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Domestic Investment and Economic Growth in Nigeria From 1970-2013: An Econometric Analysis

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Abstract

This study examines the impact of domestic investment on economic growth in Nigeria using annual time-series data from 1970-2013. Multiple regression and co-integration methods were employed to analyze the data. The objectives of this study includes: To examine the impact of private and public investment on economic growth and to analyze the trends of private investment, public investment and economic growth in Nigeria from 1970- 2013. The study divided government expenditure into productive and protective expenditures, and found out the crowding in and crowding out impact of government investment on private investment. The result of the analyzed data illustrated that private investment and government productive investment had positive but insignificant impact on economic growth; while government protective investment had negative as well as insignificant impact on economic growth within the period under study. In addition, the study illustrated that government investment on administration, economic, social and community services crowded in private domestic investment but only investment on economic services was statistically significant for the period under study. Based on the results, the following recommendations were made: That government should improve on its budget implementation, rationalization and give more priority to expenditures on economic and social services that make up for private investment, rather than expenditures on national assembly expenses as well as transfers that replaces private investment. In addition, deposit money banks should be encouraged to provide more long-term loans to the real sector of the economy.

Key words: Domestic investment; Private investment; Government investment; Crowding in; Crowding out; economic growth; Government expenditure

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INTRODUCTION

A lot of economies depend on investments to resolve several economic problems, crisis and challenges. Less developed countries in Africa such as Nigeria is introducing various economic policies that will attract as well as keep hold of private investors. This is due to the fact that investments in certain sectors of the economy can rapidly transform the numerous economic challenges we are facing as a nation. Therefore, the Nigerian government at any given opportunity works a lot to attract investments into various sectors of the economy. The motive for this is not farfetched. Investment both private and public comes with a lot of benefits such as job creation, increase in per-capita income, reduction in the level of poverty, increase in standard of living, increase in GDP, etc..

A number of studies have illustrated that there exist a correlation between private investment and public investment. Everhart and Sumlinski (2011), Odedokun (1997), are amongst scholars who have investigated this statement with different results. In less developed countries, government plays a vital function in capital formation. Specifically, public investment makes up a significant part of total investment. Therefore, it is worthwhile to assess the influence of these expenditures on private investment decisions. The effect of public

investment on private investment is indefinite. That is to say, public investment can work as a substitute (negative impact on private investment) to or a complement (positive impact on private investment) for private investment. The level of the impact depends on the sector in which the government carries out the investment projects. Public investment may promote private investment when it assists in increasing the productivity of private-owned firms. Conversely, it may crowd out private investment when: The government invests in ineffective state owned companies; private investors anticipate higher taxes to pay for such expenditures; the public sector competes with the private sector for internal loanable funds (Apergis, 2000). The objectives of this study includes: to examine the impact of private and public investment on economic growth and to analyze the trends of private investment, public investment and economic growth in Nigeria from 1970 - 2013. In spite of various structural changes and reforms in Nigeria, the country remains entangled with a number of economic maladies, which so far has proven to be overwhelming. Among these difficulties are high unemployment and poverty levels. The planned withdrawal of the government from the investment scene, and leaving it to the private sector to play its function has not been too promising for the nation. Nigeria's macroeconomic indicators show the pitiable performance of private investment in Nigeria for the period 1986 to date (CBN, 2010). For example, private investment declined from 12.3% of GDP in 1991 to 8.3% of GDP in 1992, this may be partly due to the reduced public investment, which fell during the same period. Private investment then increased to 12.5% in 1993 and to 16% in 1994. Later, it fell continuously to 8.9% in 1996. Between 2001 and 2005, the ratio averaged 13%; it peaked at 16.2% in 2002 but fell again to 12% in 2005 (CBN, 2010). Ever since, there have been insignificant increases in the ratio. The noticeable fall in the ratio of private sector investment to GDP in spite of the emphasis on private sector following the introduction of public sector reforms is even more perturbing. It is due to this, we seek to find answers to the following questions: Has the increase in government capital expenditure led to an increase economic growth in Nigeria? Has increase in private domestic investment increased economic growth in Nigeria? Which particular component of government capital expenditure spurs private investment in Nigeria? It is in answering these questions that necessitated this study.

