Revisiting the Government Spending and Growth analysis in Ghana: A disaggregated Analysis

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Revisiting the Government Spending and Growth analysis in Ghana: A disaggregated Analysis 1970-2010

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ABSTRACT

Government's desire to raise economic growth in Ghana has led to a sharp rise in government spending in Ghana without any significant impact on economic growth. This study set out to investigate the relationship between economic growth and government spending at the disaggregated level with the ARDL model with annual data spanning from 1970 to 2010 to advice policy makers on the dynamics of growth. The study found out that, in both the long run and short run, government capital expenditure has a significant negative impact on economic growth but recurrent expenditure has a positive effect on economic growth in both the long run and the short run though it was not significant in the short run. The study therefore advocates for fiscal discipline and efficiency in the disbursement of capital expenditure to trigger positive benefits in the future.

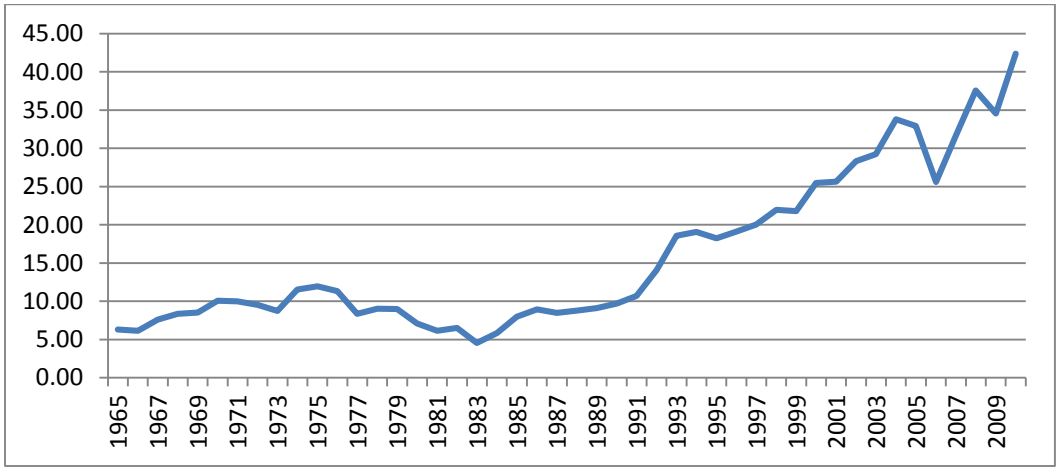
Key words*; economic growth, government expenditure, Capital expenditure, recurrent expenditure*

Introduction

Ghana experienced fluctuating trends in economic growth since it gained independence. A look at the World Bank's World development indicators (2011) and data from the Ministry of Finance revealed that, while government expenditure is increasing at an increasing rate, the level of economic growth has stagnated until 2011 where the government recorded economic growth rate of about 14.5% owing primarily to the production of oil in commercial quantities. Available data suggest that while some years have recorded positive growth others recorded negative growth rates. A time series plot of the growth rate of Ghana suggests that it has been stationary since 1965.

Real government expenditure on the other hand has been trending upwards. If average economic growth rate is anything to go by, since 1965, Ghana has been growing annually at a rate of 4.5% compared to the annual average growth in real expenditure of 8.5%. From the year 1995 to 2010 the economy has grown at an average rate of 5.8 instead of the average of 8% as desired in the vision 2020 in the same years real government expenditure grew at 13% clearly we could see that the disparity is wide. The story is not different at the disaggregated level as depicted in figure 1 and 2.

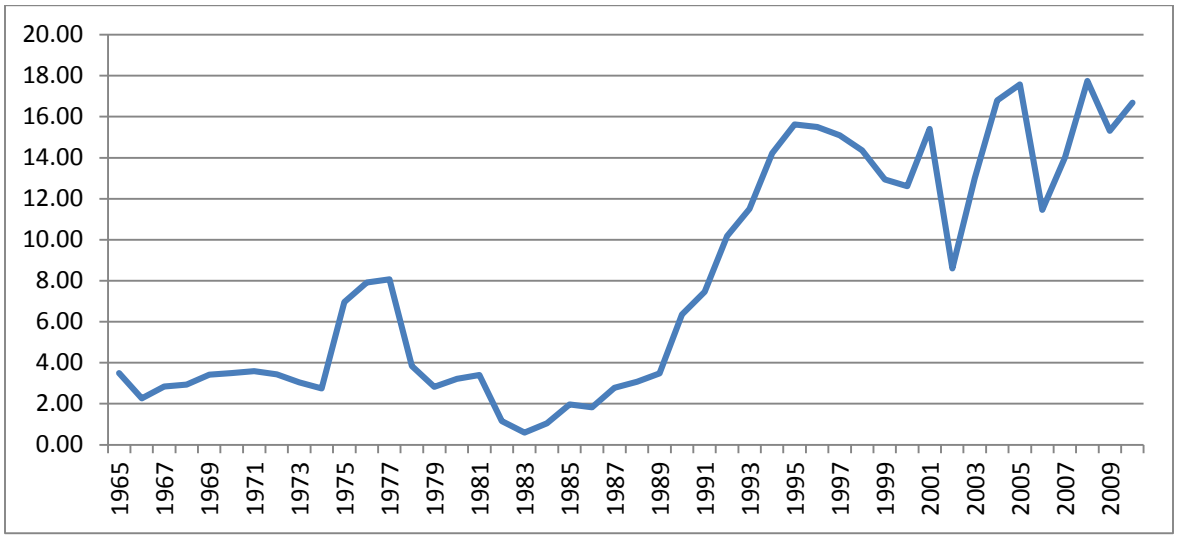
Figure 1: Recurrent Expenditure Trends in Ghana



