Growth effect of government expenditures in West African countries: A nonlinear framework

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Abstract
The study investigated the impact of government size on economic growth and determined the optimal government size that will promote growth in ECOWAS Countries. This was with a view to determining the relationship between government size and economic growth in ECOWAS countries. The study employed annual secondary data. Data covering the period 1980 to 2015 on total government spending, gross domestic product, imports and exports of goods and services, domestic investment, inflation rate, total population and institutional quality were collected from World Development Indicators. Data were analysed using Panel Fixed Effect analytical technique. The study found that government size had positive and significant ($t = 3.59$, $p < 0.05$) impact on economic growth when government size is below the optimal size whereas the impact was negative and significant ($t = -3.08$, $p < 0.05$) when government size is above the optimal size. Furthermore, the optimal government size is 25.31% of total GDP on the average for ECOWAS countries and this level has not been reached by any of the ECOWAS member countries. The study concluded that the relationship between government size and economic growth depends on optimal government size in ECOWAS countries.

INTRODUCTION

The rapid increase in the size of the public sector has been one of the most salient economic features of 20th century. Government size more than tripled during the century in a representative sample of industrialized countries. The most rapid increase has corresponded to the heading "transfers and subsidies", indicative of the re-distributive action of government, whose share in GDP has increased from about 1 per cent towards the end of 19th century to about 21 per cent one century later (Tanzi and Schuknecht, 2000). As a consequence, the public sector has increasingly become a re-distributor of wealth created by the private sector of the economy.

The issue of relationship between government size and economic growth is currently of burning importance to most economies across the world, especially in the United States and European Union because most countries have been confronted with an increasing public debt and a drop in their economic growth since 2007. Faced with the crisis, governments, like the American Congress, chose to support economic activity with reflationary policies *i.e.* public spending, thus increasing public deficit and public debt. This choice seems to have been justified by the Keynesian paradigm, based on a virtuous cycle of public spending through the multiplier effect.

This observation appears to hold across most countries regardless of the level of development. For the last 20 years, expansion in the share of government as a percentage of GDP appears to have been the norm in both developing and developed countries. But in comparing developing and developed nations, the current levels, growth rates, composition, and determinants of government expenditures exhibit significant differences.

In 2014, government size in developing countries ranged from 12 percent to 84.4 percent and exhibited greater variance than was found in the industrial countries. In the same period, total government expenditure shares out of GDP ranges from 31.9 percent to 58.0

percent for OECD countries while United State of America and United Kingdom reported government size of 38 percent and 43.8 percent respectively (OECD, 2015). It was observed that developing economies, especially the low-income countries, devoted on average smaller percentages of GDP to government spending than do OECD countries. But when compared with the historical experience of the industrial nations, developing countries already consume much higher fractions of GDP.

In West African countries, like any other developing economies, the government is usually regarded as the largest spender of money and this trend has continued to rise on the average due to the increased demand for public goods such as roads, communication, power, defense, education, health and other infrastructure that complement private sector productive activities. Available statistics show that total government expenditure and its components have continued to rise in the last two decades based on the premise that the countries in Africa have a weak infrastructural base, hence government has to play a greater role in stimulating and engendering economic growth in the face of market imperfections.

REVIEW OF RELEVANT LITERATURE

Findings from the empirical literature on government size and economic growth relationship are mixed. Some studies are of opinion that government size has positive effect on economic growth (Komain and Brahmasrene, 2007; Alexiou, 2009). Other studies posit that the effect of government size on economic growth is negative (Bajo-Rubio, 2000; Folster and Henrekson, 2001; Illarionov and Pivarova, 2002; Vu Le and Suruga, 2005; Taban, 2010).

The debate on sign of the relationship between government size and growth is still on. Attempt to resolve these conflicting views have led to the consideration of non-linear relationship between the government size and economic growth. Ample evidence also indicate linear or monotonic relationship between government size and growth in ECOWAS countries; some studies reported a negative relationship (Ansari, Gordon and Akuamoach, 1997; Enang, 2010) and others recorded a positive government size-growth nexus (Yasin, 2003; Muse, Olorunleke and Alimi, 2013; Oriakhi and Arodoye, 2013). Given that empirical literature supply conflicting views on the impact of government size on economic growth, it become plausible to consider the possibility of a non-linear relationship for ECOWAS countries.