1. LITERATURE REVIEW

We reviewed several literatures under the following sub-headings namely:

i) Public Investment and Economic Growth
ii) Private Investment and Economic Growth
iii) Crowding In and Crowding Out of Private and Public Investment

1.1 Public Investment and Economic Growth

Several studies have examined the effect of public investment on economic growth. Musgrave and Musgrave (1976) gave the basis of government intervention in the economy for sustainable economic growth and development. They argued that the market mechanism alone cannot carry out economic functions. Public policy is required to direct, guide and complement it. They listed factors that require government participation in the economy to include: the inadequacies of competitive market to bring about increased employment, price stability, and sufficient economic growth. Others include, Inter-temporal equity, which accounts for the importance of consumption of future generations against the desires of the present generation, and the absence of perfect competition in the real world. It is obvious that what is obtainable in the real world situation is imperfect competition and the existence of externalities.

Apostolo and Crumbley (1998) were of the opinion that fairness in national income distribution is a vital role provided by the government due to its spending on goods and services. This sums up the distributional role of government in economic development. Other roles of government are the allocation and stabilization roles. Also, these roles show the significance of government in economic development.

Easterly and Rebelo (1993) stressed the significance of government policy on economic growth. They emphasized on the structure and composition of government expenditure rather than its level and in that regard believed that the government expenditure on productive activities has an effect on economic growth whereas, government expenditure on unproductive activities has no effect on economic growth. However, the problem is to recognize which government expenditure is unproductive before it is spent. This means that government expenditure as well as the structure and composition of government expenditures are key determinants of economic growth.

Devarajan et al. (1996) disputed this finding. He differentiated the types of government expenditure, both by economic classification and by sector. The expenditure data were gotten from the IMF statistics, which categorizes expenditure based on: economic classification (capital, current); and functional classification (e.g. defense, administration, transport, health, education). In addition, Devarajan et al. expressed each group of expenditure as a part of the entire budget, rather than the complete amount, therefore taking into consideration the constraint of public budget (each group of expenditure can be improved on only at the cost of others). On the contrary Easterly and Rebelo (1993) discovered that public capital expenditure had an inverse, as well as statistically significant, effect on economic growth, transport and communication. In terms of categorization, Gbosi (2005) categorized government expenditure into productive and protective expenditure; the productive expenditure is

made up of government spending on economic, social and community services, whereas the protective expenditure is made up of government expenditure on administration and transfers.

Nasiru (2012) examined the relationship between government expenditure (both capital and recurrent) and economic growth in Nigeria from 1961-2010. His results indicate that there is no long-run relationship between government expenditure and economic growth in Nigeria when real GDP is used only as the dependent variable. Also, the causality results show that government capital expenditure granger causes economic growth. While no causal relationship was observed between government recurrent expenditure and economic growth. Thus, the implication for policy of this result is that any decrease in capital expenditure would have negative effects on economic growth in Nigeria.

Nenbee and Medee (2011) employed the arcane approach of vector auto regression and error correction model and discovered that the response of GDP to standard improvements in federal government expenditure (FGE) in Nigeria is negative in the short-run. This means that FGE has no effect on GDP in the long-run. Taiwo and Abayomi (2011) empirically investigated the trends and impact of government spending on growth rates of real GDP in Nigeria from 1970-2008 using the Ordinary Least Square (OLS) technique. The results illustrated that there is a direct relationship between real GDP, recurrent and capital expenditure of government. They suggested that government should encourage efficient distribution of development resources by stressing on private sector participation as well as commercialization privatization.

1.2 Private Investment and Economic Growth

The literature is filled with proof that private investment in most developing countries is positively related to growth than public investment (Akpokodje, 1998; Serven & Salimano, 1992a; Mamatzakis, 2001; Rashid, 2005). Delong and Summers (1990), in their study found out that the rate of private capital formation influences the rate of a nation's economic growth. Thus, it is now widely acknowledged that the expansion of private investment should be the added incentive for economic growth in developing economies.

