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Composition Effects of Government Expenditure on Private Consumption and Output Growth in Nigeria: a Single-Equation Error Correction Modelling

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ABSTRACT

This study examined the composition effect of government expenditure on private consumption and output growth in Nigeria using the framework of single equation error correction mechanism. The unit root and cointegration tests were conducted on the variables of interest while single equations Error Correction Models were estimated. The result suggests that government expenditures have long-run effect both on private consumption and output. The findings also revealed that government spending on education and health and social security have crowding-in effect on private consumption while other components such as government spending on administration, construction, agriculture, transport and communication have crowding-out effect on private consumption. The short-run behaviour of the model as captured by the ECM in the private consumption equation is that variables did not return to equilibrium after a short-run deviation. The finding also revealed that government spending on education and health, social security, agriculture and administration has positive effect on output while expenditure components such as government spending on construction, transport and communication have negative effect on output. The short-run behaviour of the model as captured by the ECM in the output equation is that variables did not return to equilibrium after a short-run deviation. The study also found that only two of the six components significantly influenced private consumption and output growth. The study therefore concluded that government spending on education and health, social security, agriculture and administration were growth-enhancing while government expenditure on construction, transport and communication were growth-retarding during the period under investigation.

Keywords: Output growth, government spending, composition effect, long-run effect, cointegration.

JEL Codes: C22, E62, 023, H5.

1. Introduction

After a careful observation and follow-up of the budget and budgetary process, it is gathered that the level of government expenditure in Nigeria has been increasing over time according to the available data. Many empirical studies have gone ahead to explore the effect of this increase on the key macroeconomic variables most especially real GDP. There have been mixed results across studies. This might be due to different methodological approaches adopted by most studies.

Also, there have been outcries as each year passes despite the increase in government spending as regard workers' take-home pay. Despite the huge amount government allocates to offset the wage bill in the public sector, the country has experienced in the past and even in the recent time several industrial unrests as a result of continuing agitation for increase in wages. Government has responded on several occasions by increasing the minimum wage from existing level to another level after due consultations with the stakeholders in the economy. The most recent of these, is the new minimum wage of Eighteen Thousand Naira (₦18,000) which the federal government announced for all workers in Nigeria in the year 2010. There is no doubt that this increase would lead to further increase in government spending and it is expected to have a kind of multiplier effect on the economy. The workers would have access to more funds to improve their skills through further education and training, feed on balanced diet to improve their health conditions and afford to have access to advanced or modern Tele-communication equipment such as computers of higher grades, mobile phones etc. It would also lead to increased access to financial market, medical facility and automobile equipment such as cars for easy transportation, etc. Moreover, it should be noted that, tax revenue yields to the government would also increase because tax system is made progressive; i.e. the tax paid is a function of income received. Another thing is that personal saving would rise since not all aspects of the increase in wage would be put on consumption. Part of the income stream would leak into saving which would further be re-invested into the economy to boost output in the real sector. If this process works as specified, it means government expenditure is growth-enhancing and output growth also enhances government expenditure growth. Why then do government and workers drag the issue too long to degenerate into crisis whenever there is agitation for increase in wages since such increase is expected to produce positive growth-effect?

The debate on the links between government expenditure growth and key macroeconomic variables has however been left inconclusive as revealed by the empirical findings.

This inconclusive nature of the debate has aroused the interest of many emerging scholars to carry out further empirical studies on this topical issue.

Empirical studies revealed that government expenditure has been rising across economies and across time but this increase has not produced the same effect across time and across regions leading to a doubt as per the efficacy and potency of the Keynesian fiscal policy as a veritable instrument of economic stabilization.

Several empirical studies have been conducted, among which we have Wagner (1890), Peacock and Wiseman (1979), Friedman, Buchanan and Wagner (1978), Barro (1990), Barro and Sala-i-Martin (1992), Abdullah (2000), Chang, et al (2002), Tulsidharan, (2006), Baghestani and AbuAl-Foul (2004), Pekarski

(2010), Olugbenga and Owoeye (2007), Cooray (2009), Abu and Abdullahi (2010), Loizides and Vamvoukas,(2005), Kolluri, Panic and Wahab (2000), Komain and Brahmasrene, (2007), Bakare and Olubokun (2011) etc. The findings have been mixed as regards the links between government expenditure growth and key macroeconomic variables such as private consumption, inflation and real per capita GDP. The existing works focusing on the composition effect of government expenditure have left some gaps in the area of methodological approaches, time frame and measurement of variables. Also, among studies using disaggregated and sectoral approach, a few of them if not none have so far addressed the composition effect of government expenditure between 1961 and 2010 using the framework of single equation error correction modeling.

