The External Debt and Its Impact on Economic Growth and Investment in ECOWAS Countries

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Abstract
Debt level has increased in most African countries in recent years; furthermore, in some countries at a worrisome pace. But the continent is not yet experiencing a systemic risk of a debt crisis. On a regional level, several countries in the Economic Community of West African States (ECOWAS) experienced major episodes of a financial crisis that were characterized by unsustainable fiscal deficits after several decades after independence. During this period, however, current account deficits were considered normal. Therefore, ECOWAS countries were encouraged to borrow from abroad to finance their deficits and to create a conducive environment that attracts foreign investment to boost economic growth. Meanwhile, little attention was paid to the individual countries' absorptive capacities and ability to repay the borrowed funds. Suma (2007) posited that external funding has been crucial in developmental projects, financing capital, and budgetary support for developing countries. This research will build upon the framework of Suma (2007) but covering the ECOWAS countries from 1970-2017 via spatial regression panel regression methods. The general objective of this research is to examine the impact of external debt on economic growth in ECOWAS countries. To achieve this general objective, the specific objectives of this research are

- Investigating the link between external debt and economic growth of ECOWAS countries;
- Examining the structure, type, and composition of ECOWAS' external debt;
- Identifying the transmission mechanism of external debt influences on economic growth of the ECOWAS countries

Key Words: ECOWAS, External Debt, Economic Growth in ECOWAS, Spatial Panel regression

1. Introduction

Do countries with high external debt accumulation grow faster or slower? Such a question is no Quite easy to answer. Adepoju et al. (2007) noted that developing countries in Africa are characterized by inadequate internal capital formation as attributed to the vicious circle of low productivity, low income, and low savings. Therefore, the latter forces less developed countries (LDC) including the countries in the Economic Community of West African States (ECOWAS) to look for the necessary support from Western countries to provide the necessary resources to end the vicious cycle as described earlier. Such external borrowing has the motif to promote economic growth, not just financing its debt. If a debt is utilized well, then not only the economy comes out of crises but it also grows. The lack of basic infrastructure and capital in LDCs requires them to acquire these resources to improve economic growth, and these resources can be purchased on credit taken from the developed nations. However, there are contrarian views about external debt because external debt acts as a major restraint to capital formation and stymies economic growth LDC by crowding out private investment because as debt accumulates, the servicing requirements and the principal repayment increases. Consequently, this external debt becomes a self-actualizing mechanism of increasing poverty that hinders economic growth (Ayadi et al, 2008).

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The debt level has increased in most African countries in recent years; furthermore, in some countries at a worrisome pace. But the continent is not yet experiencing a systemic risk of a debt crisis. On a regional level, several countries in ECOWAS experienced major episodes of the financial crisis that were characterized by unsustainable fiscal deficits after several decades after independence. During this period, however, current account deficits were considered normal. Therefore, ECOWAS countries were encouraged to borrow from abroad to finance their deficits and to create a conducive environment that attracts foreign investment to boost economic growth. Meanwhile, little attention was paid to the individual countries' absorptive capacities and ability to repay the borrowed funds. The objective of this research is what are the impacts of external debt service on growth and investment in ECOWAS countries? More specifically, this paper examines the

- high external debt-service harms growth in ECOWAS countries
- high external debt-service crowds out public investment in ECOWAS countries

2. Existing Literature

2.1 Theoretical Literature

Issuing public debt is considered an important mechanism to finance public spending and to stimulate aggregate demand. A theme of the standard Keynesian models considers public debt as necessary to ensure that aggregate demand is high and to keep the economy towards full-employment (Sardoni, 2013). According to Modigliani (1961), Diamond (1965), Saint-Paul (1992), and Aizenman et al. (2007), there are two reasons for the negative relationship between external debt and economic growth: (i) existence of crowding-out effects on private investment because of higher real interest rate across the financial market; (ii) public debt is considered an intergenerational burden because it implies a smaller stock of capital for future generations.

There are theoretical discussions considering the external and domestic debt separately. In the case of developing countries, with non-developed capital markets and high currency volatility, this separation is important because the effect of both kinds of debt on the economy is different. For instance, Emmanuel (2012) states that a high level of external debt will reduce the availability of funds for private investment because the government has to pay its external debt. Mehl and Reynaud (2010) consider domestic debt has short-maturity and exposes a government to a high probability of default. On the other hand, Reinhart and Rogoff (2010) show that the accumulation of a large domestic debt is often at the roots of external debt crises and large inflationary episodes.