Source: Author's construct: MOFEP data

The graph evidently demonstrates the continuous upsurge of the recurrent component of the government of Ghana expenditure since 1983. The bulk of this expenditure stream is attributed to the large public sector wages and salaries (emoluments). The introduction of the single spine salary structure even gives the curve a higher slope as could be seen the trend took a higher dimension starting from the year 2009.

Figure 2: Capital Expenditure Trends in Ghana



Source: Author's construct: MOFEP data

This expenditure component of government expenditure started realizing a sluggish upward trend in the latter part of the 1960's and begun an upsurge in the early part of the 1970's but wasn't sustainable. The lowest ever government expenditure towards capital goods was experienced in 1983. This was the period where Ghana was experiencing economic problems as such general government expenditure was low. The periods after 1983 have recorded great increases in government expenditure but not without short periodic declines as could be seen from figure 2.5. The year 2008 recorded the highest government of Ghana capital expenditure. This was made possible by the benefits the economy was gaining from the HIPC funds it received. Considering the contribution of capital expenditure to development and that of recurrent expenditure, it would have been promising for development if the former was larger than the latter.

Available data suggests that recurrent expenditure has always been higher than capital expenditure in Ghana except for 1977 when they were numerically the same. It could also be seen that, these

two expenditure types have been increasing over the years while economic growth has stagnated between 4% and 8%.

One major issue that has featured prominently in our development plans is the desire to develop our private sector. Indeed the private sector has been taunted as 'the engine of growth' in Ghana. But with the spiral rise in government expenditure a lot of economists have become sceptical about the prospect of the sector. As indicated in Nketia-Amponsah (2009) the proponents of a smaller government size advance the argument that, larger government impedes economic growth because many government operations are inefficient and does not address the true public interests. The Keynesian tradition however believes in the use of government expenditure to empower and facilitate private sector performance. In this regard, several questions abound for example; what is the nature of the relation between economic growth and public expenditure in Ghana? Does the Wagnerian hypothesis (Wagner's assertion that the public purse automatically expands as the economy grows) holds in Ghana at the disaggregated level? The study will therefore undertake a journey by employing the neoclassical growth model to unravel the nature of the variables that affects economic growth with disaggregated government expenditure featuring as one of the determinants of economic growth.

Government Expenditure Trends in Ghana

According to Meng (2004), government expenditure in Ghana has always been difficult to control. Before Ghana attained independence from her colonial masters, a ceiling was put on government expenditure at 10% of the GDP. This cap was removed by Dr. Nkrumah when he assumed office in 1957.This was bound to happen considering the infrastructure gap the nation was facing and ambitious industrialization objective that he had. The high expenditure was supported by the issuing of treasury bills. By 1965 domestic bank credit to government was 12.5% of GDP and total

bank lending rose from 14.5 million pounds sterling on monthly average to 153 million pounds sterling with commercial debt reaching 110 million pounds. (Meng, 2004) The increase in expenditure spearheaded a rise in inflation which eventually caused some supply rigidities in 1981.

Through the introduction of the Economic Recovery Programme (ERP) by the Provisional National Defence Council (PNDC) government, it was decided that government expenditure should be reduced to relieve the banks of unnecessary pressures. Initially the programme made some progress in the economy but foreign debts kept rising for instance the debt to GDP ratio increased from less than 5% in 1982 to more than 80% by 1992. In 1988, the government initiated the externally-funded $85 million Program of Action to Mitigate the Social Costs of Adjustment (PAMSCAD) that created 40,000 jobs over a two year period this did not lower the dependence of the west African nation on foreign aid and external borrowing By 2000, foreign debt totalled at 160% of the GDP according to Leith (2003).

In view of the foregoing, in 2002 the New Patriotic Party (NPP) government decided to opt for the international Monetary Fund's (IMF) Highly Indebted Poor Country (HIPC) initiative. The initiative led to significant debt relief service to Ghana but after the programme run to an end, external borrowing continue to be the source of government expenditure which in itself have assumed an upward trend in recent times. All these have led to stunted economic growth in Ghana. For the past 20 years economic growth has stabilized at around 4.5 until 2011 where the oil sector brought significant increase in growth. A pictorial view of the relationship between government expenditure and economic growth is given below.