It is also noted that empirical evidence on the threshold of government size are from developed countries, with only a few reported for developing African economies. Most of the existing studies for Africa were country-specific. In these studies, they are either investigating the impact of government expenditure (aggregated or/and disaggregated) on economic growth (Kabeya, 2009) or testing the validity of Wagner and Keynes hypothesis (M'Amanja and Morrissey, 2005; Ogbonna, 2012; Akinlo, 2013).

Moreso, there are apparent sparse studies on the optimal government size in relation to growth in ECOWAS countries. Among the available studies are the work of Pollard, Shackman and Piffaut (2011) who considered Africa as a subset panel in their study, Ekeocha and Oduh (2012) and Olaleye, Edun, Bello and Taiwo (2014) conducted their studies on Nigeria and, Heerden and Schoeman (2008) who estimated the optimal size of government for South Africa. It is found that both studies of Pollard, Shackman and Piffaut (2011) and Olaleye, *et al* (2014) did not determine optimal size of government for Africa and Nigeria respectively. In case of Ekeocha and Oduh (2012), the data employed in the study was not up to date – it ended in 2006, which makes inference from the study obsolete. Heerden and Schoeman (2008) based their study on strong assumptions of balanced budget and assume away the other drivers of economic growth. As pointed out in studies on growth (Sala-i-Martin, 1997) control variables are significant in growth regression; however, in the studies of Heerden and Schoeman (2008) and Olaleye, *et al* (2014) which adopted bivariate relationship, they did not avail their studies of robust information in the growth equation as suggested by Sala-i-Martin (1997).

Upon the foregoing, this study identifies the following gaps on the government size that optimized growth in ECOWAS countries, a sub-region of Africa. Firstly, the non-linear relationship between government size and economic growth, which has not been consider in existing studies for ECOWAS countries necessitate a re-examination of the impact of government size on economic growth. Secondly, differing from extant studies, this study will employ an up to date data and incorporate control variables that are suggested in growth literature, in order to determine optimal government size in ECOWAS countries.

METHODS

In order to test the relationship between government size and economic growth that is theoretically characterized by the inverted U curve, this study uses a simple quadratic equation following Vedder and Gallaway (1998), Pevcin (2004) and Davies (2009);

$$grw_{it} = \beta_1 + \beta_2 gov_{it} + \beta_3 gov^2_{it} + v_{it} \qquad (1)$$

where grw_{it}, defined as the difference between lngdppc$_{it}$ and lag one of lngdppc$_{it}$, is growth in per capita GDP in country i at time t. i = 1,…,15 is the individual country and t = 1,…,36 is the period under study; gdppc is the Gross Domestic Product per capita, *ln* is the natural logarithm operator. *gov* is general government expenditures as a share of GDP.

The positive coefficient of the linear *gov* term is related to the constructive effects of government spending on output, and the expected negative coefficient of the squared *gov* term (gov^2) is related to the negative effects of increased government size. β_2 and β_3 are coefficients of government size and the square of government size over time while v_{it} is the error term or the white noise. This regression equation specified in equation (1) is a second-degree polynomial function, because it includes both the linear term and the squared term of *gov* in the estimation equation. Since the second-degree polynomial function is linear in the parameters, i.e., β_2 and β_3, it does not present any special estimation problems and can be estimated using the pool ordinary least squares estimation technique.

The model in equation (1) was expanded to accommodate some traditional variables of the literature on the growth – expenditure relationship as control variables as suggested Dalamagas (2000) and Asselain and Blancheton (2005). These explanatory variables include the investment share of GDP (*inv*), population growth rate (*pop*), inflation rate (*inf*) and the openness of the economy (*open*). Also, recent studies in growth literature involves investigating the role of institutions on economic growth and successive literature review by Armey (1995), Abdiweli (2003) and Asoni (2008) have confirmed the consensus that institutions matter for growth. Hence, the study accommodates this position and adds institutional quality (*ins*) as explanatory variable.

Taking into account these variables, equation (1) becomes

$$grw_{it} = \phi_1 + \phi_2 gov_{it} + \phi_3 gov^2_{it} + \phi_4 inv_{it} + \phi_5 inf_{it} + \phi_6 open_{it} + \phi_7 pop_{it} + \phi_8 ins_{it} + \varepsilon_{it} \qquad (2)$$

The signs of the coefficients are expected to be: $\phi_2 > 0$; $\phi_3 < 0$; $\phi_4 > 0$; $\phi_5 < 0$; $\phi_6 > 0$; $\phi_7 < 0$; $\phi_8 > 0$. This is based on stylized facts about these parameters (Mankiw *et al*, 1992; Anaman, 2004; Weil, 2009).

