

# Capital Expenditures and Gross Fixed Capital Formation in Nigeria

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## Abstract

This paper explores the relationship between capital expenditures and gross fixed capital formation in Nigeria. The study made use of secondary data covering the period 1981 to 2011. A least square regression analysis was carried out on a time series data, and to avert the emergence of spurious results, unit root tests were conducted. Other econometric tools of co- integration, Vector Auto Regression technique as well as Granger causality tests were deployed to ascertain the order of co integration and the level of relationships existing between the dependent and independent variables. Findings of study reveal that while Capital Expenditures (CAPEX) maintained a negative significant relationship with Gross Fixed Capital Formation (GFCF) in Nigeria at both 1% and 5% Alpha levels; Imports and National Savings had a positive significant relationship with GFCF at both the short and long runs. It was equally observed that the lagged value of GFCF had no significant impact on GFCF in the preceding year. Outcome of study did not come as a surprise, seeing that a functional classification of Nigeria's expenditure profile for the period under review reveals that; outlays on capital expenditure accounted for only about 32% of total expenditures, while the remaining balance of 68 % went to recurrent expenditures. That is certainly not good enough for a nation that is aspiring to grow. No nation has ever treaded the path of growth with this burgeoning level of recurrent expenditures. This, calls for caution and a national rethink! This paper concludes that for sustainable gross fixed capital formation to be achieved, the federal government of Nigeria should cut down on her recurrent expenditure profile in favor of an increased CAPEX. Our macroeconomic projections should guide the overall level of expenditures. There is need for a policy shift from our present protective-sectors - dominance to productive- sectors –dominance. Again, efforts must be made to mobilize the desired level of gross national savings that could attract foreign direct investments. Lastly, government is also advised to work on her potentially exportable goods and services that are needed elsewhere in the larger world and to reduce the level of inflationary trends.

**Keywords:** Capital Formation; Capital expenditure; Economic growth; Economic development; Investment

## 1.0 Introduction

According to Wikipedia the free encyclopedia, capital expenditure or (CAPEX) is an expenditure profile that is set to create future benefits. It is incurred when a business spends money either to buy fixed assets or to add to the value of an existing fixed asset with a useful life extending beyond the taxable year. Included in capital expenditures are amounts spent on acquiring fixed, and in some cases, intangible assets, repairing an existing asset so as to improve its useful life and upgrading an existing asset if it results in a superior fixture. CAPEX are used by companies to acquire or upgrade physical assets such as equipment, property, or industrial buildings. In a situation where capital expenditure constitutes a major financial decision for a company, the expenditure must be formalized at an annual shareholders meeting or a special meeting of the Board of Directors. On the other hand, Gross fixed capital formation, is a macroeconomic concept used in official national accounts. Statistically; it measures the value of acquisitions of new or existing fixed assets by the business sector, governments and "pure" households (excluding their unincorporated enterprises) less disposals of fixed assets. GFCF is a component of the expenditure on gross domestic product (GDP), and thus shows something about how much of the new value added in the economy is invested rather than consumed. Thus, the essence of study is to ascertain the relationship between capital expenditures and gross fixed capital formation in Nigeria.

Overtime, the Nigerian nation has witnessed a tremendous increase in her revenue profile through oil exports. She has equally enjoyed cycles of oil boom with successive governments harnessing the resources of the nation to execute its budget (Anyafor, 1996). Ironically, there has been an increase too in her expenditure pattern overtime. Paradoxically, it does not appear as if the increase in capital expenditures has translated into increased capital formation and consequent economic growth and development(kanu, Ozurumba and IHEMEJE;2014). This

scenario is quite disturbing. It is far from being satisfactory and obviously point towards an ailing economy. It is against this back ground that this study will seek to analyze how much of the capital outlays were invested into the economy, the usage to which such funds were put and the level of gross fixed capital formation generated in the economy within the period under review.

Thus, the main objective of this study is to ascertain the impact of capital expenditures on gross fixed capital formation in Nigeria and the study is limited only to the federal government of Nigeria. The scope of investigation is delineated from 1981-2011, a period of 31 (Thirty one years).

## 2.0 Theoretical Foundation

Gross fixed capital formation (GFCF) is a macroeconomic concept used in official national accounts . It is called "gross" because the measure does not make any adjustments to deduct the consumption of fixed capital (depreciation of fixed assets) from the investment figures. GFCF is not a measure of total investment, because only the value of net additions to fixed assets is measured, and all kinds of financial assets are excluded, as well as stocks of inventories and other operating costs.