On this note this study attempts to examine the composition effect of government expenditure on private consumption and output growth in Nigeria between 1961 and 2010.

The rest of this paper is organized as follows: The next section gives a brief theoretical and empirical literature review. Section 3 describes the data and econometric methodology used to achieve the study objective. Section 4 reported the empirical findings while section 5 presents the summary, recommendation and conclusion.

2. Theoretical and Empirical Literature Review

Keynesian economics often argue that private sector decisions sometimes lead to inefficient macroeconomic outcomes which require active policy responses by the public sector, in particular, monetary policy actions by the Central Bank and fiscal policy actions by the government, in order to stabilize the economy over the business cycle. Lord Maynard Keynes submitted that government visible hand is needed to put the economy in the right perspective. This is contrary to the Classical theory which held the opposite view of price mechanism that is the invisible hand of market forces should be allowed to drive the economy. As state roles in the economy increase, government expenditure would also increase, Wagner (1890). Government expenditure has been adjudged by empirical literature as the best fiscal tool to correct the anomalies in the economy.

According to Rostow (1971), growth in public expenditure is better explained in terms of the changes in the levels of development of the country's economy. For instance, less developed countries at their cradle of development require higher levels of investments in order to create necessary infrastructure for gainful economic breakthrough. As such economies approach maturity of economic development, much of the further public expenditure would basically be prompted by repeated market failures. A fuller discussion of these theories can be found in Rosen (1995) and Agiobenebo, et al (2000).

However, it has been argued that government fiscal policy (intervention) helps to improve failure that might arise from the inefficiencies of the market system.

According to Akpan (2005), public expenditure has been expanding for decades in Nigeria. This observed growth in public spending appears to apply to most countries regardless of their level of economic development. This implies that growth in government spending over time has not enhanced economic growth and development in these countries.

Turnovsky (2004) opined that within theories of economic growth and development, fiscal policy changes can have growth impact that last for transitions of up to several decades. There is increasing empirical evidence in support of these model predictions. Authors such as Aschauer (2000), Milbourne et al. (2003), Ramirez and Nazmi (2003), Haque (2004), Gupta et al. (2005), Mamanja and Morrissey (2005) and Bose et al. (2007) provide empirical evidence linking government spending with economic growth among developing countries. They found positive link between public capital relative to consumption expenditure and the rate of economic growth. Similar results were found from aggregating government expenditure data in the works of Adam and Bevan (2005), Lopéz and Miller (2009), and Hong and Ahmed (2009). They argued that increased productive government expenditure, generally believed to include spending on energy, transport, communication; education and health have significant positive long-run growth-effect.

On the basis of individual expenditure components, Albala-Bertrand and Mamatzakis (2001), Milbourne et al. (2003), Haque and Kim (2003), and Fedderke et al. (2006) examined the link between government expenditure and macroeconomic variables. They found positive growth-effect associated with greater infrastructure spending, while Milbourne et al. (2003), Ramirez and Nazmi (2003), and Bose et al. (2007) found similar results for education spending.

Ogujiuba and Adeniyi (2004) examined the impact of government spending on education on economic growth. The result of the study showed a statistically significant positive relationship between economic growth and recurrent expenditure on education, while capital expenditure was wrongly signed and not significant in its contributions. Lawanson (2009) took this study further by including both the health and education expenditures in her model. Her objective was to examine the role of human capital investment (proxied by total government expenditure on education and health) on economic growth in Nigeria. After regressing GDP on government expenditure on education, government expenditure on health and the enrolment rates, she found out that a clear relationship existed between education spending and economic growth. However, unlike the study by Ogujiuba and Adeniyi (2004), the study did not disaggregate expenditure figures on health and education into the recurrent and capital components but treated health spending separately from education spending. This might affect the results since both education and health as social goods could be referred to as complementary goods for productivity. Before any spending on education could have any impact on productivity it must have been augmented with good health condition. Education affects health, health also affects productivity. It is much more likely to have different results when these two components of government expenditure are treated as one component and aggregated as well.

