













regard, the above cointegration vector results as rewritten in the form of equation below disclosed the signs of the coefficients of the various variables of aggregated and disaggregated components of capital expenditures.  
 $GDP = 180.2160CER - 515.4073CEA + 584.7959CEE - 471.1180CEH - 2860.122C \dots Eq.1B$

Equation.1B showed that capital expenditure on roads and education has positive long-run effect on economic growth, while capital expenditure on agriculture and health has long-run negative effect on economic growth.

**Vector Error Correction Model (VECM):** As cointegration is proven, an error correction framework is constructed to model dynamic response that indicates the speed of adjustment from the short-run to the long-run equilibrium state. The essence is to affirm the existence of a co-integrating vector among the variables. Then, ECM is employed. This is based on the general-to-specific rule, and the results are presented in Table 4 below.

**Table 4:** Error Correction Test Results for the Model.

Explanatory variables	Dependent variable: GDP
ECM <sub>-1</sub>	0.093118
	-0.16267
C	1987.748**

**Table 5:** Pair-wise Granger-causality Tests between GDP and Components of Government Capital Expenditure

Sample: 1981 2013					
Lags: 2					
Null Hypothesis:	Obs	F-Statistic	Probability	Decision	Direction
CER does not Granger Cause GDP	31	6.85673	0.00406	Reject	Causality
GDP does not Granger Cause CER		0.69428	0.50846	Accept	No causality
CEA does not Granger Cause GDP	31	20.0167	5.5E-06	Reject	Causality
GDP does not Granger Cause CEA		7.08664	0.00350	Reject	Causality
CEE does not Granger Cause GDP	31	4.68287	0.01833	Reject	Causality
GDP does not Granger Cause CEE		0.50349	0.61019	Accept	No causality
CEH does not Granger Cause GDP	31	62.8412	1.1E-10	Reject	Causality
GDP does not Granger Cause CEH		5.16544	0.01291	Reject	Causality

**Source:** Output data

To categorically investigate the impact level of government expenditure on Economic Growth in Nigeria, Granger-causality approach is adopted. The results are shown on Tables 5 above. The criterion is to reject the null hypothesis when the value of the probability of F-statistic is less than the critical value at 5%. The disaggregated causal relationship is reported in Table 5. The table shows the results of Pair-wise Granger-causality tests between GDP and components of government capital expenditures (CER, CEA, CEE, and CEH) on economic growth (GDP). The results indicate that unidirectional causality runs from economic growth (GDP) to capital expenditure on roads (CER). There is bi-directional causal effect between GDP and CEA, between GDP and CEH. Furthermore, another unidirectional causality runs from CEE to GDP; The results show that capital expenditures on economic services represented by roads and agriculture, and on social and community services represented by education and health cause economic growth.

	-972.935
CER	31.72887
	-66.4851
CEA	95.46489
	-70.5112
CEE	-136.1307
	-261.805
CEH	-235.7516**
	-65.5056
Adjusted R-squared	0.334777
F-statistic	3.516279

Standard errors in parentheses. \*\*\*, \*\*, \* denote statistical significance at the 1, 5, 10 percent level

The regression result above defies the 'a priori' expectations that the independent variables of government expenditure should positively affect economic growth. The ECM is not rightly signed. It shows that distortions in economic growth in Nigeria caused by government capital expenditure patterns are not reversible. The adjusted R<sup>2</sup> is 33% which indicates that greater proportion of the issues in economic growth is not explained by government capital expenditure.

## 5. Discussion of Findings

It was found that there is long-run equilibrium relationship between capital expenditure and economic growth in Nigeria. Contrary to the *a priori* expectation of this study, capital expenditure on agriculture and capital expenditure on health care have negative effect on economic growth as against our results with capital expenditure on education and capital expenditure on road construction which have positive effect on economic growth. The a priori expectation is that both the level and composition of public capital expenditures have positive effect on the economic growth in Nigeria. The negative signs of capital expenditure on agriculture and capital expenditure on health care, and the positive signs of capital expenditure on education and capital expenditure on road construction are mix-up in terms of Nworji, et al (2012) study which indicated that capital expenditure on social and community services has positive signs, while capital expenditure on economic services has negative signs.

Our findings are also inconsistent with Abu and Abdullah (2010) and Olabisi (2012) studies which indicated that capital expenditure on education have negative effect on

economic growth, while capital expenditure on health has positive effect in Nigeria. However, our finding that capital expenditure on education has positive effect on economic growth is in line with Dauda (2011). All these discrepancies could be attributed data coverage and perhaps method of data analysis. The contradictory results obtained in all of these are not surprising. Abas (2001) in Qadri and Waheed (2011) suggested that human capital variables (education & health) in any economy attract investment in physical capital which in turn increases output. He explained that education affects output through various channels, namely;

1. The knowledge gained from education increases the capacity to produce more in relatively smaller time.
2. Increased level of education leads to better health.
3. Education provides one with awareness of the benefit of healthy living.
4. A healthy person has a better and greater productive capacity.

In other words, capital expenditures on education and health should affect economic growth positively. The results of our findings are inconsistent with Adewara and Oloni (2012) in terms of capital expenditures on agriculture and capital expenditures on health care. It was discovered that the variables have positive signs in Nigeria.

## 6. Conclusions and Recommendations

Based on ECM tests, it was found that capital expenditures on agriculture, education and road have no significant effect on economic growth, while capital expenditures on health has significant and negative effect on economic growth. On the whole, government capital expenditure does not significantly affect economic growth in Nigeria. As indicated by adjusted  $R^2$ , only about 33% of the variations in economic growth are attributed to capital expenditures. Thus, greater percentage of variations in economic growth is attributed to other factors. Wagner's (1883) Law applies in Nigeria with respect to capital expenditures on economic services, while Keynes (1936) view equally applies with respect to social and community services.

The first case is demonstrated in the Granger-causal test results in which unidirectional causal effect runs from economic growth to capital expenditure on road and capital expenditure on agriculture; while the second case is reflected in unidirectional causal effect with direction running from capital expenditure on education to economic growth and capital expenditure on health to economic growth. Based on the findings, the following recommendations were made, namely; Government should set up appropriate monitoring mechanism to ensure that funds are not misappropriated, and that adequate funds are applied to areas of needs especially agriculture and education which revealed negative signs. The existing agencies like EFCC and ICPC should be overhauled to ensure that proper persons are put in place. There has been public outcry that the officials of these agencies are being checkmated to the extent that they look the other way in the performance of their duty.

For further studies, we recommend the inclusion of my capital expenditure variables in the model.

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