Literature Review

A number of studies have been conducted to assess the nature of relationship that exists between economic growth and government. Landau (1983) in his study; "Government expenditure and economic growth: A Cross-Country Study", utilized regression analysis to find out the general determinants of growth in 96 countries. The result of his study indicated a negative relationship between the share of government consumption expenditure in GDP and the rate of growth of per capital GDP. The result according to Landau is consistent with a pro free market view that, within the market economies a growth of government hurts economic growth (crowding out effect). However, his result is not a solid foundation for strong conclusions due to the fact that, the government share variable is only government consumption expenditure, but not total government expenditure or total government economic impact. Barro (1989) conducted a cross country analysis to examine the determinants of growth. His framework utilized the neoclassical growth approach and a panel data from around 100 countries. Variables such as government policies, government consumption, inflation, democracy, life expectancy and education were assessed on growth rate of real per capita GDP. His study indicated that smaller government consumption raises the level of growth compared to a higher expenditure. Anaman (2006) employed the neoclassical economic growth model to express economic growth as a function of government size, government size squared, the annual growth rate of the real value of total exports, the annual growth rate of total labour force, the annual growth rate of total human-made capital and political stability. The study pointed out that, Government size impacted on economic growth in quadratic manner "with increasing government size resulting in increasing growth until a point is reached beyond which growth would actually fall with increasing government size". Tridico (2007) conducted a cross-country analysis to find the determinants of economic growth among emerging

economies using OLS and correlation matrix. To him human capital and export capacity are very fundamental to economic growth. On the importance of government expenditure, the study indicated that, pluralism and state intervention in non-income sectors such as health public expenditure and education generates more opportunities for people. On the disaggregated front, Nurudeen and Usman (2008) also utilized disaggregated data to find the relationship between government expenditure and economic growth in Nigeria. They expressed economic growth (GRY) as a function of many constituents of government expenditure that include total capital expenditure, total recurrent expenditure , expenditures on defence , agriculture, transport and communication , education and health with inflation and government fiscal balance added. They revealed that, all expenditure levels were significant including inflation and overall fiscal balance. Expenditures on defence and agriculture were not significant in explaining economic growth according to the study. This is particularly a surprise given that; many West African economies are seen to be agrarian. Their study also revealed a negative relationship between both capital and recurrent expenditure and economic growth possibly due to rise in corruption in the West African country and that any increase in inflation and overall fiscal balance results to a decrease in economic growth. Patrick (2009) adopted the Johansen's approach to cointegration to estimate the macroeconomic determinants of economic growth. The study recognized that, Government expenditure yielded a negative relationship with real GDP per capita over the study years for Ghana. This, according to Patrick (2009) implies that government expenditure was not directed into pro-growth and pro-poor activities in the economy. Twumasi (2010) also concluded that taxes and government spending had significant long-run impacts on economic growth in Ghana he suggested that, "the level of government spending and taxes in an economy can be effective in managing economic growth both in the short run and the long run". It is also evident that the set of

non-fiscal variables in the study also had significant impact on economic growth in Ghana. Sakyi and Adams (2012) analysed the effect of democracy, openness and government spending on economic growth in Ghana for the period 1960–2008 with the help of an Auto Regressive Distributed Lag (ARDL) model. They found out that democracy and government spending do not have positive long run and short-run impact on economic growth but theory was fulfilled when democracy and government expenditure were interacted. The literature above does not give us a clear cut relationship between economic growth and the various component of government expenditure. In this regard the study will decompose government expenditure into current and capital expenditure and add new independent variables not tested at the disaggregated level in Ghana before to bring out new findings.

Method of Study

The study adopts the aggregate production function as the theoretical basis upon which the model for analysis will be based. The aggregate production function is stated as,

$$Y_t = A_t\ K_t^{\alpha} L_t^{\beta} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1.1)$$

where Y_t is real GDP, L and K are labour and capital respectively and A_t is the total factor productivity, it is a vector of other independent variable that theoretically and empirically have effects on the independent variables. We therefore augment it to include the following independent variables; Following Feder (1982), Ram (1986), and Grossman (1988) as stated in Alexiou (2009), Nketia-Amponsah (2009), Sakyi(2011), Ahortor et al. (2013), Bloom and Canning (2000 and 2001) Sakyi and Adams (2012), the study models the productivity of Ghana as;

$$RGDP = f(K, L, GCAP, GCUR, OPENNESS, INF, LE) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1.2)$$

