

CAPITAL FORMATION AND ECONOMIC GROWTH IN NIGERIA: AN ECONOMETRIC ANALYSIS

ABINA, Adedigba Praise

Economics Department
Ignatius Ajuru University of Education, Port Harcourt
E-mail: Praise2009@yahoo.com

And

MOGBEYITEREN Odunola Lovelynn Boluwatife

Emmanuel Alayande College of Education, Oyo
School of Education
Department of Curriculum and Instruction
E-mail: lovemode20022002@gmail.com

Abstract

The study investigates the relationship between capital formation and economic growth in Nigeria: An Econometric Analysis. Foreign direct investment, government expenditure, gross fixed capital formation and savings rate were used to proxy capital formation while the gross domestic product was used to measure economic growth. The data for the study was sourced from Central Bank of Nigeria statistical bulletin (2021). The study employed, phillip-perron test which was used to determine the stationarity of the variables, Johansen co integration test was employed to determine the order of integration while error correction model was employed to determine the speed of adjustment to equilibrium. The empirical findings suggest that foreign direct investment has a negative and significant relationship with gross domestic product, government expenditure has a positive but an insignificant relationship with gross domestic product, gross fixed capital formation has a negative and significant relationship with gross domestic product and finally, savings rate has a negative and insignificant relationship with gross domestic product in the long-run. The study therefore recommends that there is need for policies that will make a reasonable substantial portion of foreign investors' profit to be retained and re-deployed to other productive investment in the home country.

Key Words: *Capital Formation, Savings, Economic Growth, Investment, Foreign Direct Investment.*

Introduction

The value of capital a nation can source/generate determines her capacity to effectively utilise production factors available to her which in turn affects her capacity to increase production. Thus, substantial capital investment is needed for a nation that is determined to meet her development and growth objectives (Tareef & Shawaqfeh, 2019). The production capacity in this sense cut across virtually all sectors in the economy thus, an increase in a nation's physical capital stock and social economic infrastructure is equivalent to capital formation (Meyer, & Sanusi, 2019; Ugwuegbu & Uruakpa, 2013), which is further classified into gross private and public investment (Bakare, 2011). Capital formation is the amount of money saved to augment future consumption (Nweke, Odo & Anoke, 2017). The accumulation of capital goods, be it equipment, electricity, infrastructures, and tools by either an individual, the business sector or government officials (Oluwatobi, Festus & Grace, 2021). Capital and money markets represent a major source of capital formation for growth to take place in any nation. These markets are avenue for surplus investors to save their excesses and/or the deficit investors to borrow the excesses for investments, which in turn will lead to creation of employment opportunities and reduce poverty level.

The pace of development between countries most especially developing countries is widened as a result of differences in the structure of capital formation. Shuaib and Dania, (2015) asserted that capital formation helps in bridging and breaking the circle of poverty and reduce unemployment in developing countries, Jhingan, (2009) opined that capital formation is dependent on institutions that mobilizes savings in countries and how these institutions invest the mobilized funds. Thus, the failure of these institutions leads to low rate of capital formation in less developed countries (LDC). The classical economist describes capital formation as a gradual and continuous process which revolves around how a country save and invest. According to Nurskey, (1953) capital formation is a situation whereby countries do not spend all their current productive activities that generates revenue on the desires and need of current consumption but channel part of it to the production of goods, machines and heavy-duty equipment that will enhance the production capacity of the country. Arguably, expenditure on physical capital will enhance economic growth and development. On the other hand, Kuznet (1973) gave a more comprehensive view of capital formation as it involves public expenditure on both the physical and human capital. They opined that public expenditure on tangible goods such as high standard of education, recreational facility, scientific and traditional research will help boost the morale of citizenry. To this extent, investment in both human and physical capital can so greatly enhance growth in LDCs, Nigeria inclusive.

In Nigeria, there has been capacity underutilisation as a result of low capital formation (Edewusi, & Ajayi, 2019; Osundina & Osundina, 2014) as both domestic and foreign investment is declining on a daily basis as a result of the global pandemic and fall in Nigeria oil revenue (Ogunbiyi & Abina, 2019). Kanu, and Ozurumba (2014) discovered that the inadequate social infrastructure such as good road and steady power supply in Nigeria arose as a result of fluctuation in the countries capital formation. In a bid to improve the countries capital formation, the Structural Adjustment Programme (SAP) was initiated in the year 1986 with the sole aim of encouraging private domestic investment in the country, but poor implementation and corruption limited the program from achieving its objectives. Capital formation has generated significant debate in the past and recent year as it is an important factor that needs to be addressed for economic growth to take place, thus this research work thereby investigates capital formation and economic growth in Nigeria.