This study differs from prior studies by including government expenditure in each of the functional areas such as administration with defence and internal security inclusive, agriculture, education and health, transport and communication, construction and social security. This study decomposed government spending into six functional areas very crucial to growth of the economy. This would help in identifying which component is growth-enhancing and which is growth-retarding.

3. Data and Econometric Methodology

The study cover the period from 1961-2010. The reason for the selection of the time period is the consideration for the availability of data which is the major ingredient in any empirical investigation. This time frame is also long enough to enhance the econometric performance of the models constructed for the attainment of the study objectives.

The variables selected for the study include government expenditure on administration (GEXPADM), government expenditure on education and health (GEXPEDUHT) and government expenditure on agriculture (GAGR). Others include government expenditure on construction (GCONSTRU), government expenditure on transport and communication (GTRANSCOM) and government expenditure on social security (GTRANF). We also have Stock of Money in the economy (M2PCGDP), and Private consumption expenditure (PCEXPGRT).

The study formulates two models.

Model 1 examines the composition effect of government expenditure on private consumption in Nigeria.

$$PCEXPGRT = f(GCEXPGRT, M2) \qquad (1)$$

Model 2 examines the composition effect of government expenditure on output growth in Nigeria

$$GDPCBPRGRT = f(GCEXPGRT, M2) \qquad (2)$$

$M2$ enters each of the models as a complementary explanatory variable.

Decomposing government expenditure into six components and expressing equations (1) and (2) in linear econometric form, we have:

$$LP_t = \alpha_0 + \alpha_1 LG_{1t} + \alpha_2 LG_{2t} + \alpha\varphi_3 LG_{3t} + \alpha_4 LG_{4t} + \alpha_5 LG_{5t} + \alpha_6 LG_{6t} + \alpha_7 M_t + U_{1t} \qquad (3)$$

From equation (3), we derive

$$U_{1t} = LP_t - \alpha_0 - \alpha_1 LG_{1t} - \alpha_2 LG_{2t} - \alpha\varphi_3 LG_{3t} - \alpha_4 LG_{4t} - \alpha_5 LG_{5t} - \alpha_6 LG_{6t} - \alpha_7 M_t \qquad \mathbf{(4)}$$

If variables in equation (3) are non-stationary particularly they are individually I(1) but U_{1t} turns out to be stationary i.e. $U_{1t} \sim I(0)$, equation (3) is no longer spurious. All variables involved in the regression equation (3) are said to be cointegrated. This equation therefore is referred to as cointegrating regression while the slope parameters ($\alpha_1 1 \ldots \alpha_1 7$) are referred to as the cointegrating parameters. In this case, there are seven cointegrating parameters.

$$LY_t = \beta_0 + \beta_1 LG_{1t} + \beta_2 LG_{2t} + \beta_3 LG_{3t} + \beta_4 LG_{4t} + \beta_5 LG_{5t} + \beta_6 LG_{6t} + \beta_7 M_t + U_{2t} \qquad (5)$$

From equation (5), we derive

$$U_{2t} = LY_t - \beta_0 - \beta_1 LG_{1t} - \beta_2 LG_{2t} - \beta_3 LG_{3t} - \beta_4 LG_{4t} - \beta_5 LG_{5t} - \beta_6 LG_{6t} - \beta_7 M_t \quad (6)$$

Also in equation (5), if variables are non-stationary particularly if they are individually I(1) but U_{2t} turns out to be stationary i.e. $U_{2t} \sim I(0)$, equation (5) is no longer spurious. All variables involved in the regression equation (5) are said to be cointegrated. This equation therefore is also referred to as cointegrating regression while the slope parameters ($\beta_1 1 \ldots \beta_1 7$) are referred to as the cointegrating parameters. In this case, there are seven cointegrating parameters. By implication, the parameters of equations (3) and (5) can be interpreted as long-run parameters.