It is worth noting that fixed assets in national accounts have a broader coverage than fixed assets in business accounts. Fixed assets are produced assets that are used repeatedly or continuously in production processes for more than one year. The range of fixed assets included in statistical measurement is defined by the purpose in using them. A vehicle for example is a fixed asset, but vehicles are included in GFCF only if they are actually used in work activities, i.e. if they fall within the scope of "production". A car for personal use only is not normally included. The boundaries are not always easy to define however, since vehicles may be used both for personal purposes and for work purposes; a conventional rule is usually applied in that case.

Non-produced assets (e.g. land except the value of land improvements, subsoil assets, mineral reserves, natural resources such as water, primary forests) are excluded from the official measure of GFCF. Also ordinary repair work, purchases of durable household equipment (e.g. private cars and furniture) and animals reared for their meat are not part of GFCF.

It is sometimes difficult to draw an exact statistical boundary between GFCF and intermediate consumption, insofar as the expenditure concerns alterations to fixed assets owned. In some cases, this expenditure can refer to new fixed investment, in others only to operating costs relating to the maintenance or repair of fixed assets. GFCF time series data is often used to analyze the trends in investment activity over time, deflating or redeflating the series using a price index. But it is also used to obtain alternative measures of the fixed capital stock. This stock could be measured at surveyed "book value", but the problem there is that the book values are often a mixture of valuations such as historic cost, current replacement cost, current sale value and scrap value. In other words, there is no uniform valuation.

It has been acknowledged that the value of fixed assets is almost impossible to measure accurately, because of the difficulty of obtaining a standard valuation for all assets. By implication, it is also almost impossible to obtain a reliable measure of the aggregate rate of profit on physical capital invested, i.e. the rate of return. Arguably though, the data do provide an "indicator" of the trend over time; using mathematical models one can estimate that the true rate is most likely to lie within certain quantitative limits.

Statistical treatment of the trade in second-hand fixed assets varies among different countries. Increasingly an attempt is made in many countries to identify the trade in second-hand assets separately if it occurs on a quantitatively significant scale (for example, vehicles). In principle, if a fixed asset is bought during the year by one organization, and then resold to another organization during the same year, it should not be counted as investment twice over in that year; otherwise the true growth of the fixed capital stock would be overestimated. The expenditure on Gross Domestic Product of which GFCF is a component should include only newly produced fixed assets, not second-hand assets.

In the computation of GFCF, offensive weaponry and their means of delivery were excluded from capital formation, regardless of the length of their service life; reason being that military weaponry is used to destroy people and property, which is not value-adding production. One cannot discuss capital expenditures and gross fixed capital formation in isolation without making reference to investment outlays. "Investment" in its broader sense includes purchase of capital assets, be it physical property or financial assets, it behooves of us at this level to briefly elucidate on some basic types and theories of investments (Wikipedia)

According to Anyanwu( 2002) different types of investment abound in literature. This includes (1) Fixed investment (2) Inventory Investment and (3) Replacement Investment. While fixed investment refers to purchases by firms and governments of newly produced capital goods such as production machinery, newly built structures, office equipment etc, Inventory investment refers to stock of goods which have been produced by businesses and governments but are yet unsold. The third type of investment refers to investment made to

replace worn out capital goods resulting from their use in the production process. Another type of investment is investment in real estate and residential construction. Taken together these types constitute an economy's gross private domestic investment. A number of theories seeking to explain the investment behavior of business firms and governments exist in the literature. These include:

**Marginal Efficiency of Capital Hypothesis** This is a Keynesian concept; which stipulates the rate of discount which equates present value of net expected revenue from an investment of capital to its cost.

The Accelerator Theory of Investment suggests that as demand or income increases in an economy, so does the investments made by firms.

Tobin Q-Theory of Investment states that investment is made not until the market value of assets is equal to the replacement cost of assets. Furthermore, by adding a marginal adjustment cost function to the profit function the neoclassical theory becomes logically equivalent to the *Q*- theory.

## 2.1 Conceptual framework

Generally, public expenditure is classified into two categories, namely recurrent and capital expenditures. A cursory look at Nigeria's public expenditure profile indicates that greater percentage of government expenditure was on capital expenditures between 1970 and 1980. Within this period, the total capital expenditure outlays constituted about 57% of government's expenditure profile while the remaining balance of 43% went to recurrent expenditures. Meanwhile, the government retained revenue was N56, 617.90 million, while the expenditure was N60, 632.80 million, resulting in deficit financing of N4, 014.90 during the period. The period was remarkable in Nigeria's socio economic development, apart from the establishment of many public enterprises; it witnessed the nationalization of several privately-owned companies and the execution of second and third National Development plans between 1970- 1974 and 1975-1980 respectively (Obiechina:2010).

