on growth remains positive and significant, while that of trade is still negative, although insignificant.

4.2.2 Instrumental Variable Regression: 2SLS Results

To address the potential problem of feedback effect, Table 4 reports the alternative results based on the instrumental variable method (2SLS). Although the choice of appropriate instruments is very problematic, we finally included as instruments for the FDI estimation, a constant term, lag values of the dependent variable, infrastructure (proxied number of telephones lines), degree of openness, inflation and exchange rate.

We test for the validity of the instruments using the Sargent over-identification test. The null hypothesis for this test is that all the instruments are valid against the alternative that they are not. Based on the results reported at the bottom of the table, we do not have sufficient evidence to reject the null. Also, we employed the Hausman's asymptotic chi-square test to check for the validity of the estimates. The null hypothesis here is that the OLS estimates are consistent (or in other words estimation by means of instrumental variables is not really required). The results of this test as reported also at the bottom of the table clearly do not give us sufficient statistical evidence to accept the null hypothesis, except under the last estimation in column 3. With these, we are relatively confident on the robustness of the estimates.

Most of our variables now appear with their expected signs. Most importantly, one of our key variables of interest in this study (FDI) is well behaved with a correctly signed and significant coefficient. However, the interaction of FDI with human capital is not only wrongly signed but insignificant. The impact of trade on growth remains negative and insignificant, which is consistent with our earlier findings. This further indicates that while the impact of FDI on growth in the region is unambiguously positive and significant, trade may not be

[2] This result is not shown here but it is available upon request.

a good explanatory variable for growth in the WAMZ region contrary to the predictions of the export-lead growth (ELG) thesis. Again, this result may not be divorced from the persistent trade deficit recorded by most countries in the WAMZ.

With respect to human capital, its impact on growth in the region remains positive and significant thus reinforcing the importance of human capital in the growth matrix. A surprising result, however, is the impact of domestic capital formation on growth. Its significant and negative impact on growth in the WAMZ could be an indication of poor domestic capital formation/accumulation in the zone. It could also be a symptom of years of political crisis that have engulfed many member countries in the zone, leading to sustained capital flight. The fallout has been reflected in heavy reliance on foreign aids and capital to grow the region.

Table 4: Impact of FDI, Trade on Economic Growth in WAMZ: IV-Regressions

Variable	Dependent Variable: Log of Real GDP per capita (*Y*)		
	2SLS		
	(1)	(2)	(3)
Const.	-7.339	-7.813	4.450
	(-1.075)	(-1.630)	(1.599)
$Debtserv_{t-1}$	-0.139	-0.159	0.442***
	(-0.439)	(-0.719)	(4.096)
K_{t-1}	-0.645	-1.080***	0.519
	(-1.206)	(4.562)	(0.936)
$Govsize_{t-1}$	0.537	0.933*	-0.128
	(0.791)	(1.788)	(0.742)
$Humcap$	2.429***	2.914***	1.352***
	(3.117)	(3.203)	(2.825)
$IniGDP_{t-1}$	-0.405	-0.879	0.438
	(-0.493)	(-1.631)	(1.379)
L	-0.087	-0.161	-0.467***
	(-0.189)	(-0.449)	(-3.066)
FDI_{t-1}	0.126***	0.222**	
	(8.063)	(4.562)	
$(FDI * Humcap)_{t-1}$		-0.018	
		(-1.631)	
$Trade_{t-1}$			-1.164
			(1.379)
Adj. R-square	0.299	0.291	0.324
Hausman Stat.	15.849	21.439	3.622
	(0.027)	(0.006)	(0.822)
Sargan Stat.	1.759	2.030	16.286
	(0.624)	(0.362)	(0.012)

Notes: *estimation is based on Robust (HAC) standard errors; *, **, and *** denotes significance at 10%, 5% and 1% respectively. Values in bracket for the estimated coefficient are the t-statistics while those for the Hausman and Sargen stats are the P-values.*

4.2.3 FDI, Trade and Growth in WAMZ: Panel Dynamic Ordinary Least Squares (DOLS) Estimation

As a confirmatory analysis and robustness check, we also used the panel dynamic ordinary least square (DOLS) estimation technique to correct for any possible effect of endogeniety problem in our models. The results of the exercise are reported in Table 5.