Orji (2012) examined the effect of bank savings and bank credits on Nigeria's economic growth from 1970-2006. He adopted two models: Distributed Lag-Error Correction Model (DL-ECM) and Distributed Model. The result showed that a direct relationship exists between the lagged values of total private savings, private sector credit, public sector credit, and economic growth. Thus, he recommended among others, that government's effort should be directed towards increasing income per capita by decreasing the rate of unemployment in the country in an attempt to accelerate growth through improved savings and private investment.

Damulira (2010) examined a sample of 15 countries in sub-Saharan Africa during the period 1980-2008. Three estimation techniques namely random effects, fixed effects and bond dynamic panel estimation were used to test for the influence of private domestic investment on economic growth, and to test for consistency and robustness to different estimation methods. The empirical proof for sub-Saharan Africa implies that economic growth is strengthened by stable economic environment influenced either directly or indirectly by sound macroeconomic policies. Actually, the proof reveals that real GDP growth per capital is directly influenced by economic policies that increase the rate of private domestic investment, public investment, encourage growth in labor force through development of human capital, accelerate the volume of exports and provides credits for investment in the private sector. Therefore, to improve the region's growth performance, nations ought to look for ways to increase the rate of private investment.

Ghazali (2010) identified the causal relationship between private domestic investment and economic growth (GDP) in Pakistan over the period 1981 to 2008. He discovered the following: That there is a bi-directional causality between private domestic investment and economic growth; increased economic growth encourages large private domestic investment, and vice versa. The co-integration results from his study show that there is a long run relationship between private domestic investment and economic growth. From the result, it is obvious that private domestic investment in Pakistan spurs economic growth.

Tan and Tang (2011) investigated the dynamic relationship between private domestic investment (PDI), the user cost of capital and economic growth in Malaysia over the period of 1970 to 2009. His result shows that PDI, the user cost of capital, and economic growth are co-integrated in Malaysia. The Granger causality test shows that there is a unidirectional causality running from PDI to economic growth and from PDI to the user cost of capital in the long run.

Several economists have argued that when researching on investment in less developed countries, particular features not taken into consideration in the traditional theories of investment should be considered. Agénor and Montiel (1996) identified six of those factors. First, financial variables might have an impact on domestic investment due to underdeveloped financial systems and financial repression. Second, rationing of foreign exchange as well as the rate of exchange in the free market might have an impact on investment decisions due to the significance of imported capital goods. Third, as a result of their significance in the process of production in less developed countries, imported intermediate goods ought to be considered in relative prices of measurement. Fourth, debt overhang impedes investment due to the possibility of higher taxes to pay for future debt service.

Fifth, public investment has played a significant role in the process of capital formation in less developed countries. The impact maybe positive or negative based on the type of investment: which might be complementary or substitute for private investment. Sixth, macroeconomic instability and its resultant uncertainty, which have typified less developed countries, might have a significant impact on private investment.

1.3 Crowding In and Crowding Out

Despite the factors listed above, private investment would thrive in an encouraging environment of cost reductions in power, transport, and communications, which are frequently made available through public investment. Subsequent to a lively debate in the late 1950's and early 1960's about the advantages of John Kenneth Galbraith's theory of Social Balance (The Affluent Society), the economics profession set aside (or forgot) Galbraith's warnings about the threat of ignoring public infrastructures. However, David Aschauer revived immense deal of concern in the effectiveness of public capital spending by illustrating that extra spending by the government for non- defense capital goods seemingly had a very huge direct impact on private investment, productivity and thus output.

Though economists were not amazed that public infrastructure spending ought to encourage private output growth, the extent of the impact discovered by Aschauer was surprising to most. Aschauer estimated that extra public capital spending would add to the output of private firms in excess of 1.5 times as would an equal dollar increase in the firms' own capital stock.

There were numerous other studies in response to Aschauer study. Several of these studies discovered the impact of public investment on economic growth to be lesser than Aschauer discovered them to be. Munnell (1990) utilized a different statistical method in measuring the productivity of government expenditure. Though Munnell (1990), like Aschauer, employed a production function method to assess the impact of government infrastructure spending, she tackled the issue by estimating her production functions from cross sectional state-by-state data.