The period 1981- 1995 witnessed a dominance of recurrent expenditure over capital expenditure. Government spent a total of N579, 062.90 million on the former while N404, 419.4 million was spent on the later. This represents a ratio of 58.82% to recurrent expenditures and 41.12 % to capital expenditure. The period 1996 – 2001 marked yet another remarkable period in government expenditure profile. The period witnessed capital expenditures exceeding recurrent expenditures. The capital expenditure was N1, 529,072.10 million, while the recurrent expenditure was N1, 372,415.00 million. Though government expenditure exceeded revenue during the period by N47, 122.20 million, the increased capital expenditure was expected to impact positively on the level of infrastructural development.

However the above fit could not be sustained nor maintained by the government in the period 2006 to 2007. The recurrent expenditure rose from its previous period figure of N1372415.00 million to N10, 886048.90 million resulting in 693.2 % growth rate while the capital expenditure increased from N1, 529072.10 million to N5, 836,801.80 million during the same period indicating a 281.7% growth rate. The period 2008- 2011 witnessed yet another era of recurrent expenditure dominance over capital expenditure .The government spent a total of N10,669,225.34 million on the former, while N3,916,105.50 was spent on the latter.

In all; the growth rate of government expenditure profile (both recurrent and capital) and retained government revenue during the period 1970- 2011 depicted a high level of volatility. This volatility could be attributed to fluctuations in the major source of financing (Revenue), the expenditure as well as signs of manifest inconsistency in government program and policies. The oil dominance of the Nigeria's revenue at the detriment of other sectors has haunted its overall development; thus, provoking thoughts about the resource –curse hypothesis. However it may not be entirely adequate to anchor the challenges of our socio economic and infrastructural development to fluctuations or reduction in the government revenue. Relating the drop in government retained revenue as the major cause of decay in infrastructure may be a far cry to the challenges confronting socio economic and infrastructural development in Nigeria.(Obiechina:2010) .

Taking a hindsight view of our corruption index, transparency initiatives, and cost of governance may give a clue as to why we are where we are today in terms of infrastructural development , burgeoning recurrent expenditure profile, and a failed attempt at gross fixed capital formation in Nigeria !

A sectoral analysis of capital expenditure profile in Nigeria over the period (1981-2011) indicates that administration sector attracted a capital development fund allocation ranging from the lowest 3.1% in 1986 to the highest 39.2% in 2004. The economic services sector attracted a capital development fund allocation ranging from the lowest 5.9% in 1992 to the highest 67% in 2002. Capital development fund allocation to the social/ community welfare sector ranged between the lowest 2.6%) in 1997 and the highest 23.1% in 2003. Transfer

related capital expenditure attracted a fund allocation ranging from the lowest (Nil transfer) in 2002 to the highest 76.3% in 1986. The 31year simple average capital expenditure allocation over the period 1981 -2011 period are 18.98.% for the administration sector, 40.43% for the economic service sector,11.37 % for the social / community welfare sector and 29.22 % for transfers.( CBN statistical Bulletin ,2011)

Analysis of total expenditure profile for the period under review ( 1981- 2011), showed that outlays on recurrent expenditure accounted for about 68% of the total while the remaining balance of 32% went to capital expenditure. This is certainly not good enough for a nation that is aspiring to grow. For the period under review, administration sector and external debt service transfer attracted more than their fair share of public expenditure to the detriment of the economic and social / community welfare sectors. This implies that directly productive activities such as agriculture, industry and commerce, construction, transport and communication, education, health services and environmental development were relatively underfunded as compared to defense, internal security, general administration and external debt servicing.