Literature Review

2.1 Conceptual Review

2.1.1 Factors that lead to low Capital Formation

Low Income: The savings of any country is dependent on how she generates her income. It was admitted by Jhingan (2009) that LDC consume more than half of their produce as a result of industrial backwardness which makes it difficult and virtually impossible for such country to save this thus makes capital formation low.

Obsolete Capital Equipment: Capital formation is low in LDC due to capital shortage, this has made it difficult for LDCs to acquire/replace existing capital equipment with new or updated one, making natural resource available to her either underutilized or unutilized. Non-availability of sufficient capital served as a major deterrent to increasing production and income of both resource owners and countries at large, this thus makes it difficult for savings and investment to be impossible.

Underdevelopment of Financial Institutions: For production to increase in any economy, there is need for more liquid capital therefore businesses tend to source for huge capital for expansion purpose from organized financial institutions. The rate of awareness and collateral requirement to secure loan facilities from financial institutions in the country is high compared with the interest charged on the loan facility. All these factors repel entrepreneurs and businesses to secure loan facility from organized financial institutions but they rather prefer to source for fund from un-organized institutions which contributes to financial exclusion in the country. Thus, financial institution underdevelopment is a major deterrent to capital formation in the country.

2.1.2 Capital Formation Determinants

For growth and development to take place in any economy; savings, interest rate, population growth, and foreign direct investment are key factors that determines her development and this need to be adequately addressed and given utmost importance.

Savings; Savings arises when a proportion of income is put aside for investment and future consumption which thus contributes to investment on capital asset and higher output level (Todaro & Smith, 2006) hence, savings increases as a result of income per capital (Bakare, 2011). High level of output arises as a result of large capital stock which is made available from savings, thus low level of savings arises as a result of low capital stock (Mankiw, Romer & Weil, 1992). The creation of savings, mobilisation of savings and investment of the mobilised savings all boils down to the interest that is to be charged from the mobilised funds and the profit that it's to acquire from the fund users.

Interest Rate; Interest charged on loan by financial institutions contributes immensely to capital formation in the country. High interest rate discourages investors which is a major obstacle to both private and public investment in a developing country, thus low interest encourages businessmen to source for additional fund from financial institution(s).

Population Growth; As population increases, the capital stock available for investment falls as a result of low-income level subsequently, the level of savings and investment declines alongside (Jhingan, 2009). In this sense, a rapidly growing population retards capital formation as people are compelled to use low-level technology in production processes which further retards capital formation.

2.1.3 Capital Formation and Economic Growth.

Traditional economists like Adam (1776) and modern economists like Harrod, (1946) etc., have considered capital formation as the most important factor that accelerate economic

growth. The importance of capital formation becomes more known with the help of the following factors:

1. Rapid Increase in Production Technique

Increase in production can be made by two methods. First, by expanding production techniques and by improving on the techniques acquired (stocks of instruments and machines), of which both require capital. It is therefore imperative to increase the rate of capital deepening and capital widening for large-scale production and economic growth to take place in any country.

2. Increase in Employment

Capital is required for an increase in employment, population in developing countries increase very fast. Thus, increase in production capacity needs an increase in capital formation. If there is no increase in capital formation, growing population will simply add up to the rate of unemployment.

3. Formation of Human Capital

Development or formation of human capital is possible only through capital formation. The expenditure incurred on health, education, social service and social welfare, is for the formation of human capital. By investing this capital in workers, their efficiency is increased.

4. Creation of Overhead Capital

Overhead capital has a great significance on nations economic growth. It includes roads, means of transport, canals, multipurpose projects, power-houses, etc. Without developing these overhead capitals economic growth will not be possible thus, capital formation increases overhead capital acquisition.

5. Economic Welfare

Increase in production, income and employment opportunity takes place by capital formation in developing countries. If the increased income is distributed equitably and properly, there will be an elevation in the economic welfare of the public. Others include; improvement in technological advancement, increase in per-capital income, market expansion, reduce inflation rate, reduce social and overhead cost and many more.

2.2 Theoretical Review

2.2.1 Harrod Domar Model

This theory was propounded by two economist Harrod, Roy (1939) and Harrod-Domar (1946), this theory postulate that investment has a dual characteristic, first it expands output supply (demand effect) and secondly, it increases income and capital stock (supply effect) this affect both the real income and output. The Harrod-Domar growth theory became attractive because of its capital-coefficient property (Roy, 1939). This theory describes the mechanism by which more savings leads to economic growth because savings leads to investment which eventually leads to capital formation. Thus, savings is most important factor for economy to grow and develop. The theory also suggests that if a developing country wants to achieve economic growth, the government in that country need to encourage savings. Thus, savings rate will increase economic output this implies that capital formation depends on the level of savings, which generates economic growth. On another note increasing savings result to increase in investment which eventually lead to economic growth only when the investment is complemented with technological advancement.