Where L and K are capital and labour as indicated above, GCAP and GCUR represents government capital expenditure and Recurrent expenditure, OPENNESS represents the country's openness to trade it is measured by the use of the trade intensity index. It is calculated as Export + Import divided by GDP. INF is the inflation rate and LE is the Life Expectancy of Ghana representing the general Health status of Ghanaians. The theoretical basis for including government expenditure is founded in the Keynesian multiplier process. Whereby, a rise in government expenditure transmits into series of processes that create jobs and subsequently increases the income levels in the economy. For investigative purposes, the government expenditure is divided into capital and recurrent expenditures (GCAP and GCUR). This indeed, is not far from theory as government spending is primarily towards these two expenditure components. Capital expenditure measures the value of purchases of fixed assets that is, those assets that are used repeatedly in the production processes for more than a year. They include the construction of roads and building of hospitals etc. The OECD on the other hand, defines current expenditures as expenditures on goods and services consumed within the current year, which needs to be made recurrently to sustain the production of services. Minor expenditure on items of equipment, below a certain cost threshold, is categorized as recurrent expenditure.

The study expects the life expectancy of Ghanaians to be positively related to economic growth in Ghana and all the variables are in real terms with the notable exception of LE which is in years and the study maintains all the original variables in the aggregate production function as logs and treat all the new independent variables added through the expansion of the total factor productivity variable A_t as level variables arriving at a log linear model that assumes the form of equation 1.5. All data are from the World Bank development indicators with only the expenditure variables from MOFEP Ghana and Openness was calculated as Export + Import divided by GDP using UN data.

Unit root test of the variables are conducted with the help of the Augmented Dickey Fuller test to prevent spurious regression results and to tackle auto correlation in the test procedure. The model is analysed within the ARDL framework due to the need to take stock of the long run and short run implications of the analysis. Moreover, ARDL cointegration procedure is efficient in small samples and makes it possible to estimate cointegration through ordinary least squares. Another advantage that must be mentioned: "The

ARDL approach has the additional advantage of yielding consistent estimates of the long-run coefficients that are asymptotically normal irrespective of whether the underlying regressors are I(1) or I(0)" Pesaran (1997). Other estimation procedures cannot boast of the same technical advantage in multivariate estimation. The final ARDL model that is used to test for cointegration is given as

$$\Delta lnRGDP_t = \beta + \theta_1 lnRGDPt_{-1} + \theta_2 lnK_{t-1} + \theta_3 lnL_{t-1} + \theta_4 GCAPt_{-1} + \theta_5 GCURt_{-1} + \theta_6 OPENNESS_{t-1} + \theta_7 INF_{t-1} + \theta_8 LE_{t-1} + \sum_{i=1}^{p} \lambda_{1i} lnRGDP_{t-i} + \sum_{j=1}^{q1} \lambda_{2j} \Delta lnK_{t-j} + \sum_{k=1}^{q2} \lambda_{3k} \Delta lnL_{t-k} + \sum_{d=1}^{q3} \lambda_{4d} \Delta GCAP_{t-d} + \sum_{b=1}^{q4} \lambda_{5b} \Delta GCUR_{t-b} + \sum_{f=1}^{q5} \lambda_{6f} \Delta OPENNESS_{t-f} + \sum_{o=1}^{q6} \lambda_{7o} \Delta INF_{t-o} + + \sum_{r=1}^{q7} \lambda_{8w} \Delta LE_{t-r} + U_t \quad \ldots\ldots (1.6)$$

The various lags of the variables are expected to be determined based on the Hannan Quinn Information Criterion because it has the advantage of being objective and automatic.

The second step is to test for the long run relationship between the variables. This section forms a conditional ARDL model of order (p, q_1, q_2, q_3, q_4, q_5, q_6, q_7) to test the long run relationship between all the variables of interest. The ARDL model will assume the form,

$$lnRGDP_t = \beta_0 + \sum_{i=1}^{p} \theta_{1i} lnRGDP_{t-i} + \sum_{j=1}^{q1} \theta_{2j} lnK_{t-j} + \sum_{k=1}^{q2} \theta_{3k} lnL_{t-k} + \sum_{d=1}^{q3} \theta_{4d} GCAP_{t-d} + \sum_{p=1}^{q4} \theta_{5p} GCUR_{t-p} \sum_{a=1}^{q5} \theta_{5a} OPENNESS_{t-a} + \sum_{e=1}^{q6} \theta_{6e} INF_{t-e} + \sum_{w=1}^{q7} \theta_{7w} LE_{t-w} + \varepsilon t \quad \text{.....(1.7)}$$