At current price, Nigeria's GFCF was N18.2 billion in 1981. From 1982 to 1987 it declined until 1988 when it assumed an increasing trend. The GCFC was N40.1bn in 1990, N141.9bn in 1995, N331.1bn in 2000, N804.4billion in 2005 and N1546.5 billion in 2006. It came up to N2053 billion in 2008, and N4207.4 billion in 2011 (CBN, 2011) .The identified sources of financial capital formation in Nigeria are total national savings, public corporation, foreign investment and aids, Taxation and marketing boards. The ability of these sources has greatly influenced positively the growth of the economy. The GCFC as a percentage of GDP in Nigeria was 12% in 2011. (CBN statistical Bulletin (2011))

### 2.3 Empirical framework

Uremadu (2008) explored the possible determinants of capital formation in Nigeria for the period 1980- 2004. Empirical results showed a positive influence of cumulative foreign private investment (CFPI), Index of energy consumption (INDEXEC) and total banking system credit to the domestic economy (BSTCr), and a negative influence of gross national savings (GNS), domestic inflation rate (INFR), maximum lending rate(MLR),foreign exchange rate(EXCHR) and debt service ratio(DSR) on capital formation. It was discovered that foreign exchange rate leads to capital formation in Nigeria, followed by index of energy consumption and then debt service ratio. Akujuobi (2008) writing on the topic "Foreign Direct Investments and Capital Formation in Nigeria, posit that, FDI, is a significant positive contributor to the overall capital formation efforts in Nigeria. Donwa and Odia (2009), considered the impact of globalization on the gross fixed capital formation in Nigeria from 1980 to 2006.Using the ordinary least square, it was found that globalization proxied by trade openness was negatively and insignificantly related to gross fixed capital formation. In other words, globalization has not helped in assisting fixed capital formation. Foreign Direct Investment and Gross Domestic Product were positive and significant while exchange rate had a negative impact on GFCF. Interest rate had positive and insignificant relationship with GFCF.

Aiyedogbon (2011) explored the relationship between military expenditure and capital formation in Nigeria. Findings of the study revealed that military expenditure (Milex) and lending rate have negative impact on gross capital formation (GCF) in Nigeria in both the short- and long-run. The GDP is positively significant in the long run while it is positive and insignificant in the short run. Ezekwesili (2012) was of the opinion that Nigeria's poor capital formation comes from low education development of the people. She reiterated that, the resurgence of entrepreneurial spirit based on hard work and sound education are the panacea or critical factors to changing Nigeria. Orji and Mba (2012) studied the relationship between foreign private investment, capital formation and economic growth in Nigeria using a two-stage least squares (2SLS) method of estimation. The study finds that the long run impact of capital formation and foreign private investment on economic growth is larger than their short-run impact. The last is yet to be heard on the concept of gross fixed capital formation in Nigeria. The above studies only served as reference material for future and further works. .

### 3.0 Research Methodology

In order to realize the objective of this paper, an econometric diagnostic procedure is adopted to understand the impact of capital expenditure on gross fixed capital formation in Nigeria. The operationalized and analytical procedure is based on the following relationship model:

$$GFCF_t = F( CAPEX ,EXP , IMP , FDI , TNSV ,INFL ,GDP )$$

Where  $GFCF_t$  = Gross fixed capital formation in Nigeria in year, t;  $CAPEX_t$  = Capital expenditure profile of Nigeria in year, t;  $EXP_t$  = Total exports out of the country in year, t;  $IMP_t$  = Total imports into the country in year t

$FDI_t$  = Foreign direct investments into the country in year, t;  $TNSV_t$  = Total national savings in the country in year, t

$INFL_t$  = Inflationary trends in the country in year, t;  $GDP_t$  = Gross domestic product of Nigeria in year, t

t = Time and  $\epsilon$  = The error term assumed to be normally and independently distributed with zero mean and constant variance, which captures all other explanatory variables which influences gross fixed capital formation in a country but are not captured in the model

### 3.1 Model Specification

A functional model is specified for the time series data to determine the relationship between capital expenditures and gross fixed capital formation. Explicitly put, the model could be stated as:

$$Y_1 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + e.$$

Where  $Y_1$  = dependent variable and  $x_1, x_2, x_3, x_4, x_5, x_6$  and  $x_7$  = independent variable. Better still, the above model could be stated in the short run as follows:

$$GFCF_t = \beta_0 + \beta_1 CAPEX_t + \beta_2 EXP_t + \beta_3 IMP_t + \beta_4 FDI_t + \beta_5 TNSV_t + \beta_6 INFL_t + \beta_7 GDP_t + \epsilon \dots \text{Equation 3.1}$$