The properties of the estimated parameters of the quadratic equation will provide evidence to prove the existence of the Armey curve. Since the squared term (gov^2) increases in value faster than the linear term (*gov*), it follows that the presence of negative effects from government spending will eventually outweighs the positive effect, producing a downward-sloping portion.

Measurements of Variables and Sources of Data

The growth rate of GDP per capita (current USD) was used as a measure of economic growth while government size was measured as the total government expenditure as a share of total GDP. The dataset consists of a panel of 12 countries out of 15 member countries of Economic Community of West African States (ECOWAS); Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo. Benin, Cape Verde and Liberia are dropped from sample countries due to missing data and incomplete data for some of the variables of interest.

As widely used in the growth literature (Levine, Loayza and Beck, 2000; Hung, 2011) averaging data over fixed intervals has the potential for eliminating business cycle fluctuations. Thus, allowing the focus to be on the medium – and long – term trend in the data. Therefore, all values of variables are five-year averages in order to eliminate short – term fluctuations.

Data for all variables, total government expenditure (*gov*), gross domestic product per capital (*gdppc*), population growth rate (*pop*), trade openness (*open*), inflation rate (*inf*), gross capital formation (*inv*) and institutional quality (*ins*), is sourced from World Development indicator (WDI) database and it covers the period 1980-2015.

Panel Data Estimations

Applying pooled OLS regression to equation (2), countries' unobservable individual effects are not controlled; therefore according to Bevan and Danbolt (2004), heterogeneity of the countries under consideration for analysis can influence measurements of the estimated parameters. Hence, this study uses a panel data model with incorporation of individual effects which has a number of benefits for example, among others; it allows us to account for individual heterogeneity. Indeed, Serrasqueiro and Nunes (2008) shows that developing countries differ in terms of their colonial history, their political regimes, their ideologies and religious affiliations, their geographical locations and climatic conditions, not to mention a wide range of other country specific variables. And if this heterogeneity is not taken into account it will inevitably bias the results, no matter how large the sample is.

Therefore, by incorporating countries' unobservable individual effects in equation (2), the model estimated is as follows:

$$grw_{it} = \phi_1 + \phi_2 gov_{it} + \phi_3 gov^2_{it} + \phi_4 inv_{it} + \phi_5 inf_{it} + \phi_6 open_{it} + \phi_7 pop_{it} + \phi_8 ins_{it} + \delta_{it} \quad (3)$$

where, $\delta_{it} = \mu_i + \varepsilon_{it}$ and μ_i is countries' unobservable individual effects. The difference between a pooled OLS regression and a model considering unobservable individual effects lies precisely in μ_i. When we consider the random effect model the equation (3) will be same, however in that case μ_i is presumed to be having the property of zero mean, independent of individual observation error term ε_{it}, has constant variances σ^2_ε, and independent of the explanatory variables. The utilization of the fixed effects model is consider more consistent because it does not entail the assumption of no correlation between the country specific effects (Baltagi, 2005; Stock & Watson, 2010). However, the Hausman's test is utilized in order to decide whether fixed or random effects models are appropriate for estimation purpose.

In order to determine the threshold value of government size that optimised growth, the study will apply partial differentiation. Taking the first partial derivative of growth of GDP per capita (grw_{it}) with respect to government size (*gov)*, using equation 18, produces

$$\frac{\partial grw}{\partial gov} = \phi_2 - 2(\phi_3 gov) \quad (4)$$

$$\phi_2 - 2(\phi_3 gov) = 0 \quad (5)$$

$$\hat{gov}_t = \frac{\phi 2}{2(\phi 3)} \quad (6)$$

The procedure that equalizes the values of the first partial differentiation to zero produces the optimal government size ($\hat{gov}$). Assuming the first order condition is met, the study took the second-order derivative test in order to ascertain that equation (6) will produce a relative maximum or minimum;

$$\partial^2 grw/\partial gov^2 = -2\phi_3 \quad (7)$$

Since equation (22) is negative i.e $\partial^2 grw/\partial gov^2 < 0$, therefore government size relative maximum.