The lag length of the variables is selected based on the Hannan Quinn Information. The short run dynamics is captured by the error correction model,

$$\Delta lnRGDP_t = \beta_0 + \sum_{i=1}^{p} \lambda_{1i} \Delta lnRGDP_{t-i} + \sum_{j=1}^{q1} \lambda_{2j} \Delta lnK_{t-j} + \sum_{k=1}^{q2} \lambda_{3k} \Delta lnL_{t-k} + \sum_{d=1}^{q3} \lambda_{4d} \Delta lnGCAP_{t-d} + \sum_{y=1}^{q4} \lambda_{5y} \Delta GCUR_{t-y} + \sum_{g=1}^{q5} \lambda_{6g} \Delta OPENNESS_{t-g} + \sum_{h=1}^{q6} \lambda_{7h} \Delta lnINF_{t-h} + \sum_{n=1}^{q7} \lambda_{8n} \Delta LE_{t-n} + \rho ECM_{t-1} + \varepsilon_t \quad \text{..... (1.8)}$$

Where, λ_i is the short-run dynamics coefficients of the model's dynamic adjustment to equilibrium. ECM_{t-1} term is the Error Correction factor. Thus it represents the short run disequilibrium adjustment of the estimate of the long-run equilibrium error term. ρ measures the speed of adjustment to obtain equilibrium in the event of shocks .

Results and discussions

Unit Root test were performed solely with the Augmented dickey Fuller test by considering the levels of the variables first with an intercept and with both intercept and trend and then the test was extended to include the first difference of the variables that were not stationary as could be seen in table 1.1below.

Table 1.1: ADF Unit Root Test

VARIABLES	LEVELS		FIRST DIFFERENCE	
	INTERCEPT	**INTERCEPT+ TREND**	**INTERCEPT**	**INTERCEPT +TREND**

lnRGDP	7.999	2.317	-1.086	-5.292***
lnK	2.736	-1.163	-6.815***	-5.672***
lnL	-6.285***	-6.656***		
OPENNESS	-1.513	1.796	-6.570***	-7.060***
GCAP	-1.981	-2.002	-5.766**	-5.705**
GCUR	-1.932	-2.327	-6.336**	-6.043**
INF	-2.510	-4.792***		
POL	-1.441	-3.077	-5.773***	-4.6444***
LE	-0.396	-2.563	-3.158**	-3.035

Calculated and generated from Eviews 7.0 and **&* denotes the rejection of the null hypothesis of unit root at the 5% and 10% significant level respectively.**

The unit root test showed that no variable was integrated of order two *I(2)* as such, the ARDL model could be applied without any problems.

Cointegration test

Cointegration is achieved when either the 'F' or the 'W'-Statistic lies above the upper boundary of the respective significant level chosen (in this case the 5% level). It is worthy of note that the "F" test is premised on the null hypothesis of no cointegration among the variables. The test conducted tests for cointegration relationship in one equation as indicated above in the methodology section. The various statistics are reported in table 1.2 below.

Table1. 1: Cointegration tests

F' Statistic	**95% Lower Bound**	**95% Upper Bound**	**Cointegration Status**
7.8334**	2.7486,	4.1285	Cointegrated
W-Statistic 62.6668	21.9888	33.0280	Cointegrated
Calculated and generated from Microfit 5.0 ** Denotes the rejection of the null hypothesis at the 5% significant level			

Source; Author's construct

The Bounds test as displayed on the table conclude on the existence of cointegration relationship at the 5% significant level between economic growth and all the independent variables employed.

Table 1.3 shows the ARDL results for the effect of disaggregated government expenditure inter alia on real GDP in the long run.

Table 1.3: Estimated Long Run relationship

Dependent variable is *lnRGDP* ARDL (1,2,0,0,2,1,1,0) selected based on Hannan-Quinn criterion Criterion 39 observations used for estimation from 1972 to 2010				
Regressors	Coefficient	Standard Error	T-Ratio	Probability value
lnK	0.053***	0.012	4.353	0.000
lnL	0.138***	0.024	5.775	0.000
GCAP	-0.006***	0.002	-2.494	0.020
GCUR	0.030***	0.004	7.598	0.000
OPENNESS	0.079	0.072	1.103	0.281
INF	-0.002***	0.000	-6.848	0.000
LE	0.052***	0.005	11.411	0.000
CONSTANT	16.544***	0.153	108.170	0.000

Calculated and generated from Microfit 5.0 *, **, *** denotes the rejection of the null hypothesis at the 10%, 5%, 1% significant level respectively.R^2, RSS and F statistic are presented together with the short run results.

Focusing on the elasticity variables in the model, theory was validated when capital was significantly positively related to economic growth in the long run with an explanatory power of 0.053 which suggests that a 1% increase in the capital stock increases economic growth by 0.053% in the long run. Theory was once again fulfilled as Labour also had its explanatory power being positive and significant at 1%. Thus a 1% increase in the labour force will raise economic growth in Ghana by 0.138%. This clearly was expected as the Ghanaian economy is characterised by labour intensive method of production typical of African countries.