After confirming the existence of cointegration by testing U_{1t} and U_{2t} for unit root using regression equation of the form:

$$\Delta\hat{U} = \rho\hat{U}_{t-1} \quad (7)$$

The hypothesis to be tested is H_0 : ρ=1 as against H_1 : ρ≠1. If the null hypothesis of a unit root is rejected on the residuals in the two models, it shows that variables in each of the models converge to a long-run equilibrium. In this case, there is tendency for short-run deviation from equilibrium meaning that disequilibrium might have set in, in the short-run. The error terms in the two models are therefore treated as equilibrium error. To capture the short-run behaviour in the models, we introduce the Error Correction Mechanism (ECM). This corrects for disequilibrium in the behaviour of each of the models. For model 1, we obtain the ECM specification of equation (3) as:

$$\Delta LP_t = \varphi_0 + \varphi_1 \Delta LG_{1t} + \varphi_2 \Delta LG_{2t} + \varphi_3 \Delta LG_{3t} + \varphi_4 \Delta LG_{4t} + \varphi_5 \Delta LG_{5t} + \varphi_6 \Delta LG_{6t} + \varphi_7 \Delta M_t + \varphi_7 U_{1t-1} + e_{1t}$$

Where Δ is the first difference operator, e_{1t} is a random error term and,

$$U_{1t-1} = LP_{t-1} - \alpha_0 - \alpha_1 LG_{1t-1} - \alpha_2 LG_{2t-1} - \alpha_3 LG_{3t-1} - \alpha_4 LG_{4t-1} - \alpha_5 LG_{5t-1} - \alpha_6 LG_{6t-1} - \alpha_7 M_{t-1}$$

Also, for model 2, we obtain the ECM specification of equation (5) as:

$$\Delta LY_t = \Psi_0 + \Psi_1 \Delta LG_{1t} + \Psi_2 \Delta LG_{2t} + \Psi_3 \Delta LG_{3t} + \Psi_4 \Delta LG_{4t} + \Psi_5 \Delta LG_{5t} + \Psi_6 \Delta LG_{6t} + \Psi_7 \Delta M_t + \Psi_7 U_{2t-1} + e_{2t}$$

Where Δ is the first difference operator, e_{2t} is a random error term and $U_{2t-1} = LY_{t-1} - \beta_0 - \beta_1 LG_{1t-1} - \beta_2 LG_{2t-1} - \beta_3 LG_{3t-1} - \beta_4 LG_{4t-1} - \beta_5 LG_{5t-1} - \beta_6 LG_{6t-1} - \beta_7 M_{t-1}$

4. Empirical Analysis

Description of data

We use GDP to proxy output growth measured in millions naira from 1961 to 2010. Private consumption was measured using its annual growth rate. The money sector was measured using broad money as a percentage of GDP. Each of the government expenditure variables are measured in millions naira for each year. All variables are expressed in log form except private consumption and money stock. Based on the trend analysis as evidenced in the graphical presentation in Figure 2 in the Appendix, the growth pattern of each series has been a kind of wave length, it has not been all that smooth. We found a kind of upward and downward trend in the growth pattern.

In order to capture the necessary information on the statistical properties of each of the data series, we conducted a descriptive analysis and the result is presented in Table 1. The mean and standard deviation of each variable are computed as shown in the table. It is evidenced from the table that all variables are normally distributed with only an exception, the monetary variable.

Table 1 Results of descriptive analysis

	LOG(GDPCBPR)	LOG(GEXPADM)	LOG(TRANCOM)	LOG(GOVTRANSF)	LOG(EDUHEALTH)	LOG(CONSTRUC)
Mean	12.00	8.26	5.52	8.53	6.33	5.71
Median	11.13	7.27	4.02	8.60	5.96	5.03
Maximum	17.02	14.00	12.09	13.52	11.09	11.84
Minimum	7.77	2.69	1.06	-1.83	0.85	-1.47
Std. Dev.	3.10	3.32	3.06	3.91	2.91	3.21
Skewness	0.22	0.20	0.55	-0.77	-0.11	0.10
Kurtosis	1.70	1.80	2.09	2.88	1.78	2.33
Jarque-Bera	3.89	3.33	4.28	4.99	3.19	1.01
Probability	0.14	0.19	0.12	0.08	0.20	0.60
Sum	599.85	412.90	275.90	426.40	316.34	285.32
Sum Sq. Dev.	472.24	538.88	460.18	749.04	414.97	504.10
Observations	50	50	50	50	50	50

Source: *Author's own computation*

The unit root test

The econometric analysis of the data begins by identifying the order of integration of the series using Augmented Dickey Fuller unit root test. The ADF test is conducted using the regression of the form

$$\Delta Z_t = \delta_0 + \delta_t + \Omega Z_{t-1} + \sum_{i=1}^{k} \lambda_i \Delta Z_{t-i} + \epsilon_t \qquad (12)$$

Where ΔZ_t are the first differences of the series(Z_t), k represents the lag order, ϵ_t is the disturbance error term and t stands for time.