Munnell (1990) utilized estimates of both gross state product and private inputs of capital to create estimates of public capital stocks for 48 countries over the 1970-1986 period. Then, she utilized the country-by-country data to estimate the production functions and concluded that: "The data appears overwhelming that public capital has a direct effect on investment, employment and private output". Munnell's estimation of the relative impact of public investment was lesser than the estimation made by Aschauer.

The categories of expenditure on government infrastructure appraised by Aschauer and Munnell, fall into the group of physical capital investment; although government also invests in its citizens. This latter category of investment generates human capital if it enhances job skills (both potential and actual productivity) of its people.

Bogunjoko (1998) assessed the private and public investment nexus, growth and policy reforms in Nigeria. He employed the VAR approach to accelerate as well as project inter-temporally, private investment response to its major shocks namely, domestic credit, public investment, as well as output shocks. The results of the VAR illustrates that government strategies that create sustainable growth of output, stable public investment and encourage the availability of domestic credit to the private sector will support investment in the long run and short run.

Ekpo (1995) examined the relationship between public and private investment in Nigeria. The research tried to find out the effect of different types of public expenditure on private investment. The research isolated expenditure on infrastructure (which is an expenditure on social service which does not compete with private sector investment) from expenditure on real sectors e.g. agriculture, manufacturing and construction, which competes with private investment. Social services crowd in private sector investment whereas expenditure on real activities such as agriculture, manufacturing and construction crowd out private sector investment. This implies that the private sector is in a good position for investment in agriculture, construction and manufacturing. Furthermore, the result showed that capital expenditure on agriculture directly affects investment whereas capital expenditure on education as well as health exerts direct influence on private investment.

Greene and Villannera (1991) performed an empirical research on 23 countries and discovered that public investment on infrastructures complements private investment. Though, it should be noted that there is a limit for domestic savings, in some cases, public investment would cause a critical restriction for private investment and would crowd out private investment. On the other hand, Hatano (2010), estimating an error correction model, confirms the crowding-in effect of public investment on private investment whereas Balassa (1988) in his research of 30 countries illustrated that there is an inverse relationship between private investment and public investment.

It is significant to note that in public spending, the success of the private sector relies on the stability and certainty of the public incentive framework, which encourages or crowds in private investment. Quality and useful government expenditure is important in improving the efficiency of the private sector, as the quality of public spending appears to determine the rate of growth.

2. METHOD OF STUDY

In this section, we described how we carried out our investigation. Therefore the section exposes the research

design, data required, data collection and sources, method of data analysis and our estimated model.

2.1 Research Design

To create a more specific relationship between private and public investment, as well as economic growth in the economy, an empirical study of the presumed reasoning becomes necessary. This study will employ the ordinary least Square (OLS) method in analyzing the relationship between the variables in the model.

2.2 Data Required and Sources of Data

The data used for this study were mainly secondary time series data. They include:

RGDP- Real Gross Domestic Product, 1970-2013

PDI- Private Domestic Investment, 1970-2013

PDE- Government Productive Capital Expenditure, 1970-2013

PRE- Government Protective Capital Expenditure, 1970-2013

ADM- Administrative component of government capital expenditure, 1970-2013

ECS- Economic services components of government capital expenditure, 1970-2013

SCS- Social and Community Services component of government capital expenditure, 1970-2013

TRA- Transfer component of government capital expenditure, 1970-2013.

The data used for this study, were sourced from the publications of Central Bank of Nigeria (CBN) - Statistical Bulletin and Annual Reports and Statement of accounts (Various Issues) and also from the National Bureau of Statistics (NBS)

2.3 Method of Data Analysis

The study employed the co integration and Error Correction Mechanism (ECM) techniques to estimate the models. Primarily, the choice of co-integration technique was employed to tackle the problem of spurious correlation often associated with non-stationary time series data and check if there is any long run relationship between the variables in the model. The idea of co-integration (Granger, 1986; Mill, 1990) creates the connection of steady state equilibrium. The theory of co-integration is essential to integrate short-run dynamics with long-run equilibrium (Adebiyi, 2002). The ECM was employed to determine the speed at which the dependent variables will return to equilibrium as a result of a change in the independent variables in both models.