An interesting observation in the production function is the sign of both the capital and recurrent expenditure in Ghana. The relationship shows that in the long run government capital expenditure is negatively related to economic growth. This also is not in line with theory and the prior expectation. The results show that a 1% increase in government capital expenditure will in the long run reduce economic growth by 0.6%. Though the result defies theory, it is possible because

of the potential existence of corruption[1] in Africa[2]. Thus not all the funds devoted to capital expenditure actually end up being used for that activity. This assertion has been proven by Gyimah-Brempong (2002); using panel data on a number of African countries with Ghana inclusive asserted that, corruption indeed decreases economic growth directly and indirectly by decreasing investment in physical capital. A unit increase in corruption reduces economic growth and per capita income by between 0.75 and 0.9 percentage points and between 0.39 and 0.41 percentage points per year respectively. The corruption problem again is highlighted by Fox et al (2011). The researchers hammered on the lack of political and administrative accountability in the Ghanaian situation. They stressed on the fact that politics in Ghana is a zero sum game where the winner takes all in the form of awarding contracts to its loyal supporters at the expense of promoting efficiency in the system. This is probably part of the reason why capital expenditure fails to contribute positively to real GDP growth in Ghana in the present study. Shoddy works by government contractors does not allow most projects to exhaust the expected life span it has been designated for thereby impeding any long run benefit it should have conferred on the economy. Also the sign of capital expenditure could be explained by the potential existence of misallocation of capital expenditure from economically efficient but politically inefficient areas to economically inefficient but politically efficient areas.

Switching to recurrent expenditure, the result showed that recurrent expenditure in Ghana's case is positively related to the level of economic growth and significant at the 1% significant level.

[1] Corruption by public servants and the purported 10% stake given to corrupt politicians' siphons chunk of the money away from their productive uses.
[2] Corruption is not peculiar to only Ghana but the whole of Africa for instance; Modebe et al (2012) also found capital expenditure to be negatively related to economic growth in Nigeria.

According to the result a 1% rise in recurrent expenditure has the propensity of increasing economic growth by 3%. The study expected the long run relationship between recurrent expenditure and economic growth to be negative since this expenditure type does not go into active investment. This finding is not completely out of touch in the world of economic research for instance Ilegbinosa et al (2012) found out that recurrent expenditure in Nigeria confers significant benefit to three sectors of the Nigerian economy.

Openness of the economy to trade is insignificant and though positively related to economic growth, which confirms the persistent deficit in the balance of payment account. Also, the sign of the openness variable could be because the country mainly export primary product which does not enjoy good terms of trade. Inflation was in line with the prior expectation. According to standard economic theory a rise in the level of inflation raises the cost of borrowing which in turn affects private investment thereby negatively impacting on real GDP growth. The inflation situation could be seen to have affected the private investment which as discussed was negatively related to economic growth. From the regression result, a 1% rise in the level of inflation will impede real GDP growth by 0.2%. Life expectancy had a high positive and statistically significant impact on real GDP growth. Its coefficient is re-emphasises the importance of human capital in the production process and how serious the health status of the populace is important in the economy. From the table it could be seen that a 1% year increase in life expectancy in Ghana will raise GDP growth by 5.1% this is quite high and fairly reasonable given that the productivity of labour is enhanced when they are healthy.

4.4 Results and Analysis of Short Run Relationships

The existence of cointegration relationships among the variables implies the estimation of Error Correction Model to capture the short run dynamics of the system and its coefficient measures the speed of adjustment to obtain equilibrium in the event of shocks to the system. Table 4 reports the results of the short-run dynamic growth equation.

Table 4: Short Run Error Correction Representation

Dependent variable is *lnRGDP* 39 observations used for estimation from 1972 to 2010 ARDL (1,1,2,2,0,2,0,1) selected based on Hannan-Quinn criterion				
Regressors	Coefficient	Standard Error	T-Ratio	Probability value
ΔlnK	0.038***	0.009	3.974	0.001
ΔlnL	0.043***	0.007	5.990	0.000
ΔGCAP	-0.004**	0.002	2.338	0.028
ΔGCUR	0.003	0.003	1.127	0.271
ΔOPENNESS	-0.042	0.042	-0.993	0.330
ΔINF	-0.001***	0.000	-4.670	0.000
ΔLE	0.036***	0.006	6.608	0.000
ecm(-1)	-0.709***	0.086	-8.170	0.000
R-Squared	0.860	R-Bar-Squared		0.778
S.E. of Regression	0.021	F-Stat. F(11,27)	14.745	[0.000]
Mean of Dependent Variable	0 .030	S.D. of Dependent Variable		0 .045
Residual Sum of Squares	0 .011	Equation Log-likelihood		104.227
DW-statistic	1.853	Schwarz Bayesian Criterion		76.750
Calculated and generated from Microfit 5.0 and *, **, *** denotes rejection of the null hypothesis at the10%, 5% and 1% significant level				

The short run dynamics of the model was estimated with an R-squared value of about 86% meaning about 86% of the variation in economic growth is explained by the independent variables in the model. The R-bar-square is about 77.8%. The F-statistic confirmed the joint significance of all the independent variables at 1% significant level. The DW statistic was 1.853 which is not equal to 2

the standard DW value for prove of absence of any autocorrelation but it is high enough to debunk the presence of autocorrelation in the model. And in addition the test for autocorrelation using the Lagrange multiplier test of residual serial correlation as depicted in table 5 below indicates no serial correlation. The error correction term was highly significant at 1% and negative which is the appropriate sign for it. A coefficient of -0.709 is indicative of the fact that approximately 70.9% of all disequilibria from the preceding year's shock converges back to the long-run equilibrium in the existing year.