Naturally the ADF tests were performed by testing ($H_0 : \Omega = 0$) against the one-sided alternative,

$(H_1 : \Omega > 0)$ in equation 12. The unit root tests were carried out with a drift as well as time trend for each variable. To carry out the unit root test, the ADF statistics were tested against the 5% MacKinnon critical values.

The result as presented in Table 2 shows that four of the variables used in this study are stationary while five are non-stationary. The hypothesis of a unit root was rejected at 5% significance level for each of the four variables while this hypothesis was upheld for each of the remaining five variables. This implies that four out of the nine variables used in this study followed a I(0) process while the remaining five variables followed a I(1) process since the first differences of these five variables are stationary.

Also, from this table, we can conclude based on Engle-Granger cointegration approach that variables in each of the two models cointegrate since the residual series obtained from the level regression in each model followed a I(0) process. We also present the residuals for each model graphically as shown in Figure 1 in the Appendix. This provides a further evidence of the stationarity of the residuals in each of the models.

Table 2 Results of Augmented Dickey-Fuller unit root test

Variables	ADF-Statistics	5% critical value	Remark	Order of Integration
LGDPCBPR	-2.384	-3.504	NS^	
ΔLGDPCBPR	-5.257*	-3.506	S^	I(1)
LGEDUHTH	-5.014	-3.504	S^	I(0)
LGAGR	-3.68	-3.504	S^	I(0)
LGCONSTR	-3.902	-3.504	S^	I(0)
LGTRANSCOM	-2.347	-3.504	NS^	
ΔLGTRANSCOM	-9.094*	-3.506	S^	I(1)
LGEXPADM	-2.724	-3.504	NS^	
ΔLGEXPADM	-7.158*	-3.509	S^	I(1)
LGTRANF	-2.969	-3.504	NS^	
ΔLGTRANF	-7.287*	-3.509	S^	I(1)
M2PCGDP	-3.327	-3.504	NS^	
ΔM2PCGDP	-7.145*	-3.509	S^	I(1)
PRCEXPGRT	-4.931	-3.504	S^	I(0)
ECM^{gdp}	-11.35	-1.95	S^	I(0)
ECM^{prcexp}	-8.34	-1.95	S^	I(0)

Note: *(*) indicates significant at 5% level, S = Stationary, NS = Non-stationary, (^) indicates test conducted with drift and time trend*

Cointegration Test

The study also employed Johansen multivariate cointegration technique to confirm the existence of cointegration among the variables included in each of the two models. The result as shown in Table 3 indicates that variables converge to a long-run equilibrium in each of the models. Both the Trace and Maximum Eigen tests reject the hypothesis of no cointegration. While the two tests established the same number of cointegrating vectors of two in model 2, they established different number of cointegrating vectors in model 1. Trace test statistic suggested three cointegrating vectors while Maximum Eigen test statistic suggested four cointegrating vectors. The evidence of cointegration from both Engle-Granger and Johansen cointegration tests conflicts with the findings of Tang (2001) and Babatunde (2009) while it corroborates the findings of Singh and Weber (1997), Jackson (1990) and Usman et al (2011).

Table 3 Results of Johansen cointegration test

Hypotesized Number of Cointegrating Equations	Eigen Value	Trace Statistic	Critical Value At 5% (p-value)	Maximum Eigen Statistic	Critical Value At 5% (p-value)
Model 1: Government Expenditure and Private consumption					
None	0.80	229.36*	159.53(0.0000)	76.18*	52.36(0.0000)
At most 1	0.62	153.18*	125.62(0.0004)	46.82*	46.23(0.0432)
At most 2	0.60	106.36*	95.75(0.0076)	43.97*	40.08(0.0173)
At most 3	0.51	62.39	69.82(0.1695)	34.39*	33.88(0.0434)
At most 4	0.21	28.00	47.86(0.8139)	11.44	27.58(0.9530)
At most 5	0.20	16.56	29.80(0.6722)	10.97	21.13(0.6502)
At most 6	0.11	5.59	15.49(0.7434)	5.47	14.26(0.6816)
At most 7	0.00	0.12	3.84(0.7302)	0.12	3.84(0.7302)
Model 2: Government Expenditure and Output Growth					
None *	0.81	233.32	159.53(0.0000)	78.60	52.36(0.0000)
At most 1 *	0.72	154.72	125.62(0.0003)	60.90	46.23(0.0008)
At most 2	0.53	93.83	95.75(0.0674	36.74	40.08(0.1134)
At most 3	0.44	57.09	69.82(0.3355)	27.53	33.88(0.2360)
At most 4	0.25	29.56	47.86(0.7413)	13.99	27.58(0.8231)
At most 5	0.19	15.56	29.80(0.7425)	9.82	21.13(0.7609)
At most 6	0.11	5.74	15.49(0.7261)	5.68	14.26(0.6548)
At most 7	0.00	0.06	3.84(0.8053)	0.06	3.84(0.8053)