Table 5: Impact of FDI, Trade on Economic Growth in WAMZ: DOLS-Regressions

Variable	Dependent Variable: Log of Real GDP per capita (*Y*)		
	DOLS		
	(1)	(2)	(3)
Const.	-0.083	0.168	1.462
	(0.884)	(0.769)	(0.387)
$Debtserv_{t-1}$	0.074***	0.080***	0.074***
	(0.000)	(0.000)	(0.002)
ΔK_{t-1}	-2.347e-07	-0.0002	1.74e-04
	(0.988)	(0.900)	(0.913)
$\Delta Govsize_{t-1}$	0.003	0.005	0.004
	(0.554)	(0.304)	(0.331)
$\Delta Humcap_{t-1}$	0.362***	0.364***	0.353***
	(0.000)	(0.000)	(0.004)
$IniGDP_{t-1}$	0.131	0.182	0.459
	(0.531)	(0.463)	(0.195)
ΔL_{t-1}	5.986e-07	3.306e-07	-1.583e-07
	(0.295)	(0.547)	(0.857)
FDI_{t-1}	2.293e-09***	2.188e-09***	
	(0.000)	(0.000)	
$(FDI * Humcap)_{t-1}$		0.020	
		(0.426)	
$Trade_{t-1}$			-0.179***
			(0.000)
Adj. R-square	0.235	0.235	0.043
F-stat	8.230***	6.669***	1.011
	(0.000)	(0.006)	(0.426)
DW	1.336	1.95	1.001
No. of Obs	165	149	165

Notes: *estimation is based on Robust (HAC) standard errors; *, **, and *** denotes significance at 10%, 5% and 1% respectively. Values in bracket for the estimated coefficient are the t-statistics while those for the F-stats are the P-values.*

Generally, the results are relatively consistent with the previous ones; although very few of the variables are significant. The impact of FDI and trade on growth are still significantly positive and negative respectively. However, the effect of FDI on growth is very negligible. While human capital also proves to be a positive and significant growth determinant, the interaction of FDI and human capital remains positive but insignificant. The insignificant of this variable probably suggests that many foreign companies in Africa make most use of foreign expatriate managers, due to shortage of highly skilled labour in the host country (see Bhinda, *et al.,* 1999) and only hire domestic human resources on condition of retraining (see Ayanwale, 2007).

Surprisingly, external debt service continues to bear not only a wrong positive sign, but remains significant in all the estimation. Since we do not have any reasonable theoretical justification for this, we choose to say that the result is ambiguous.

5. Conclusion and Lessons for Policy

This study contributed to the debate about the impact of FDI and trade on growth using current data from the WAMZ nations. From our findings, FDI remains a key catalyst for promoting higher growth in the zone and therefore needs to be encouraged. This is particularly glaring giving the constraints currently posed by limited amount of domestic investment in the zone. Countries in the WAMZ must put in place appropriate incentives and create conducive environment that would encourage higher inflows of FDI. One of such is to provide adequate infrastructure especially power generation. All forms of political instability that have engulfed most countries in the zone should be avoided. The region must be politically stable to encourage foreign investment inflow.

Also, trade in the region has been shown to contribute negatively to growth thereby putting into question the efficacy of trade liberalization policies pursued by member countries in the zone. In our conclusion, we caution that until the present un-favorable trade composition is reversed, countries in WAMZ may not be able to effectively use trade to record any significant growth in their economies. In view of this, countries in the zone

must re-examine their current trade relations and composition; they must vigorously pursue policies that engender domestic production while discouraging higher import volumes. Presently, the region needs to be cautious about trade liberalization policies until they are able to strengthen their domestic productive capacity. Moreover, without some restriction on trade to curb persistent deficits, countries in the zone may further compound their external debt problems which in turn possess serious threat to stability of the proposed monetary union.

In addition, given the findings of this study, human capital development should be a key priority in the WAMZ countries. The need for greater investment in education and training of high quality personnel cannot be overemphasized. Also, governments in the zone must be wary of unguided market liberalization; targeted interventions in terms of government spending in key sectors must be undertaken to promote greater growth.

Finally, it is important to point out a few limitations of this study. First, the coverage of this study is limited to the six member countries in the WAMZ. As such the conclusions drawn may have a limited implication for Africa as a whole. Other studies could expand this scope to incorporate countries in the Sub-Saharan Africa. Secondly, our analysis is very aggregative; it would be useful to re-consider this in further studies by analyzing the specific effect on each member countries in the WAMZ.

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