RESULTS

The panel unit root tests are applied based on three different panel unit-root tests; Levin, Lin & Chu (2002), Im, Pesaran and Shin (2003) and Maddala – Wu (1999) tests. The various tests as reported in Table 1 show that the *gov*, gov^2, *inf and ins* series are stationary at levels at least at 5% significance level. The panel unit root tests, except IPS also suggest that *inv* and *pop* series are stationary.

Table 1, shows that the series *grw and open* which are non-stationary at levels but achieved stationarity after taking the first difference at 1% significance level under IPS test and 5% significance level under PP-F. Since all the panel unit root test assume the null hypothesis of each individual series is non-stationary, results obtained reveals that the null hypothesis cannot be rejected for all the series at levels but is strongly rejected (at 5% significance level) at their first difference. Hence, we conclude that these variables are integrated of order one I(1), it therefore necessary to determine whether there is at least one linear combination of the variables that is l(0).

Table 1: Panel Unit Root Test Results

Variables	Levin, Lin & Chu	Im, Pesaran & Shin	PP-Fisher Chi-square (PP-F)
grw	3.5625	3.1210	5.8560
Δ*grw*	-5.7628***	-0.4789	38.0183**
Gov	-21.8985***	-5.8819***	95.7627***
gov^2	-42.6962***	-9.9656***	100.679***
Inv	-4.3742***	-0.3897	51.4431***
Δ*inv*	-	-0.3363	-
Inf	-15.5977***	-5.7188***	86.2452***
Open	-2.0873**	0.1763	34.2224*
Δ*open*	-7.6108***	-0.8721	35.6086*
Pop	-5.1263***	-0.5181	46.0659***
Δ*pop*	-	-0.7209	-
Ins	-11.7827***	-5.8001***	131.513***

*** (1%), ** (5%) & *(10%) level of significance

Hence, the study tested for cointegration among the variables that are integrated of order one only as suggested by Hualde (2006). Table 2 shows the results of the Pedroni (1999, 2004) panel cointegration tests, as outlined in the methodology section. The test statistic of Panel PP, Panel ADF, Group PP and Group ADF reject the null hypothesis of no cointegration at 5% significance level while the null hypothesis cannot be rejected under Panel v-Statistic and Panel rho- Statistic, even at 10% level of significant. Thus, the Pedroni test statistics submit that the variables are cointegrated.

Panel Cointegration Results

Table 2: Pedroni Panel Cointegration Test Result

Test	Weighted Statistic	Prob.
Panel v-Statistic	-1.715873	0.9569
Panel rho- Statistic	-2.534350	0.9944
Panel PP-Statistic	-2.804240	0.0025***
Panel ADF-Statistic	-1.952592	0.0254**
Group rho- Statistic	4.071258	1.000
Group PP-Statistic	-6.743837	0.0000***
Group ADF-Statistic	-3.736039	0.0001**

Note: *** (1%), ** (5%) & *(10%) level of significance

EMPIRICAL FINDINGS AND DISCUSSIONS

Panel Fixed Effects Estimation with AR(1)

In this section, the study employed panel fixed effects estimation with AR(1) to take into account the problem of autocorrelation and presence of heteroskedasticity. The choice of fixed effect model over random effect model was based on the result of Hausman Test. First, using all the explanatory variables in the model (Model 1), the result found that all the estimated parameters are statistically significant at 5% level of significance except for inflation and population variables as reported in **Table 4**. We then left out the explanatory variables of the model step by step, eliminating the least significant variable, until all the included variables are significant at the 10% level or better.

Table 3: Result of Hausman Test

Test Summary		Chi-Sq. Statistic		Prob.
Cross-section random		9.917809		0.0776
Variables	**Fixed effect Coefficient**	**Random effect Coefficient**	**Var (Diff)**	**Prob.**
Gov	0.083181	0.055272	0.000426	0.1763
Gov^2	-0.002051	-0.001454	0.000000	0.1821
Inv	0.008957	0.003862	0.000008	0.0633
Open	-0.002500	0.001836	0.000005	0.0637
Ins	-0.004468	-0.000270	0.000003	0.0124

This procedure led to the reduced models, Model 2 and parsimonious Model 3. In the model 2, dropping *pop* variable improves a little both the coefficients and P-values of the other variables, although *inf* variable is still not significant. The parsimonious model 3, when *inf* variable is dropped, is preferred to model 2 because there is improvement in the P-values of the parameter estimates of model 3 over model 2. All the estimated coefficients have expected signs except for trade openness.