2.4 Model Specification

The choice of the above variables for our model was drawn from our literature. Therefore, two models were created and tested. The first model follows the argument by Devarajan et al. (1996) whereas the second model follows the works of Ekpo (1995) with slight modifications, specifically; the study looks at the numerous inputs of the components of public and private investments.

In line with the above, the functional relationship between the variables are stated as

$$RGDP = f(PDI, PDE, PRE), \quad (1)$$

$$PDI = f(ADM, ECS, SCS, TRA). \quad (2)$$

Where all the variables are as earlier defined.

From Equations (1) and (2), the econometric model is formed as:

$$RGDP_t = \alpha_0 + \alpha_1 PDI_t + \alpha_2 PDE_t + \alpha_3 PRE_t + \mu_{1t} \quad (3)$$

$$PDI_t = \beta_0 + \beta_1 ADM_t + \beta_2 ECS_t + \beta_3 SCS_t + \beta_4 TRA_t + \mu_{2t} \quad (4)$$

Where:

$RGDP_t$ = Real Gross Domestic Product at time "t"

PDI_t = Private Investment at time "t"

PDE_t = Public productive expenditure at time "t"

PRE_t = Public protective expenditure at time "t"

ADM_t = Administrative Expenses at time "t"

ECS_t = Economic Services Expenses at time "t"

SCS_t = Social and Community Services Expenses at time "t"

TRA_t = Transfer payments at time "t"

$\mu_{1t} = \mu_{2t}$ = Error term

$\alpha_1, \alpha_2, \alpha_3, \beta_1, \beta_2, \beta_3$, and β_4 are parameters estimates.

From the apriori expectation, α_1, α_2 and $\alpha_3 > 0$. In addition, $\beta_1, \beta_2, \beta_3$, and $\beta_4 > 0$

3. DATA ANALYSIS AND DISCUSSION OF FINDINGS

In this section, we analyzed our data and discussed our findings. The data were subjected to various econometric tests to understand the nature of the relationship between the variables under investigation. The results from the numerous econometric tests are presented below:

3.1 Static (Short- Run) Regression Analysis

Table 1
Short Run Regression for the GDP Model

Variable	Coefficient	*t*-value
C	2.834930	13.75701
Log(PDI)	0.618953	6.827532
Log(PDE)	0.138084	2.310583
Log(PRE)	0.213438	2.077998

Note. R^2= 0.986, Adjusted R^2= 0.985, *F*-statistics = 885.6, DW = 0.596, *t*-critical = 1.684
Source: E-views 7.1

Table 2
Short Run Regression for PDI Model

Variable	Coefficient	*t*-value
C	2.022736	3.372820
Log(ADM)	0.700824	3.913572
Log(ECS)	-0.201394	-1.255832
Log(SCS)	0.510709	2.363781
Log(TRA)	0.103961	1.866667

Note. R^2 = 0.956, Adjusted R^2 = 0.949, *F*-statistics = 135.9, DW = 1.19, *t*-critical= 1.684
Source: E-views 7.1.

We adopted the log-linear regression model for both models because the log-linear model satisfied the Akaike Information Criterion (AIC) and the Schwarz Criterion of computing models by having the lowest coefficient values for both criterions. The result of the analysis in Table 1 in particular showed that private domestic investment (PDI), government productive expenditure (PDE) and government protective expenditure (PRE) influenced economic growth considerably in the period under study. In spite of this high level of significance, high *F*-value and R^2 value of 885.6 and 96% respectively, an extremely low Durbin-Watson value of 0.96 characterized the model. This shows the evidence of positive serial autocorrelation, implying that the model cannot be used for policy formulation, thus, the need to carry out a long run analysis.