Recent studies have argued that in the context of increasing fiscal imbalances, moderate levels of government debt can induce economic growth (Afonso and Jalles, 2016). Mbate (2013) using the Laffer curve theory, concludes that there exists a non-linear relationship between public debt and economic growth. More specifically, an initial level of domestic debt accelerates economic growth through resources for financing budget deficits. However, with a continuous increase in the debt stock, the economy experiences a debt overhang and lower economic growth.

2.1.1 Empirical Literature

Several researchers have shown that there exists a negative relationship between external debt and economic growth (Calderón et al., 2013, Swamy, 2015). Now Afonso and Alves (2015) examine the effects of government debt on real per capita GDP growth for 14 European countries from 1970 to 2012. Their study shows that (i) government debt harms

economic growth, in the short and long-term, (ii) debt service has a much more negative effect on economic performance than debt, and (iii) there is an inverted U-shape relationship between the debt ratio and economic growth.

Schclarek (2004) investigates the relationship between public debt and per capita GDP growth in 24 advanced countries and 59 developing countries using panel data for 1970-2002. In advanced countries, the empirical results do not find any robust evidence suggesting that higher public debt levels are not associated with lower GDP growth rates. On the other hand, for developing countries, the empirical results show a negative and significant relationship between public debt and economic growth.

Pattillo et al. (2002) use a large panel dataset of 93 countries over 1969-1998 that focused on developing countries and narrowly on external public debt. They found a non-linear impact of government debt on economic growth. They also found a negative impact of external debt on per-capita GDP growth for the net present value of debt levels above 35-40% of GDP. Clements et al. (2003) explore the relationship between government debt and growth for a panel data of 55 low-income countries from 1970 through 1999. Their empirical results show a negative effect of external public debt on growth after the value of this debt reaches about 20-25% of GDP.

Reinhart and Rogoff (2010) investigate the relationship between government debt and economic growth using 20 advanced countries and emerging countries from 1970 to 2009. Their empirical results show that advanced countries showed no clear relationship between debt and economic growth until the debt reaches a threshold of 90%. As for developing countries, it was found that an external debt level over 60% and further external debt levels exceeding 90% reduce economic growth quite substantially. More important, inflation becomes significantly higher only for countries with external debt over 90%. Therefore, they conclude that the relevance of debt threshold analysis on economic growth and that public debt may not be so bad.

3. Theoretical Framework

This section delves into the theoretical framework of budget deficits, especially in the context of how it resulted in external indebtedness in ECOWAS countries in recent years. As Buiter (1983) pointed out, there are several ways to measure the size of budget deficits. The simplest and most useful, perhaps, is the public sector borrowing requirement or the excess of expenditure over revenue for all levels of government. Other measures of budget deficits include the correction for the inflation component of interest payments commonly referred to as 'operational deficit' and the other that exclude all interest payments, also known as the 'primary deficit'. The nature of budget deficits determines the number of resources the government may need to fill the existing gap in the budget. An important issue to consider is the benefits and costs of a balanced budget, which raises the question: why is it desirable to achieve a budget in which government expenditure equals tax revenue?

The initial effect of a budget deficit is to lower national savings, which consists of both private and public saving. The specific way in which deficits lower savings can be best understood by examining the national income and product accounts. Private saving is the difference between disposable income and consumption, which can be linearly represented as:

$$S = Y + Tr + Int - Tx - c \tag{1}$$

where S is private saving, Y is the gross national product, Tr and Int are government transfer and interest payments respectively, and Tx is tax revenue and C is consumption.

Substituting for Y based upon the income-expenditure identity,

$$S = I + (G + Tr + Int - Tx) + Nx \tag{2}$$

where G is government spending, I is an investment, and Nx is net exports. This fundamental relationship points out that a deficit $(G+Tr+Int > Tx)$, with private saving, held constant, lowers national saving $(S - G - Tr - Int + Tx)$ and thereby adversely affects investment or net exports or both. The mechanism through which a decline in national saving reduces investment and or net exports is the interest rate. When the government finances a deficit by borrowing from the financial markets, the interest rate rises, thereby reducing investment spending and causing an appreciation in the domestic currency. The appreciation retards exports and stimulates imports.

The preceding analysis depends on the assumption that private saving does not respond to government deficits. Barro (1974), however, argues that private saving will not remain unchanged but instead will increase in response to the sale of government bonds to finance the deficits. This argument is based upon the so-called Ricardian Equivalence theorem, which holds that the private sector fully anticipates higher future taxes to repay the borrowing undertaken to finance the deficit. To pay for the expected future increase in taxes the private sector will therefore increase saving accordingly. Bond-financed deficits in this case will have no adverse effect on investment or net exports because the budget deficit will be matched unit to unit by additional private saving, leaving the interest rate unchanged.