The long run effects are captured through the individual coefficients of the VAR variable which contains information about whether the past values of variables affect the current values of the variables under study. The size and statistical significance of the coefficient of the residual correction term measures the tendency of each variable to return to the equilibrium (Lutkepohl, 2005)

$$GFCF_t = \beta_0 + \beta_1 CAPEX_t + \beta_2 EXP_t + \beta_3 IMP_t + \beta_4 FDI_t + \beta_5 TNSV_t + \beta_6 INFL_t + \beta_7 GDP_t + \beta_8 GFCF_{(t-1)} +$$

$$\beta_9 GFCF_{(t-2)} + \epsilon \dots \dots \dots \text{Equation 3.2}$$

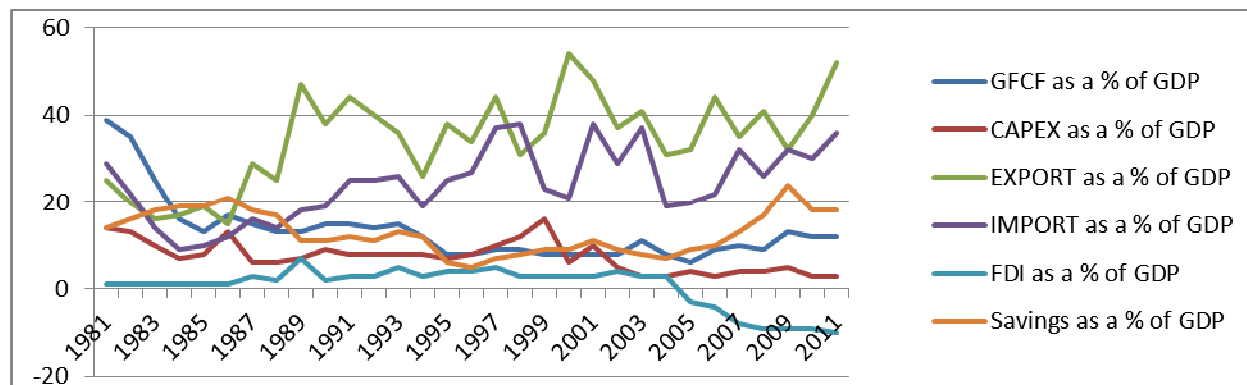
### 3.2. Estimation Procedure

This paper adopts techniques to test for presence of stationarity at level order using time series properties of the variables subjected to Phillips Peron Test statistic and performance co integration to examine long run convergences of the variable equations. VAR model for multivariate analysis of the identified variables(  $CAPEX$ ,  $EXP$ ,  $IMP$ ,  $FDI$ ,  $TNSV$ ,  $INFL$ ,  $GDP$ ) on GFCF is used to determine their relationship and also test the significance level of each variable on GFCF. The causal effects and significant relationship among,  $EXP$ ,  $IMP$ ,  $FDI$ ,  $TNSV$ ,  $INFL$ ,  $GDP$  and GFCF is determined by the Granger causality Test procedure( Chari, Kehoe and Mc Grattan, 2008; Johansen 1995; Granger and Jin-Lung Lin 1994).

### 4.0 Data Presentation and Analysis:

As a prime objective, this section focuses on the presentation and analysis of data for the study. Also, it aims to interpret the results obtained therein, so that policy implications can be drawn. Data for our estimation was generated from various publications of the Central Bank of Nigeria, for the period 1981-2011. These are aptly captured in the chart 1 below:

**Chart 1: Data for our estimation as a percentage of GDP**



Source: Data for the above chart were culled from the Central Bank of Nigeria's Statistical Bulletin (2011)

From the above chart, while exports have been contributing immensely to economic growth, the contributions of CAPEX and by extension Gross fixed capital formation has not been too impressive

#### 4.0 Data Estimation

##### 4.1 Phillips Perron Unit root test:

The unit root test is carried out using Phillips–Perron test to determine whether the data sets are stationary or not and the order of integration. From the output table below, we observed a mixed bag scenario. While some variables turned stationary at “first difference”; others did at “second difference”, meaning that the data sets are not spuriously related.

**Table1- Summary of Unit Root Test**

	T-Statistics.	CriticalValue@5%	Order of Integration	Sig.
<b>GFCF</b>	-7.11	-2.97	2 <sup>nd</sup> Diff	**
<b>CAPEX</b>	-6.40	-2.97	1 <sup>st</sup> Diff	**
<b>EXP</b>	-3.87	-2.97	1 <sup>st</sup> Diff	**
<b>IMP</b>	-10.34	-2.97	2 <sup>nd</sup> Diff	**
<b>FDI</b>	-9.74	-2.97	2 <sup>nd</sup> Diff	**
<b>TNSV</b>	-8.01	-2.97	2 <sup>nd</sup> Diff	**
<b>INFL</b>	-8.28	-2.97	1 <sup>st</sup> Diff	**
<b>GDP</b>	-14.99	-2.97	2 <sup>nd</sup> Diff	**