With respect to the first elasticity variable, Capital was positively related to economic growth and significant at 1% and indicated that a 1% increase in it will increase economic growth by 0.038%. The short run labour elasticity of growth according to the growth function estimated is 0.043 and highly significant at one per cent. This reemphasizes the importance of labour in the growth process of Ghana. This sign is right in the sense that, Ghana like most African countries utilizes labour intensive methods in the production of most of her output.

The expenditure variables also assumed the same sign as the long run. Capital expenditure again defied theory with its associated negative sign while the recurrent component had a positive sign but insignificant. This indeed is not strange as a number of studies have found negative relationship between government expenditure and economic growth at the aggregate level. This finding is in line with the findings of Nurudeen and Usman (2010) in Nigeria. According to Nketiah-Amponsah (2009), the reason for such a relationship stems from the need to raise taxes to finance Government spending which hurt economic growth. Economic growth suffers because; taxes bring a lot of distortions into the system. Since a higher government spending indirectly indicates a higher rate

of taxation, it is therefore logical to assume that, increased spending could suffocate economic growth in Ghana.

Trade liberalization or the degree of openness maintained its negative relationship with real GDP growth. A similar result was found by Asiedu (2010). Inflation and the level of life expectancy continued to affirm the dictates of economic theory this time with a coefficient of -0.001 and 0.002 respectively. Both inflation and life expectancy was significant at 1% level.

Diagnostic Checks

The diagnostic checks of the model presented no problem. The model was stable and the function was rightly specified. The test for autocorrelation in the model employed reported no serial correlation problems. The result of the test as displayed in table 5. The normality test was based on a test of skewness and kurtosis of the residuals. The test found no normality problem. Lastly, hetereoscedasticity was tested Based on the regression of squared residuals on squared fitted values.

Table 5 Model Diagnostics and stability Test

Test Statistics (LM version)	Probability value
Serial correlation	0.657
Functional Form	0.393
Normality Test	0.667
Hetereoscedasticity	0.174
CUSUM	stable
CUSUMQ.	stable

Calculated and generated from Microfit 5.0 Probability values are in parenthesis and relevant graphs for testing stability are provided in the appendix.

Conclusion and policy prescription

The study set out to find out the relationship between government spending and economic growth at the dis-aggregated level. The study finds a negative relationship between government investment (capital) spending and growth but a positive relation between recurrent spending and economic growth in the long run with the same relationship prevailing in the short run but with an insignificant recurrent expenditure. The negative relation could be due to the fact that, it takes a longer time to realise the returns made in popular investments by government of Ghana especially investment in education which takes a sizeable portion of government capital expenditure.

The study therefore offers the following policy recommendations; though government consumption expenditure is growth enhancing, there is the need to ensure maximum productivity in the public service in order to sustain the positive impact it has on economic growth. This could be done through the signing of performance contract with all civil servants so that all recurrent spending will be productivity enhancing.

To add more to the above, there is the need for government to critically evaluate the components of it investment spending. This is important in deciding on the particular areas that investment spending should be channeled to. Indeed, some of the investment spending projects are sometimes channeled towards politically feasible areas that are economically unviable in order to score political points. There is the need to prioritize feasible investment destinations in the country and channel government investment spending. There is also the need to check corruption in the public service in order to realize the full gain of all investment spending. The implementation of checks and balances procedures and strengthening of anti-corruption agencies is welcome in this direction likewise the elimination of majority of the human elements in the award of government investment contracts. It is also important to ensure that government spending does not compete with the private sector and crowd them out of their investment.

The study recommends for further studies an investigation into the negative relationship between economic growth and government investments (capital expenditure).