Table 4: Panel Fixed Effects Results

	Model 1		Model 2		Parsimonious Model 3	
Variables	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Constant	4.0210	0.1248	4.0456	0.1134	3.7913	0.1745
Gov	0.0794***	0.0015	0.0795***	0.0013	0.0836***	0.0007
Gov^2	-0.0016***	0.0044	-0.0016***	0.0039	-0.0016***	0.0032
Inv	0.2510***	0.0003	0.0251***	0.0003	0.0246***	0.0003
Inf	-0.0027	0.2343	-0.0027	0.2276	-	
Open	-0.0124***	0.0000	-0.0124***	0.0000	-0.0128***	0.0000
Pop	0.0043	0.9101	-		-	
Ins	-0.0049**	0.0197	-0.0049**	0.0177	-0.0050**	0.0151
R-Squared Durbin-Watson Stat. Prob(F-stat.)	0.850059 1.878777 0.0000		0.850022 1.877690 0.0000		0.845719 1.877078 0.0000	-

Note: ***, **, * denote significance at the 1%, 5% and 10% level

Therefore, the estimated form of regression equation derived from equation (3) is given as

$$grw_{it} = 3.7913 + 0.0836gov_{it} - 0.0016gov^2_{it} + 0.0246inv_{it} - 0.0128open_{it} - 0.0050ins_{it} \quad (8)$$

This result is consistent with the suggested hypothesis – higher government size is detrimental to economic growth after a certain point and that is why the coefficient of the square term of government size is negative.

Focusing first on the total effect of government size on growth, the coefficients reported in Table 4 advocate that government expenditures have a positive impact on economic activity in ECOWAS countries. In fact, a 10% increase in government size entails on average about 0.82% point increase in per capita GDP growth (calculation based on the coefficients of *gov* and gov^2 in Table 4). However if we look into the marginal effect of government activity, the conclusion is more contrasted. Consequences of change of government size on economic growth in ECOWAS countries can be demonstrated from the estimated regression by expressing growth as a function of government size. So, in order to derive the marginal impact of government size on growth when it changes by one unit, we differentiate growth with respect to government size as in equation (19) to produce;

$$\frac{\partial grw}{\partial gov} = 0.083685 - 0.003306gov \quad (9)$$

Equation (9) posits that a given change in government size has different effects on economic growth depending on the value of government size. This contrast with linear model, for which any specific change in government size always changes growth by a precisely predictable amount no matter what government size, is. For instance, the marginal effect of increasing government size by one unit point on economic growth in a linear model specification is 0.01457 (see Table 5 for result panel fixed effect model using linear specification). Thus, the marginal impact of government size on economic growth in a non – monotonic relationship diminishes as government size gets larger that is the ability of government spending to increase growth reduces. This submission is in line with the findings of Munene (2015) and Moreno-Dodson and Bayraktar (2015) whose inferences indicate that there are diminishing returns to scale for government size.

Table 5: Panel fixed effect - Linear Model Specification

Variables	Coefficient	p-value
Constant	3.718018	0.4352
Gov	0.01457	0.0469
Inv	0.022909	0.0001
Inf	-0.003125	0.2429
Open	-0.010660	0.0006
Pop	0.013833	0.3832
Ins	-0.002659	0.1904
R-Squared Durbin-Watson Stat. Prob(F-stat.)	0.824124 1.49889 0.0000	

Optimal Government Size in ECOWAS Countries

In this section, the study attempt to answer the third research question of this study. The properties of the estimated parameters of the quadratic equation provide evidence to prove the existence of the Armey curve. In order to establish this inverted U-shaped curve, the coefficient of the linear term of government share of GDP (*gov*) needs to be positive and the coefficient of the square term of government share of GDP (gov^2) needs to be negative. Following our earlier discuss of BARS curve, since the squared term increases in value faster than the linear term, it follows that the presence of negative effects from government spending will eventually outweigh the positive effect, producing a downward-sloping portion. The results obtained from the panel estimation techniques thus support the statistical estimation of the BARS curve and they provide a framework to approximately compute the specific point where output is maximised. Using the estimates from the panel estimation techniques given by equations (9), Table 6 presents the estimated of optimal government size s percentage of GDP. This result of panel fixed effect estimation technique suggests that the curve peaks where government spending is approximately equal to 25.31% of GDP.