Note: *(*) denotes rejection of the hypothesis of no cointegration at the 5% level*

Model 1: composition effect of government expenditure on private consumption

Model 1 examined how private consumption responds to changes in different components of government spending. From the result in Table 4, it is revealed that private consumption responds positively to changes in government spending on education and health as well as social security. This implied that as government expenditure on education and health as well as social security increased, private consumption was induced showing a crowding-in effect of these components on private consumption during the period under investigation. However, other components such as government spending on administration, construction, agriculture, transport and communication crowded out private consumption, since each of these components has negative effect on private consumption. The negative response of private consumption to increase in these variables is an indication of crowding-out effect. The short-run behaviour of the model as captured by the ECM is that variables did not return to equilibrium after a short-run deviation. This is revealed by the coefficient of the error correction mechanism in model 1 which is positive and insignificant as against a priori expectation. The recorded Durbin-Watson statistic as shown in the table implied that there is absence of serial correlation as this statistic is within the acceptable limit to reject the hypothesis of serial correlation. Also, the low R-squared coupled with insignificance of most of the estimated parameters allays any fear as regard the

performance of the model as it becomes a problem when R-squared is high with individual t-statistic insignificant. The study also conducted further diagnostic tests such as LM test for serial correlation and White Heteroscedasticity test. The LM test suggests that there is absence of serial correlation [LM – 1.7(0.2)]. The White heteroscedasticity test reveals that there is no problem of heteroscedasticity [White Heteroscedasticity 0.38(0.94)] which implies that residuals are homoscedastic. This tells on the robustness of the error correction model used to model the response of private consumption to changes in different components of government spending. The positive link between private consumption expenditure and two of the components of government spending agrees with the findings of Ariyo and Raheem (1991), Martin and Wasow (1992), Blejer and Khan (1984) and Moshi and Kilindo 1999) but negates the findings of Asante (1993).

Table 4 Regression results

Dependent Variable: PRCEXPGRT				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGEDUHTH	6.173322	3.466699	1.780749	0.0827
LGCONSTRUC	-1.868524	3.972227	-0.470397	0.6407
LGAGR	-3.044605	4.089460	-0.744501	0.4610
DLGEXPADM	-13.55678	12.14550	-1.116198	0.2712
DLGTRANCOM	-6.846833	5.707732	-1.199572	0.2375
DLGTRANSF	2.305621	3.297982	0.699101	0.4886
DM2PCGDP	0.358024	0.238404	1.501754	0.1412
ECM^{prcexp} (-1)	0.199600	0.215751	0.925141	0.3606
C	8.041515	12.50453	0.643088	0.5239
R-squared	0.278759	Mean dependent var		18.19926
Adjusted R-squared	0.130812	S.D. dependent var		24.20441
S.E. of regression	22.56583	Akaike info criterion		9.238111
Sum squared resid	19859.45	Schwarz criterion		9.588961
Log likelihood	-212.7147	Hannan-Quinn criter.		9.370698
F-statistic	1.884183	Durbin-Watson stat		1.731123
Prob(F-statistic)	0.090534			