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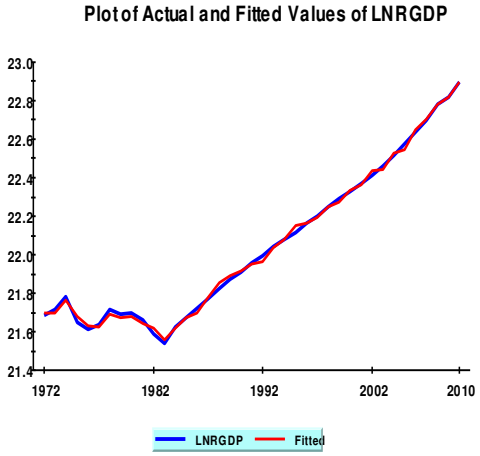
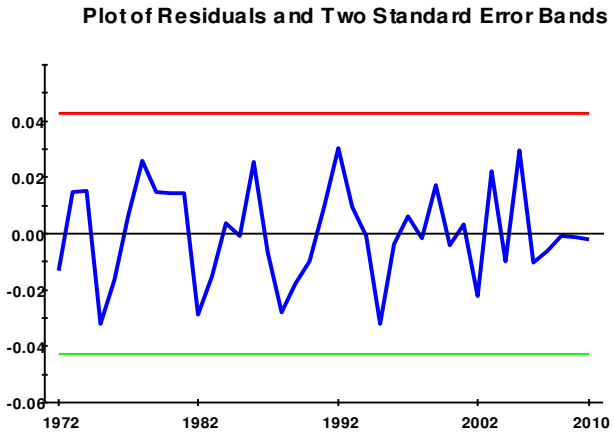
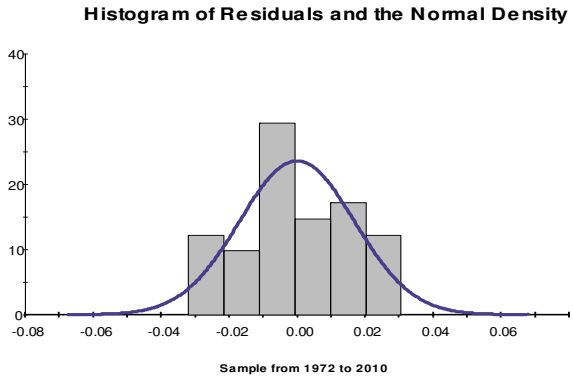
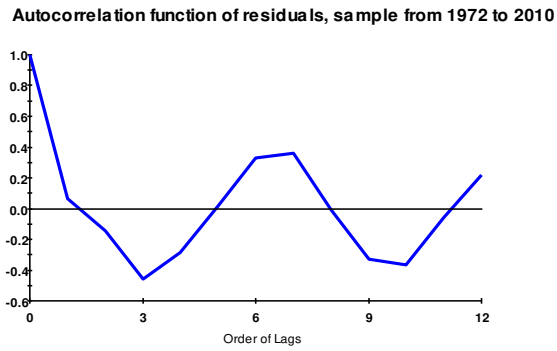
APPENDIX

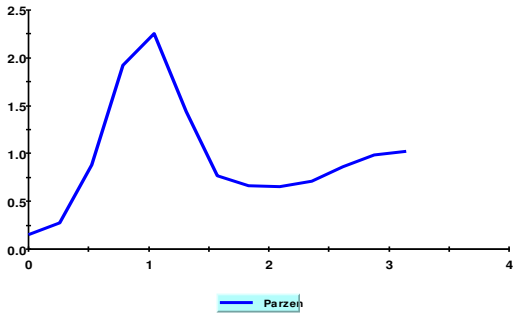

Plot of Actual and Fitted Values of LNRGDP
23.0
22.8
22.6
22.4
22.2
22.0
21.8
21.6
21.4
1972
1982
1992
2002
2010
LNRGDP
Fitted


Plot of Residuals and Two Standard Error Bands
0.04
0.02
0.00
-0.02
-0.04
-0.06
1972
1982
1992
2002
2010

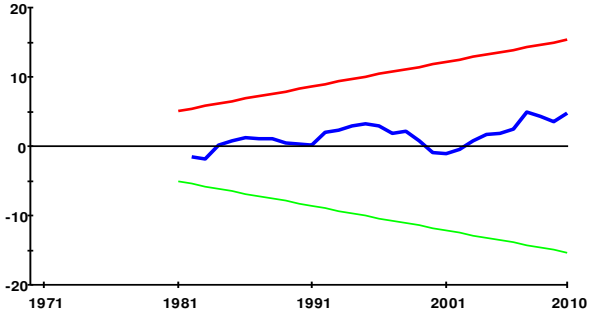

Histogram of Residuals and the Normal Density
40
30
20
10
0
-0.08
-0.06
-0.04
-0.02
0.00
0.02
0.04
0.06
Sample from 1972 to 2010


Autocorrelation function of residuals, sample from 1972 to 2010
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
0
3
6
9
12
Order of Lags

Standardized Spectral Density of Residuals (Parzen Window)

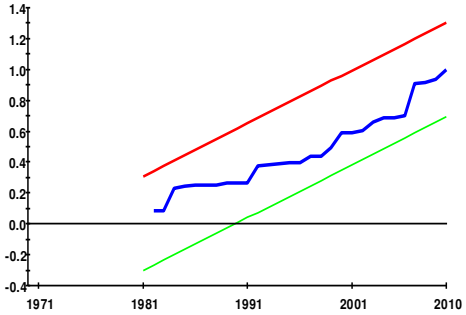


Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level