Table 6: Estimated Optimal Government Size (% of GDP)

Estimation Techniques	Coefficient of gov	Coefficient of gov^2	Optimal Government Size (% of GDP)
Panel Fixed Effects	0.083685	-0.001653	25.31

The study assessed empirically the validity of Armey curve by determining the non-linear impact of government size on economic growth when it is above and below the optimum level. The study found strong evidence of the existence of an inverted "U-shaped" relationship between government size and economic growth. In particular, when the government size of the average country in ECOWAS is below the optimal size, a 10%

increase in government size, will enhance economic growth by 0.84%. However, if the average country is above the optimal size, then a 10% increase in government size will decrease growth by 0.017%. Therefore, the impact of government size on growth is larger quantitatively when it is below the estimated threshold. This position is consistent with finding in Romero de Avila and Strauch (2008), Chen, Chen and Kim (2011) and Asimakopoulos and Karavias (2015).

The study finds that the optimal level of government size is in the range of 25.3%. This falls within the range reported in the related literature. For example, Afonso, Schuknecht and Tanzi (2003), in sample of 23 OECD countries, finds that the optimal level of government spending is equal to 35%, whereas Chobanov and Mladenova (2009), in a sample of 28 OECD, reports a threshold of 25%. In different studies on European Union, Pevicin (2004) finds optimal government size of 36-42% for a sample of 12 countries while Forte & Magazzino, (2010) in sample of 27 countries, finds that the optimal size of government is between 35.39% and 43.5%. In studies of eight ASEAN countries, Hok, Jariyapan, Buddhawongsa and Tansuchat (2014). Optimal size of government spending: Empirical evidence from eight countries in Southeast Asia. *The Empirical Econometrics and Quantitative Economics Letters, 3*(4), 31 - 44. (2014) obtained optimal size of government 28.5 percent.

For low income countries (i.e. those with per-capita RGDP's below the median), Davis (2009) finds the optimal size of government to be 30% while Ekeocha and Oduh (2012) and Olaleye *et al* (2014) found 23% and 11% for Nigeria respectively, Heerden and Schoeman (2008) found 21.94% for South Africa, Keho (2010) for Cote d'Ivoire found 21.1 to 22.3% of GDP and Munene (2015) found 23 per cent optimum government size for Kenya

The optimum of government spending was different from a research to another due to methods, observations, or/and the situation of covered countries in their studies. The optimal government size in most studies, either by economic group or country specific, ranges from 17.5% to 45% of GDP (Chobanov and Mladenova, 2009; Facchini and Melki, 2011). This range is contained in threshold proposed by Professor Friedman when he asserts that "*Government has an essential role to play in a free and open society. Its average contribution is positive; but I believe that the marginal contribution of going from 15% of the national income to 50% has been negative"* (as cited in Schaefer, 2006, p 7).

In attempt to situate the individual sample country into the optimal government size obtained for ECOWAS group, the study depicts in Table 1 the mean government size for three periods (20-year, 10-year and 5-year). The study shows that government size in the three periods for all sample countries has been lower than the optimal size. Burkina Faso recorded government size of between 19.07% and 21.64% in the three periods while Gambia in the first period (1980-1999) had government size of 20.63%; these are the closest to the determined optimal government size during the study period.