Model 2: composition effect of government expenditure on Output Growth

Model 2 examined how output responds to changes in different components of government spending. From the result in Table 5, it is revealed that output responded positively to changes in government spending on education and health, social security, agriculture and administration of which defence and internal security is inclusive. This implied that as government expenditure on these variables increased, output also increased showing that these components stimulated output growth during the period under investigation. However, output responded negatively to other components such as government spending on construction, transport and communication. These components have negative effect on output. Any increase in these variables led to a reduction in the national output. The short-run

behaviour of the model as captured by the ECM is that variables did not return to equilibrium after a short-run deviation. This is revealed by the coefficient of the error correction mechanism in model 2 which is positive and insignificant as against a priori expectation. The recorded Durbin-Watson statistic as shown in the table showed that there is absence of serial correlation as this statistic is within the acceptable limit to reject the hypothesis of serial correlation. Also, the low R-squared coupled with insignificance of most of the estimated parameters eliminates any fear as regard the performance of the model as it becomes a problem when R-squared is high with individual t-statistic insignificant. We also conducted further diagnostic tests such as LM test for serial correlation and White Heteroscedasticity test. The LM test suggests that there is absence of serial correlation [LM – 1.02(0.37)] while White heteroscedasticity test reveals that there is no problem of heteroscedasticity [White Heteroscedasticity 0.99(0.60)] which implies that residuals are homoscedastic. This has implication on the robustness of the error correction model used in this study to capture the composition effect of government expenditure on output growth in Nigeria. The positive relationship established between output growth and most government expenditure components agrees with the findings of Lawanson (2009), Aregbeyen (2007), Ekpo (1994), Amin (1998), Devarajan et al. (1996), Fluente (1997), Kneller et al. (1999), Bose et al. (2003) and Bakare (2011), but does not conform with the findings of Akpan (2005) , Maku (2009) and Abdullahi (2010)

Table 5 Regression results

Dependent Variable: DLGDPCBPR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLGEXPADM	0.095755	0.102613	0.933163	0.3565
DLGTRANCOM	-0.040683	0.044902	-0.906036	0.3705
DLGTRANSF	0.012357	0.026768	0.461628	0.6469
LGEDUHTH	0.047158	0.027213	1.732904	0.0910
LGCONSTRUC	-0.070792	0.031558	-2.243246	0.0306
LGAGR	0.035381	0.032493	1.088882	0.2829
DM2PCGDP	0.001521	0.001869	0.813598	0.4208
ECM^{gdp} (-1)	0.068573	0.099667	0.688019	0.4955
C	0.113131	0.098850	1.144474	0.2594
R-squared	0.263618	Mean dependent var		0.192831
Adjusted R-squared	0.112566	S.D. dependent var		0.188213
S.E. of regression	0.177304	Akaike info criterion		-0.454545
Sum squared resid	1.226027	Schwarz criterion		-0.103695
Log likelihood	19.90908	Hannan-Quinn criter.		-0.321958
F-statistic	1.745207	Durbin-Watson stat		1.954893
Prob(F-statistic)	0.118533			

5. Summary, Recommendations and Conclusion

This study attempted to examine the composition effect of government expenditure on private consumption and output growth in Nigeria using the framework of single equation error correction mechanism.

The study covered the period from 1961-2010. The study selected the variables such as government expenditure decomposed into six components namely government expenditure on administration of which defense and internal security is inclusive (GEXPADM), government expenditure on education and health (GEXPEDUHT), government expenditure on agriculture (GAGR), government expenditure on construction (GCONSTRU), government expenditure on transport and communication (GTRANSCOM) and government expenditure on social security (GTRANF). Other variables included are GDP at current basic prices, Stock of Money in the economy (M2PCGDP) and Private consumption expenditure (PCEXPGRT).

We constructed two models. The first examined the composition effect of government expenditure on private consumption while the second explored the composition effect of government expenditure on output growth in Nigeria. The order of integration of the series was identified using ADF unit root test. Engle-Granger and Johansen cointegration techniques were used to determine the cointegrating relationship among the variables used in each of the two models. We later estimated the error correction models for both private consumption and output. The result showed that four of the nine variables used in this study are stationary at level while the remaining five are non-stationary in their level forms. They however became stationary after first differencing. Both the Engle-Granger and Johansen cointegration tests confirmed the existence of cointegration among the variables used in each of the estimated models. This suggests that government expenditures have long-run effect both on private consumption and output. The findings also revealed that government spending on education and health as well as social security has crowding-in effect on private consumption. However, other components such as government spending on administration, construction, agriculture, transport and communication have crowding-out effect on private consumption. The short-run behaviour of the model as captured by the ECM in the private consumption equation is that variables did not return to equilibrium after a short-run deviation. It is also revealed from the findings of this study that government spending on education and health, social security, agriculture and administration has positive effect on output while expenditure components such as government spending on construction and transport and communication have negative effect on output. The short-run behaviour of the model as captured by the ECM in the output equation is that variables did not return to equilibrium after a short-run deviation. The study also found that only two of the six components significantly influenced private consumption and output growth. Government needs to demonstrate high level of transparency and prudency in the budgetary allocation and execution to ensure an effective management of public funds to prevent leakages as a result of contracts inflation and looting of treasury which are the symptoms of high level of corruption and ineptitude characterizing most developing countries.