Alternatively, Table 2 shows that administration (ADM), social services (SCS) and transfers (TRA) appeared with their right signs and statistically significant. This implies that ADM, SCS and TRA crowd in private investment (PDI). Conversely, ECS crowded out private investment in the period under study, although it is not statistically significant. This means that government borrowing increased commercial interest rates and made loanable funds costly and unattractive to private investors. In particular, the model has a high computed *F*-value, and R^2 of 135.9 and 95% respectively. Also, the model has a low Durbin-Watson statistics of 1.19 implying the occurrence of positive autocorrelation. These observations point to the fact that the model cannot be used for policy formulation, therefore, we proceed to carry out a long run analysis.

3.2 Dynamic (Long-Run) Regression Result

Table 3
ADF Stationarity Test on GDP Model

Variable	Level/first difference	Calculated ADF	ADF critical at 5%	Remark
Log(GDP)	Level	-0.240749	-2.9378	NS
	First difference	-3.999332	-2.9399	S
Log(PDI)	Level	0.438695	-2.9378	NS
	First difference	-4.617556	-2.9399	S
Log(PDE)	Level	-1.705945	-2.9378	NS
	First difference	-3.799996	-2.9399	S
Log(PRE)	Level	-1.635235	-2.9378	NS
	First difference	-4.839884	-2.9399	S

Note. NS = non stationary while S= Stationary
Source: E-views 7.1.

Table 3 shows the Augmented Dickey Fuller (ADF) results of the Unit root test. The result shows that all the variables have unit roots and suggest that the variables are integrated in the order of two [I(2)], as confirmed by the test on the variables. That is, the autoregressive distributed lag (ADL) functions of the variables are of I(2) series. This is done to assess the possibility of co-integration on the data and to ensure consistency in subsequent stationary econometric modeling. The model above shows that all the variables were differenced at levels but proved to be non stationary, thus, they all had to be differenced at first difference, where they all became stationary. Having compared the stationarity of the variables above, we proceed to conduct the co-integration test.

Table 4
Co-Integration Test Result for GDP Model
Series: D(LOG(GDP),2) D(LOG(PDI),2) D(LOG(PDE),2) D(LOG(PRE),2)
Lags interval: 1 to 1

Eigen value	Likelihood ratio	5 percent critical value	1 percent critical value	Hypothesized No. of CE(s)
0.739957	139.7424	47.21	54.46	None **
0.624768	89.90680	29.68	35.65	At most 1 **
0.538950	53.63895	15.41	20.04	At most 2 **
0.491074	24.99171	3.76	6.65	At most 3 **

Source: E-views 7.1.

The table above shows that long run relationship exists between the variables. This is because it satisfies the requirement of at least one co-integrating variable apart from the dependent term.

Table 5
ADF Stationarity Test on PDI Model

Variable	Level/first difference	Calculated ADF	ADF critical at 5%	Remark
Log(PDI)	Level	1.001957	-2.9665	NS
	First Difference	-3.848559	-2.9705	S
Log(ADM)	Level	0.033788	-2.9665	NS
	First Difference	-4.816492	-2.9705	S
Log(ECS)	Level	-0.434131	-2.9665	NS
	First Difference	-3.571956	-2.9705	S
Log(SCS)	Level	0.072712	-2.9665	NS
	First Difference	-5.025334	-2.9705	S
Log(TRA)	Level	-1.992234	-2.9665	NS
	First Difference	-7.244039	-2.9705	S

Note. NS = non stationary while S= Stationary
Source: E-views 7.1.

The analysis above shows that all the variables became stationary at their receptive first difference. Thus, we proceed to carry out the co-integration analysis.

Table 6
Co-Integration Test Result for PDI Model
Series: D(LOG(PDI),2) D(LOG(ADM),2) D(LOG(ECS),2) D(LOG(SCS),2) D(LOG(TRA),2)
Lags Interval: 1 to 1

Eigen value	Likelihood ratio	5% critical value	1% critical value	Hypothesized No. of CE(s)
0.946544	154.3492	68.52	76.07	None **
0.803899	89.91353	47.21	54.46	At most 1 **
0.666507	54.07273	29.68	35.65	At most 2 **
0.529291	29.91377	15.41	20.04	At most 3 **
0.454582	13.33646	3.76	6.65	At most 4 **

Note. Source: E-views 7.1.