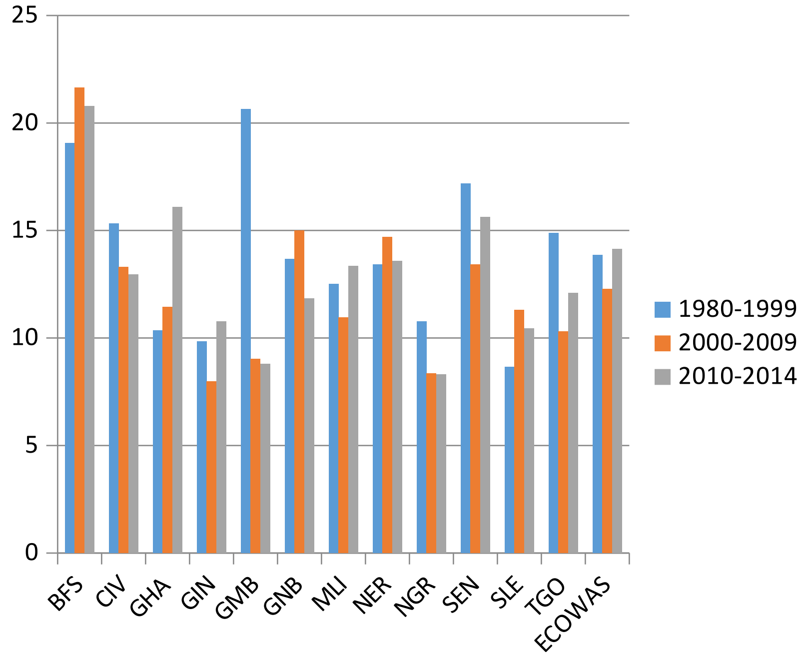

Figure 1: Mean Government Size, percentage of GDP

The result of the study surmises that ECOWAS economic group is still on the upward sloping portion of the Armey curve. Therefore, increasing government size towards the optimal size is desirable. However, the policy of increasing the share of public expenditures in ECOWAS countries should be implemented with caution and selectiveness. Even though the government size in these countries has been lower than the optimum level, increasing government size might not boost economic growth unless there is improved efficiency in public sectors such as education and health, improving the quality of institutions to curb rent-seeking activities and corruption as noted by (Wu, Tang and Lin, 2010). According to the statistics issued by International Country Risk Guide (2014), the institutional quality in most of the sample countries under study is lower than that in developed countries in term of high corruption, low respect for law and order, poor democratic accountability and bureaucratic quality. Therefore, improving efficiency and performance in public sectors is a pre-condition to boosting economic growth through government spending (Grigoli and Mills, 2014).

Effects of Control Variables in Growth - Government Size Relationship

The high level of corruption, the risk of breach of contract and risk of government expropriation, have clear negative effects on growth, according to Abdiweli (2003). The study found that corruption index is statistically significant at 5 per cent level and it's inversely related to growth. The negative sign reported suggests that increase in corruption perception level will impact the growth per capita of ECOWAS countries negatively. This result is consistent with Tachiwou (2014) who found that corruption hampered economic growth in West African Economic and Monetary Union (UEMOA) countries.

As Acemoglu and Verdier (2000) point out, corruption is a by-product of government interventions. It is especially made possible by the discretion that the policy makers enjoy in determining the type, size, and composition of projects and service delivery. This view that corruption is detrimental to growth is well supported by previous studies such as (Gyimah-Brempong 2002; Ndikumana, 2007). The result of investment variable is reported to be highly significant and has positive sign under this specification. This finding does not deviate from the results obtained by Ghazali (2010), Fantessi (2015) and Ilegbinosa, Micheal & Watson (2015). Trade openness that is theorized as pro-growth has a negative sign and it's highly significant, thus suggesting that trade openness is a drag on economic growth in ECOWAS countries. One plausible reason for this negative effect on growth rate might be as a result of high dependency ratio on imports compare to countries with a mature manufacturing sector. This observation is in line with submission of Dufrénot, Mignon and Tsangarides (2009) in a panel study that involves Cote d'Ivoire, Mali, Niger and Senegal.

CONCLUSION REMARKS

The empirical contribution of this study was to provide evidence of the existence of an inverted U-shaped relationship between government size and economic growth using panel data of ECOWAS countries over a period 1980 to 2015. Many studies have shown that there is a negative relationship between government size and economic growth after a certain point of government participation in the economy is reached. The government has as its core functions the protection of lives and properties, establishing the rule of law, the sanctity of contract, and perhaps the creation of a limited set of public goods. Nevertheless, growing above these functions, the government is likely to be detrimental to economic growth.

There are two main findings. First, beyond linear link between government size and economic growth, the study found a strong evidence of non-monotonic relationship, once quadratic model was applied. Second the optimal government size of the ECOWAS countries would be between 25.30% as a share of total GDP and this has not been reached by any member countries of ECOWAS in the last one decade. Based on these results, the study can conclude that average country in the sample is still on the upward sloping portion of their inverted U-shaped curve. Hence, increasing government size is desirable.

Recommendations

Based on our study, the following propositions could be made: that the impact of government size on economic growth in ECOWAS countries has inverted U-shaped pattern and the optimal level of government size at which economic growth can be maximized is in range of 25.30%. Since the government size of sample countries has been lower than the optimal size, the study suggests that the countries in ECOWAS can increase economic growth by increasing government spending as a share of GDP, especially through increasing public investment expenditures in building infrastructures, healthcare, education, improvement of labor force, and Research & Development. This policy of increasing the share of public expenditures in ECOWAS countries should be implemented with caution and selectiveness because of efficiency issue. Therefore improving efficiency and performance in public sectors should be a pre-condition to boosting economic growth through government spending.

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