The view that deficits will not affect economic activity is disputed by both Keynesians and fiscal conservatives, who argue that it is based upon questionable assumptions (Bernheim, 1987). Regardless of the merit of the assumptions, substantial empirical evidence such as Evans (1987, 1988, 1993), fail to support the Ricardian Equivalence theorem. Ball and Mankiw (1995) explained that investment, net exports, and private saving all declined over the period 1982 to 1994, despite the existence of large and persistent deficits in the US. Since deficits appear to adversely affect both investment and net exports, it is important to trace out more fully their possible long-run consequences. In particular, the crowding out of investment translates into a smaller capital stock than otherwise. This implies a reduction in an economy's productive capacity and hence long-run growth (Barth, Russek, and Wang, 1986).

A decline in net exports, on the other hand, means that more claims on domestic assets will flow overseas than otherwise to finance those imports that are no longer financed by export earnings. As foreigners receive a greater share of the earnings on domestic assets, national income declines. Since large and persistent budget deficits must eventually be offset by budget surpluses to prevent unbounded growth in debt, future taxes must increase, and spending must decrease to respond to such deficits. Tax increases reduce disposable income as well as create economic inefficiencies through additional compliance and avoidance costs. Spending cuts also impose burdens on the public if transfer payments are reduced or government services are curtailed.

4. Data Sources and Methodology

4.1 Data Sources

This empirical analysis uses a spatial panel regression model for the ECOWAS countries over the period 1970–2017, annually. The data are from the World Development Indicators (WDI) from the World Bank. Table 1 summarizes the variables used in this analysis and the description of each of these variables and its expected sign in the analysis.

The income per capita is expected to have a negative coefficient because of the convergence effect. The terms of trade growth reflect external shocks to the ECOWAS country

Table 1: Description of the Variables

Variable	Description
Per Capita Income	The average income measures the average income earned per person in a given nation in a specified year. It is calculated by dividing the area's total income by its total population.
Debt Service to Imports	This is the sum of principal repayments and interest actually paid in currency, goods, or services on the long-term debt, interest paid on shortterm debt, and repayments (repurchases and charges) to the International Monetary Fund.
Total Debt Stocks	Debt owed to nonresidents repayable in currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less.
Terms of Trade	The ratio between the index of export prices and the index of import prices.
Gross Private Domestic Investment	The measure of physical investment used in computing GDP in the measurement in a nations' economic activity.
Foreign Aid (not loans)	Measures the inflow of economic assistance as grants, not loans to the nation.

and are expected to have a positive coefficient. Then, for the coefficient of gross domestic investment, this is expected to be positive, because it reflects the positive impact of physical capital on growth. Finally, for foreign aid (not loans), this reflects the inflow of external assistance, and it should be a positive coefficient.

4.2 Methodology: Spatial Analysis

Spatial models incorporate both space and time data sets. Spatial linear regression models for cross-sectional data account for specifications where observations are available for a cross-section of spatial units at a point in time. On the other hand, space-time regression models are taking into account patterns of cross-sectional dependence and heterogeneity among regional entities (Kelejian and Piras, 2017; Anselin, 1998). Equation (1) shows the space-time dependencies and forms of heterogeneity:

$$Y_{it} = \beta_1 X_{it} + \epsilon_{it} \tag{3}$$

where X_{it} is a row vector of observations for spatial unit i at time t, β_{it} is the vector of space-time specific parameters, and ϵ_{it} is a vector of error terms. The error term in a spatial regression is characterized by the following conditions:

$$E[\epsilon_{it}] \tag{4}$$

$$E[\epsilon_{it}\epsilon_{js}] \tag{5}$$

while equation (4) is a standard condition of the error term in OLS, equation (5) shows the conditions of the error term for the space-time dependencies and the spatial heterogeneity. As pointed out by Kelejian and Piras (2017) and Anselin, (1998), this variation can be across space indexed by i, over time indexed by t, or over space and time indexed by it or $E[\epsilon_{it}\epsilon_{it}] = \sigma$ which shows the constant variance; $E[\epsilon_{it}\epsilon_{it}] = \sigma_i$ spatial heterogeneity;

$E[\epsilon_{it}\epsilon_{it}] = \sigma_t$ shows timewise heterogeneity; $(E[\epsilon_{it}\epsilon_{it}] = \sigma_{it}$ space-time specific variance. In these conditions, with $i \neq j$ $t = s$ the dependence is a contemporaneous spatial correlation, which can either be specific to each time t or can be the same for all the periods. This can be shown that $E[\epsilon_{it}\epsilon_{jt}] = \sigma_{ij}$ which shows the contemporaneous correlation.