Source: E-view statistical package, version 7.0

##### 4.2 Test of Model Significance:

**Table 2: Summary of the global statistics using (Ordinary least Square (OLS) and Vector Autoregressive (VAR) models**

Test Statistics	Model 1 (OLS)	Model 2( VAR)
R-Square	0.992752	0.994197
Adjusted R-Square	0.990546	0.991448
S.E of Regression	113131.8	109949.9
Sum of Squared Residual	2.94E+11	2.30E+11
Log Likelihood	-400.0860	-371.6434
Durbin Watson Statistics	2.271896	1.724291
Mean Dependence Var.	713017.3	760971.4
SD Dependence Var.	1163555.	1188969.
Schwarz Criterion	26.69819	26.79172
F-Statistics( Computed)	450.0583	361.6927
F-Statistics( Tabulated)	2.42	2.34
Prob- (F-Statistics)	0.000000	0.000000

Source: E-view statistical package, version 7.0.

In order to confirm the specification status of our model, we employ the analysis of variance or ANOVA, for short.

**Decision rule:** In the short run, OLS model posted an R-Square of 99.27%, Adjusted R-Square 99.05%, Standard Error 113131.8, Log Likelihood- 400.08, Akaike information criterion 26.33 and Schwarz criterion of 26.70. In order to confirm the specification status of our model, we employ the analysis of variance or ANOVA, for short.

Since F-ratio calculated (450.05) is greater than F-ratio critical (3.50, 2.42), at both 1% and 5% Alpha levels. We conclude thus; that capital expenditures have a significant relationship with the level of gross fixed capital formation in Nigeria in the short run.

In the long run, the VAR model posted an R-Square of 99.4%, Adjusted R-Square 99.1%, Standard Error 109949.9, Log Likelihood-371.64, Akaike information criterion 26.32 and Schwarz criterion of 26.79

Applying the rule of ANOVA, since F-ratio calculated (450.05) is greater than F-ratio critical (3.50, 2.42), at both

1% and 5% Alpha levels, we confirm the specification status of our model and conclude that the dependent and independent variables are significantly related.

Having tested the significance of the model, we go a step further to test the significance of capital expenditures on gross fixed capital formation in Nigeria. This is achieved through the student t-test. We refer to the regression result in table 3 below:

### 4.3 Short run effects of capital expenditures and other variables on Gross fixed capital formation

From table 3 below, while Capital Expenditure (CAPEX) proved to have a negative significant relationship with Gross Fixed Capital Formation (GFCF) at both 1% and 5% levels of significance; Gross Domestic Product (GDP), Imports (IMP) and National Savings (NTSV) maintained a positive significant relationship with Gross Fixed Capital Formation in Nigeria. The resulting estimated model in the short run is given as:

$$GFCF = 37324.55 - 0.62CAPEX_t - 0.04EXP_t + 0.12FDI_t + 0.04 GDP_t + 0.17 IMP_t - 228.31INFL_t + 0.33NTSV_t \dots\dots\dots\text{Equation 1}$$

**Table 3: T-Statistics Table- CAPEX and other variables regressed against GFCF (In the Short Run)**

Variable	CAPEX	EXP	FDI	GDP	IMP	INFL	NTSV
Coefficient of the Variable	-0.620679	-0.046548	0.124193	0.047771	0.167104	-228.2885	0.327913
Standard Error	0.196984	0.031660	0.108844	0.015226	0.047238	1264.295	0.082483
T-Statistics Calculated	-3.150915	-1.470248	1.141014	3.137400	3.537530	-0.180566	3.975534
T-Statistics Tabulated@1%	2.08	2.08	2.08	2.08	2.08	2.08	2.08
T-Statistics Tabulated@5%	2.06	2.06	2.06	2.06	2.06	2.06	2.06
Significance	Negatively Significant	Not Significant	Not Significant	Positively Significant	Positively Significant	Not Significant	Positively Significant

Source: E-view statistical package, version 7.0.

The implication of the above result is that for any unit change in CAPEX, EXP, INFL, GDP accounts for 62%, 4.7% and 22820% respective decrease in GFCF. In the same vein, for any unit change in FDI, IMP, TNSV accounts for 4.7%, 16.7% and 32.7% increase in GFCF correspondingly in the short run.