The study therefore concluded that government spending on education and health, social security, agriculture and administration were growth-enhancing while government expenditure on construction and transport and communication were growth-retarding during the period under investigation.

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Appendix

Figure 1 Graphs of the Residuals showing the stationarity properties

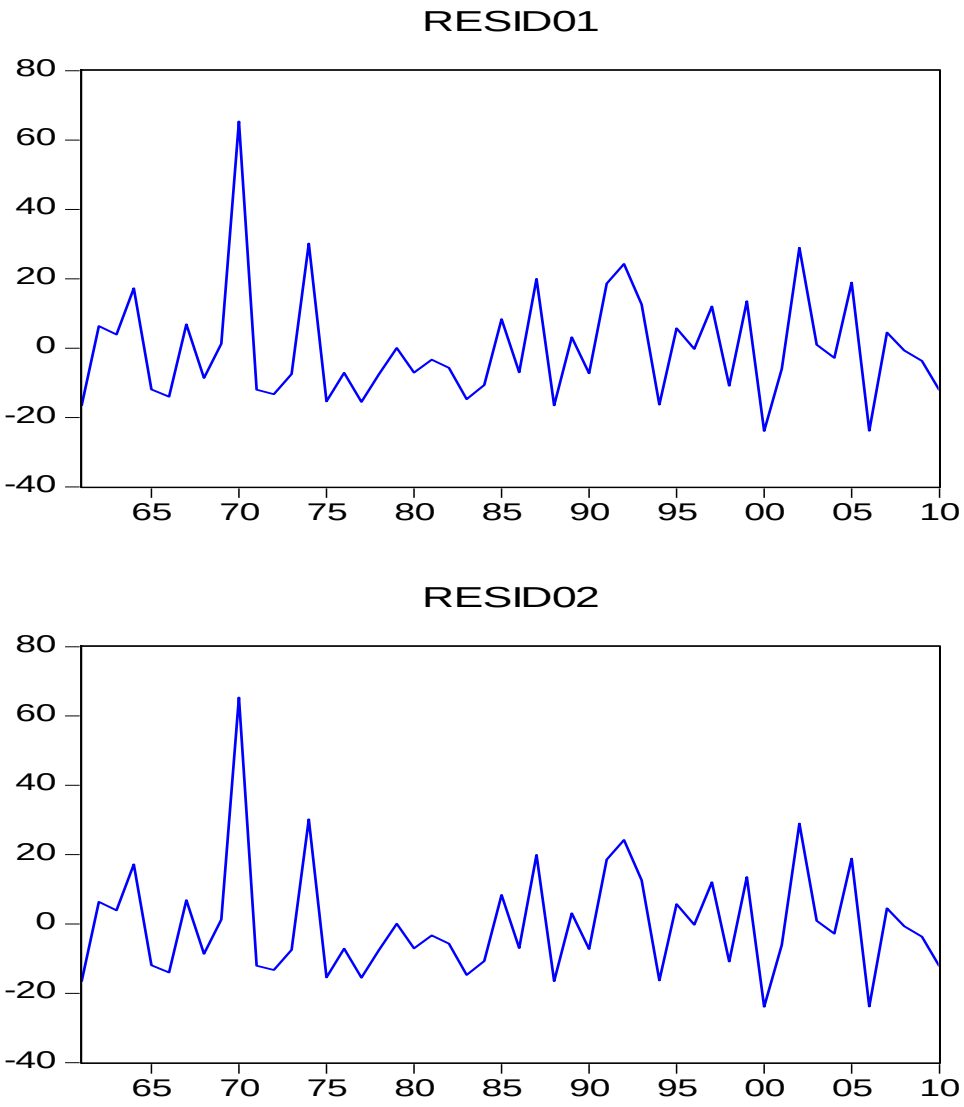

Figure 2 Graphs revealing the trends in each of the data series