4.3 Spatial Panel Regression

Spatial panel data models capture spatial interactions across spatial units and over time (Elhorst, Piras, and Arbia, 2010; Lee and Yu, 2010a, Lee and Yu 2010c; Lee and Yu, 2010d, Lee and Yu, 2010b). Equation (6) shows the general static panel model that includes a spatial lag of the dependent variable and spatial autoregressive disturbances:

$$Y = \lambda(I_t \otimes W_n)y + \beta X + \epsilon \tag{6}$$

where y is an N_{T*1} vector of observations on the dependent variable, X is a N_{T*k} matrix of observations on the non-stochastic exogenous regressors, I_T an identity matrix of dimension T, W_N is the $N * N$ spatial weights matrix of known constants whose diagonal elements are set to zero, ϵ is the disturbance term and λ the corresponding spatial parameter. Equation (6) shows the disturbance vector as the sum of two terms which is given as

$$\epsilon = (\zeta_t \otimes I_n)\mu + u \tag{7}$$

where ζ_t is a $T * 1$ vector of ones, I_n is a $N * N$ identity matrix, μ is a vector of time-invariant individual-specific effects that are not spatially autocorrelated, and u is a vector of spatially autocorrelated innovations that follow a spatial autoregressive process which is given as

$$u = \rho\big(I_T \otimes W_N\big)\epsilon + v \tag{8}$$

with ρ as the spatial autoregressive parameter, W_N) is the spatial weights matrix, $(v_{it} \sim IID\ (0, \sigma_v^2)$ and the error term is given as $u = (I_T \otimes B_N^{-1})v$ where $B_N = (I_N - \rho_{WN}$. Then, from the latter the error term for the spatial panel regression becomes

$$\epsilon = \big(\zeta_t \otimes I_N\big)\mu + \big(I_T \otimes B_N^{-1}\big)v \tag{9}$$

and the variance-covariance matrix for equation (9) becomes

$$\omega_\epsilon = \sigma_\mu^2(\zeta_t\zeta_{tT} \otimes I_N) + \sigma_v^2// \quad \Big[(I_T \otimes B_{NT}B_N)^{-1}\Big] \tag{10}$$

From this specification of the spatial panel regression, the maximum likelihood estimation will be used, and we also determine the fixed and random effects used. These results will be presented in the discussion of the empirical results. For the analytical details for these inferential tests, the reader is referred to the references cited earlier in this section.

5. Empirical Results from the Spatial Panel Regression

We present the results of the estimated spatial panel regression models for the ECOWAS countries across space and time from 1970–2017. Table 2 summarizes these results

Notes: Dependent Variable is the annual growth rate (%); p-values are in parentheses. LIK is the value of the log-likelihood function. AIC is the value of the Akaike information criterion and SC is the Schwarz information criterion.

The estimated regression yields significant spatial lag coefficients with the expected sign. The R-square listed is called a so-called pseudo-R-square, which are not directly comparable with the measure and interpretation as in the OLS estimation. From the output,

Table 2: Preliminary Results from the Spatial Panel Regression

Growth Model	Growth
R. Squared	0.793
LIK	-29.728
AIC	73.456
SC	76.850
Moran's I	-0.237
Lag Coefficient ρ	-1.066 (0.000)
Constant	-23.602 (0.081)
Log Per Capita Income	4.195 (0.029)
Log Debt Service to Exports	-3.259 (0.002)
Log Total Debt Stocks	1.580 (0.038)
Log Terms of Trade	0.727 (0.708)
Log Gross Private Domestic Investment:	2.211 (0.204)
Log Foreign Aid (FAID)	2.662 (0.162)
Variance, σ^2 (error)	0.7915998 (0.0000)
Diagnostics for Heteroskedasticity (Random coefficients)	
Breusch-Pagan Test	2.887 (0.717)
Diagnostics for Spatial Dependence (Spatial Lag Dependence for Weight Matrix)	
Likelihood Ratio Test	9.406 (0.002)
Mean of fixed-effects $= -0.0137$	

the measures of fit are the Log-Likelihood (LIK), Akaike Information Criterion (AIC), and Schwarz Criterion (SC) are given. The smaller the values of these measures, the better the regression fit. As indicated in the Log-Likelihood and Akaike Criterion, the models display similar fits across time with some periods exhibiting better regression fits than the others. The spatially adjusted Breusch-Pagan Tests are not significant, and this indicates the absence of heteroskedasticity problems across time.