### 4.4 Long run Effects of Capital Expenditures and Other Variables on Gross fixed Capital Formation

**Table 4: Johansen Co – Integration Tests.** The tests below strongly reject the null hypothesis of no co integration .i.e. no long run relationship between the dependent and the independent variables in favor of at least five (5) co-integrating vectors.

Trace test					Max Eigen value test				
Hypothesized No. of CEs	Eigen value	Trace Stats	0.05 Critical value	Prob**	Hypothesized No. of CEs	Eigen value	Max-Eigen Stats	0.05 Critical value	Prob**
None *	0.999808	803.3043	159.5297	0.0000	None *	0.999808	248.1245	52.36261	0.0001
At most 1 *	0.998546	555.1798	125.6154	0.0001	At most 1 *	0.998546	189.4730	46.23142	0.0000
At most 2 *	0.984443	365.7068	95.75366	0.0000	At most 2 *	0.984443	120.7350	40.07757	0.0000
At most 3 *	0.982670	244.9717	69.81889	0.0000	At most 3 *	0.982670	117.6044	33.87687	0.0000
At most 4 *	0.928552	127.3673	47.85613	0.0000	At most 4 *	0.928552	76.52489	27.58434	0.0000
At most 5 *	0.680893	50.84240	29.79707	0.0001	At most 5 *	0.680893	33.12464	21.13162	0.0007
At most 5 *	0.435147	17.71775	15.49471	0.0228	At most 6 *	0.435147	16.56451	14.26460	0.0213
Trace test indicates 5 co-integrating equations at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level					Max-eigenvalue test indicates 5co-integrating equations at the 0.05 level. * denotes rejection of the hypothesis at the 0.05 level				

Source: E-view statistical package- version7

Based on the above result, a vector autoregressive (VAR) is performed to estimate parameters of the model (Johansen 1995; Granger and Jin-lung lin 1994). The resulting estimated model in the long run is given as:

$$GFCF_t = 38361.42 - 0.57CAPEX_t + 0.03EXP_t + 0.26FDI_t + 0.03 GDP_t + 0.14 IMP_t - 230.36INFL_t + 0.55NTSV_t + 0.07 GFCF_{(t-1)} - 0.6 GFCF_{(t-2)} \dots \dots \dots \text{Equation..2}$$

The vector autoregressive model (Equation 2) extracted from table 5 below shows that previous year (t-1) gross fixed capital formation is not significant to current year GFCF growth rate as the probability of t- ratio calculated is less than t-ratio tabulated at both 1% and 5% Alpha levels.

**Table 5: T-Statistics Table- CAPEX and other variables regressed against GFCF (In the long run)**

	CAPEX	EXP	FDI	GDP	IMP	INFL	NTSV	GFCF <sub>(t-1)</sub>	GFCF <sub>(t-2)</sub>
Coefficient of the Variable	-0.574393	0.030319	0.262961	0.029523	0.140686	-230.3597	0.554165	0.068292	-0.604107
Standard Error	0.203920	0.045579	0.125669	0.016931	0.055314	1272.450	0.126747	0.194613	0.273986
T-Statistics Calculated	-2.816759	0.665207	2.092489	1.743706	2.543416	-0.181036	4.372205	0.350913	-2.204884
T-Statistics Tabulated@1%	2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82
T-Statistics Tabulated@5%	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07
Significance	Negatively Significant	Not Significant	Not Significant	Not Significant	Positively Significant	Not Significant	Positively Sig.	Not Significant	Negatively Significant

Source: E-view statistical package, version 7

From table 5 above, it could be said that while CAPEX maintained a significant negative relationship; National Savings, Total imports and foreign direct investments maintained a positive significant relationship with GFCF. It was equally observed that the lagged value of GFCF had no significant impact on GFCF in the preceding year. However this degenerated into a significant negative relationship in the second year.

#### 4.5 Casual Effects-

The causality effect of capital expenditures (and other variables under review) on gross fixed capital Formation as shown on Table 6 below reveals that, there exists a unidirectional relationship between Capital Expenditures, Gross Domestic Product and Gross fixed Capital Formation. Thus, it could be said that Capital expenditure and Gross Domestic Product granger causes Gross fixed Capital Formation. There also exists a bilateral causal relationship between Imports, National Savings and Gross Fixed Capital Formation.