A look at the table above shows that long run relationship exists between the variables. This is because it satisfies the requirement of at least one co-integrating variable apart from the dependent term.

In order to confirm the existence of a co-integration among the time series variables employed in this study, we proceeded to estimate the error correction model (ECM).

Table 7
Parsimonious Error Correction Model for GDP Model
Dependent Variable: D(LOG(GDP),2)
Method: Least Squares
Sample (Adjusted): 1972 2013
Included Observation: 42 After Adjusting Endpoints

Variable	Coefficient	*t*-stat
C	-0.004879	-0.128572
D(LOG(PDI),2)	0.019898	0.086639
D(LOG(PDE),2)	0.004892	0.087336
D(LOG(PRE),2)	-0.028645	-0.521902
U(-1)	-0.322731	-2.385689

Note. Adjusted R^2 =0.089, DW stat = 2.63, *F*-Stat = 1.89, *t* - critical = 1.68.

Table 7 shows the parsimonious Error Correction Model for the GDP model. From the table above, Private Domestic Investment (PDI) positively influences economic growth, but it is not statistically significant for the period under study, and this theoretically does not conform to apriori expectation. Thus, we accept the null hypothesis, which says there is no significant relationship between PDI and Nigeria's economic growth for the period 1970 to 2013. The inability of private domestic investment (PDI) to have an impact on GDP agrees with studies carried out by Nteegha (2012) and Fadare (2010). In his work, Nteegha (2012) was of the opinion that bank lending to the real sector of the economy (our proxy for private domestic investment) had not led to real growth in the economy. This is obvious because huge part of bank's loans and funds are given to petroleum marketers and distributor to make quick profits. Also, he opined that one of the things that led to distress in eight banks which were judged to be in severe condition in 2010, was because the banks were involved in margin trading. This includes the trading of their shares in the stock exchange rather than lending considerably to the real sector of the economy. Therefore, bank loans were diverted for other uses. Fadare (2010) asserted that the problem is because bank credits were not channeled to productive activities and lending to the government is crowding out the private sector.

Also, Table 7 shows that the coefficient of government productive capital expenditure (PDE) appears with the right sign but does not significantly affect GDP. This signifies that if the government manages her expenditure correctly on socio-economic services and community services, it might have a major effect on economic growth. Conversely, government protective capital expenditure is negatively signed and is not statistically significant. This means that government expenditure on administration and transfers does not have any impact on economic growth in the period under study. This corresponds with a study by Akpan (2005), who employed a disaggregated approach in order to find out the parts of government expenditure that improves economic growth in Nigeria. He concluded that there was no significant relationship between most parts of government expenditure and economic growth in Nigeria. The failure of PDE and PRE to significantly impact GDP can be attributed to the poor management and unstable macroeconomic environment in the country. This confirms with a study by Cookey (2011) that official corruption and fiscal irresponsibility by government officials have consumed what could have been the economic dividends of government expenditure. Also, this corroborates with the study carried out by Okwu et al (2012), Nsiru (2012) and Nenbee and Medee (2011) that government expenditure has not positively and significantly influenced economic growth in Nigeria.

The adjusted R^2 is 0.089, implies that about 9 percent of the total variations in the dependent variable is explained by the explanatory variables in the model above while the remaining 91 percent is caused by variables exogenous to the model but covered by the error term. The Durbin-Watson statistics is 2.63, thus, we concluded that there is lesser degree of autocorrelation. This implies that we could employ the findings for policy formulation and implementation.

One significant observation of table 4.7 is that the ECM coefficient is rightly signed and highly significant, implying that the disequilibrium in GDP is offset by short run regression in each year.

Table 8
Parsimonious Error Correction Model for PDI Model
Dependent Variable: D(LOG(PDI),2)
Method: Least Squares
Sample(Adjusted): 1974 2013
Included Observations: 39
Excluded Observations: 3 After Adjusting Endpoints

Variable	Coefficient	*t*-stat
C	-0.009975	-0.286481
D(LOG(ADM),2)	0.020284	0.458319
D(LOG(ECS),2)	0.119890	2.799133
D(LOG(SCS),2)	0.010339	0.257423
D(LOG(TRA),2)	-0.011462	-0.625023
U(-1)	-0.184944	-1.708197

Note. Adjusted R^2 = 0.304, *F*-Stat = 3.18, DW = 2.25, Critical *T* = 1.684.
Source: E-views 7.1.