From the results of the growth equation, the initial per capita income variable, which is included to capture the speed of convergence among countries in ECOWAS. The coefficient of this variable should be negative under the conditional convergence framework, since due to diminishing returns to inputs, the higher the initial values of per capita income the lower the growth rate. However, the variable does not display the expected negative sign and is statistically significant.

The external debt ratios (debt-service to exports of goods and services and total debt stock to GDP), which are the key variables that capture the impact of external debt on

economic growth in ECOWAS countries It showed a negative sign meaning that external debt-service is negatively correlated with economic growth in ECOWAS countries. This finding directly implies that the debt overhang hypothesis is only empirically supported. Empirical support for the debt overhang hypothesis is achieved if the coefficient of the debt-service ratio has a negative sign with statistical significance.

The terms of trade variables are intended to capture the external shocks to these economies since ECOWAS countries depend mainly on the export of primary products and are expected to have either positive or negative coefficients depending on the international market forces. A positive coefficient will indicate that favorable terms of trade contribute positively to growth, while a negative coefficient would affect growth otherwise. The estimated results show a positive coefficient for the terms of trade which indicates that trade contributes positively to the economic growth of ECOWAS. If the sign was negative, this would mean that ECOWAS economies are highly vulnerable to external shocks since they rely mainly on the export of primary agricultural products as their foreign exchange earner. But keep in mind that the external shocks that are reflected in the terms of trade depend on the international market forces. When these forces are in their favor, the prices of their export commodities rise relative to other commodities in the world market and vice versa.

The coefficient of the gross domestic investment variable should be positive since a higher domestic investment is expected to contribute positively to economic growth in ECOWAS. From the empirical results, the sign is positive which means that the gross private domestic investments contribute positively to the economic growth in the ECOWAS countries. If the coefficient was negative, not all investments in ECOWAS likely yielded a rate of return higher than the cost of investment due to poor investment decisions, mismanagement of investment funds, and internal political and macroeconomic stabilities.

The foreign aid variable is included in the model to capture the effects of foreign resource inflow in the form of grants, not loans, into the ECOWAS countries. The coefficient should be positive since the higher the inflow of resources, the more it contributes positively to economic growth in the region, having significant effects on economic growth in ECOWAS countries. A limited number of regression diagnostics are provided in the maximum likelihood estimations. The Breusch-Pagan Tests for heteroscedasticity in the error terms are insignificant, suggesting that heteroscedasticity is not a problem in this specification.

Finally, as for the autoregressive term (ρ), a positive coefficient would indicate the presence of a positive spatial dependence on economic growth among ECOWAS countries whereas a negative coefficient would show a negative spatial relationship. In this model, it showed a negative coefficient. Consequently, the economic growth in one country of ECOWAS may impact negative growth in neighboring countries because of the strong competition among them for resources as well as in the export of goods and services. If one country becomes more competitive in obtaining natural and financial resources than the others, it grows faster while the neighbors would experience slower economic growth.

6. Summary and Conclusions

This paper analyzed empirically the external debt problem in the ECOWAS countries via a spatial panel regression that incorporates the influence of spatial interaction and spillover effects to investigate the impact of external debt on economic growth in the ECOWAS countries from 1970 through 2017. This spatial panel regression used the annual GDP growth rate as the dependent variable, while the regressors consisted of per capita income, terms of trade, gross private domestic investment, external debt, and foreign aid inflows, not loans.

Since the independence of many of these ECOWAS countries, they have heavily on foreign capital, mostly in the form of foreign loans to supplement their low domestic savings and to boost economic growth and investment. The scarcity of domestic financial resources for development is a problem in many developing countries, not just ECOWAS. This problem is known as "the financing gap problem." Under the latter, it predicts that by injecting foreign capital even in the form of external loans into the domestic economy would generate economic growth. However, this prediction is not supported by the current external debt problem in the region.

Prior studies have used the traditional econometric methods that avoided any spatial component. This analysis used a spatial panel regression model to determine the effects of spatial interaction and spatial dependence among ECOWAS countries from 1970 through 2017 which would include some years of crisis in the ECOWAS countries. There is a spatial element because each of these ECOWAS countries would interact with each other. After all, the economic growth in one country may impact the growth trajectory of other ECOWAS countries. This paper laid out the foundation of the economic growth model, but future work would consider the addition of an investment model.

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