**Table 6: Pair wise Granger Causality Tests**

Null Hypothesis:	Obs.	F-Statistic	Prob.
GFCF does not Granger Cause CAPEX	29	1.05647	0.3633
CAPEX does not Granger Cause GFCF		6.98622	0.0041
GFCF does not Granger Cause FDI	29	8.16223	0.0020
FDI does not Granger Cause GFCF		0.48664	0.6206
GFCF does not Granger Cause GDP	29	1.39133	0.2681
GDP does not Granger Cause GFCF		10.3159	0.0006
IMP does not Granger Cause GFCF	29	3.60641	0.0427
GFCF does not Granger Cause IMP		6.65398	0.0050
NTSV does not Granger Cause GFCF	29	19.8050	8.E-06
GFCF does not Granger Cause NTSV		20.2304	7.E-06

Source: E-view statistical package- version 7

#### 4.6 Application of Research Findings and Contribution to Knowledge

One of the major contributions of present study therefore is that it is possible from the model of equations 1 and .2 respectively, predict the result or level of gross fixed capital formation in Nigeria (At both the short and long runs), given that values of the other identified independent variables are known.

$$\text{GFCF} = 37324.55 - 0.62\text{CAPEX}_t - 0.04\text{EXP}_t + 0.12\text{FDI}_t + 0.04 \text{GDP}_t + 0.17 \text{IMP}_t - 228.31\text{INFL}_t + 0.33\text{NTSV}_t \quad \text{.....Equation1}$$

$$\text{GFCF} = 38361.42 - 0.57\text{CAPEX}_t + 0.03\text{EXP}_t + 0.26\text{FDI}_t + 0.03 \text{GDP}_t + 0.14 \text{IMP}_t - 230.36\text{INFL}_t + 0.55\text{NTSV}_t + 0.07 \text{GFCF}_{(t-1)} - 0.6 \text{GFCF}_{(t-2)} \quad \text{..... Equation.2}$$

#### 5.0. Findings, Conclusion and recommendations

It is pertinent at this juncture to briefly summarize the outcome of our research findings

- In the short run Capital Expenditure (CAPEX) proved to have a negative significant relationship with Gross Fixed Capital Formation (GFCF) at both 1% and 5% Alpha levels. While Gross Domestic Product, Imports, and National Savings maintained a positive significant relationship with Gross Fixed Capital Formation in Nigeria.
- In the long run, CAPEX maintained a significant negative relationship; while Total imports and National Savings equally maintained a positive significant relationship with GFCF.
- It was equally observed that the lagged value of GFCF had no significant impact on GFCF in the preceding year. However this degenerated into a significant negative relationship in the second year
- Result of the Granger causality test indicates that, there exists a unidirectional relationship between Capital Expenditures, Gross Domestic Product and Gross fixed Capital Formation. In other words, capital expenditure and Gross Domestic Product granger causes Gross fixed Capital Formation.
- There also exists a bilateral causal relationship between Imports, National Savings and Gross Fixed Capital Formation in Nigeria.
- The six variables can significantly predict 99.05% of short run variation in GFCF while in the long run, they predict to the level of 99.14 GFCF.

#### 5.2 Conclusions:

This study has made us to understand that capital expenditures have a negative significant relationship with Gross Fixed Capital Formation (GFCF) at both 1% and 5% Alpha levels. This did not come as a surprise; seeing that a 31 year simple average of capital expenditures for the period 1981- 2011 accounted for about 32% of Nigeria's total expenditure profile; while the remaining balance went to recurrent expenditures. No nation has ever treaded the path of growth and development with this burgeoning level of recurrent expenditures. It calls for caution and a national rethink!

### 5.3 Recommendations:

Based on the findings of study, we therefore recommend that the federal government of Nigeria should cut down on her recurrent expenditure profile. The present trend of **68: 32 %** allocations to recurrent and capital expenditures respectively **MUST** stop. That is not in any way acceptable! As a matter of fact; the reverse should be the case. Obviously, there is need for a policy shift from our present protective-sectors - dominance to productive- sectors –dominance Efforts must be made to mobilize the desired level of gross national savings that could be big enough to attract foreign direct investments .This is very vital as FDI will help to complement our domestic savings. Government should work on her potentially exportable products and services. We've got to look inwards, for the production of goods and services that are needed elsewhere in the larger world. In return; the proceeds should be utilized in the importation of needed technical tools and components. Again, our macroeconomic projections should guide the overall level of expenditure. As such, their projections need to be more realistic, internally consistent and based on more accurate and timely information. Lastly, efforts should be geared towards a reduction in inflationary trends. Policy formulators in Nigeria need to enact some investor friendly policies that will encourage promote and provide a conducive and enabling environment for gross fixed capital formation to thrive.

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