Table 8 shows the parsimonious error correction model. The table shows that the administration (ADM), economic services (ECS), social, and community service (SCS) parts of government capital expenditure crowded in private investment in Nigeria under the period of study. Nonetheless, only economic service (ECS) seems significant at the 5% level. Administration (ADM) is not significant for obvious reasons. Domestic security has proved to be a key test for the government to deal with, and when an environment is not considered safe, investors are likely to look elsewhere to invest their funds. Also, this result is consistent with the research by Olayide and Ikpi (2010). In their study, they discovered that capital expenditure on administration (ADM) crowd in private investment, this is because investment on security and defense offers political stability that is needed for economic growth, and therefore reducing such expenditure could be counterproductive. Certainly, if individual wealth is not guarded there will be serious risk in private investment. Also, government capital expenditure on social and community services (SCS), crowded in private investment in Nigeria for the period under study, but it is statistically insignificant. This result on social and community service (SCS) might not be totally surprising. Over the years, government expenditure on education and health has not met the required level set by international organizations like UNICEF. For instance UNICEF suggested that 26% of the national budget should be spent on education. Thus, in the educational sector low remuneration for teachers and lecturers, incessant strikes and brain drain are factors that may have led to this result.

Conversely, expenditure on transfers, not only showed to be statistically insignificant, but also crowded out private investment in the period under study.

Also, the model also shows that the independent variables explain 30% of the variation in the dependent variable, private investment. Thus, the remaining 70% is explained by factors, which are exogenous to the model but captured by the error term. The Durbin-Watson statistics is close to 2, illustrating the near absence of autocorrelation. Also, the error correction model is rightly signed and significant at the 5% level of significance.

3.3 Summary of Findings

After analyzing the results, we discovered the following:

(a) Private domestic investment agrees with our apriori expectation by having a positive sign, but is not significant at the 5% level of significance. This shows that increased bank lending to the private sector (our proxy for private domestic investment), increased economic growth and vice-versa for the period under study.

(b) Increase in government productive capital expenditure positively affected economic growth but was statistically insignificant for the period under study.

(c) Our results shows that increase in government protective expenditure reduced economic growth for the period under study, but this was not statistically significant.

(d) The study found that government expenditure on administration, economic services, and social services crowded in private investment for the period under study. Though, only government expenditure on economic services proved significant at 5% level of significance. Conversely, government expenditure on transfers crowded out private investment in Nigeria for the period under study, though this was not significant. This result is not entirely surprising

CONCLUSION AND RECOMMENDATIONS

The paper examines the impact of private and public investment on economic growth in Nigeria from 1970 - 2013. The study employed the ADF-test to avoid unit root problems that are usually related with time series data; also, the Johansen co-integration test was carried out to see if there is a long run relationship between the dependent variables and independent variables. The result showed that there is a long run relationship between the variables in the model. From the analysis of the results, the study shows that Private Domestic Investment (PDI) and government productive expenditure PDE) influenced economic growth positively, but was not significant for the period under study; Government protective capital expenditure (PRE) did not significantly influence economic growth (GDP) in Nigeria and was negative for the period under study; economic services (ECS) which is a part of government capital expenditure crowded in private investment for the period under study and was significant under the 5% level; administration (ADM) and social community service which are parts of government capital expenditure component crowded in private investment but was not significant for the period under study. Based on the

results, the following recommendations were made: banks should be encouraged to provide more long-term loans to the real sector if their impact on the economy is to be felt; also, the government should urgently tackle the infrastructural challenges of the country concerning energy availability, power supply, and water supply; in addition, the government should set specific targets for the manufacturing sector in the implementation plan of vision 2020; the decadence in the education sector and the health sector should be paid immediate attention to improve the quality of human resource in the economy etc. However, these recommendations can be achieved through a holistic approach in tackling corruption which has been the rot in the Nigerian economy.

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