2.2.2 Theory of Financial Intermediation

Financial intermediation theory implies the mobilization of fund from surplus area (net savers) to the area of deficit for the purpose of investment (Abina & Lemea, 2019). Financial intermediation is the process by which savings are pulled together by depository institutions and lent out for productive use. Schumpeter (1911) stated that financial intermediaries render services like savings mobilization, project evaluation, risk management and transaction facilitation for economic development. Shaw, (1973) laid emphasis on the role of financial intermediation in boosting economic growth. They advocated that the success of financial intermediation is beneficial to all the parties involve; the deficit unit has a positive rate of return; the surplus unit is rewarded for taking risk while the financial intermediary is rewarded for a successful match. The banking system plays a crucial role as regards financial intermediation, they help in the allocation of savings and reduction in transactional cost which eventually improves productivity, technical change and the rate of economic growth (Schumpeter, 1912).

2.2.3 The Structural Hypothesis

This theory was propounded by Gerschenkron (1962) the theory emphasizes imperfections in banking systems and deficiencies on the demand side of financial services in the initial stages of economic development. According to Gerschenkron (1962) as the relative backwardness of the economy increases, the role of the banks in industrial capital formation declines alongside. European countries were categorized according to their degrees of historical backwardness, Britain came first on the list as the most developed country while Russia came last as the most backward and Germany midway in the classification. In a comparative developed economy like that of Britain, the role of banks in financing growth and development according to the believers of this view, was minimal because alternative sources of finance were available while in a moderately backward economy, the banks were expected to play a more prominent role as a source of capital for promoting industrialization. In the case of extremely backward or developing economies which Nigeria is inclusive, Gerschenkron argued that because of the fraudulent practices inherent in the economic structure of those nations, banks could not supply the capital necessary for industrialization.

2.3 Empirical Review

Oyinye, (2017) explored the relationship between capital formation and economic growth in Nigeria between the period 1984-2015. The study employed the granger causality test to determine the direction of causality, it was discovered that causality flow both ways, that is a bi-directional causality flow from gross fixed capital formation to gross domestic product (GDP), same direction of causality also flow from government capital expenditure to both gross domestic product and gross fixed capital formation. The study recommends that for that same direction of causality to be maintained, there is need to build a conducive business environment in the country and this can be achieved via a deliberate collective effort between the private sector and the government. In Karnataka, Belavi, (2017) used the VECM-Granger Causality/Block Exogeneity Wald Test to investigate the direction of causal relationship between human capital formation and economic development between the period 1991 to 2016. The empirical results of Granger causality analysis show that, one of the most important conclusions is the existence of unidirectional causality between education expenditure and economic growth, development expenditure and health expenditure in the short run while bidirectional causality between was identified between development expenditure and education expenditure. In Nigeria, the effect of capital formation on Nigeria economy was examined by Nweke, Odo and Anoke, (2017) the study made use of time series data between 1984-2015, using the vector error correction model (VECM) for estimation technique. From the VECM result it was discovered that in the long run capital expenditure

becomes harmful to the growth of Nigeria economy while capital formation was discovered to have not contributed positively to the growth of Nigeria economy. Gbenga and Adeleke (2013) examined the causal relationship that exist between savings, gross capital formation and economic growth between the period 1975-2008. The VAR causality test was employed as the statistical technique and it was discovered that national savings, gross domestic product and gross fixed capital formation all exhibit bi-directional causality, thus it was deduced that strong linkage exist amongs the three variables. The study thus recommends that there is need to mobilise grass root savings as this will spur up capital formation growth rate. Tareef, and Shawaqfeh (2019) explored several factors affecting capital formation in selected Arab Countries. The study focused on six Arabian countries; Bahrain, Egypt, Saudi Arabia, Jordan, Kuwait, and Morocco. Panel Data between the period 1978-2016 was sourced from World Bank and International Monetary Fund. The study made use of generalized least square method (GLSM) for statistical analysis. The result of the GLSM showed that capital stock increases as a result of government expenditure and as such, there is need to encourage and support government function in the aforementioned investigated Arabian countries. In South Africa, Meyer and Sanusi (2019) examined the causal relationship between employment, gross fixed capital formation and economic growth. Using quarterly time series data from 1995Q1 to 2016Q4, while the pairwise granger causality test for statistical analysis. The result of the causality analysis showed a one-way causality running from GDP to investment whereas a bi-directional causality was discovered between GDP and employment. The study thus suggests that as a measure to promote and accelerate growth favourable business environment as well low interest rate should be encouraged by the government through financial institution. In similar manner, Ajose and Oyedokun, (2018) examined the impact of capital formation on Nigeria economic growth for the period of 1980-2016. Granger causality test was employed as a statistical tool in the study, the causal relationship revealed that causality flows one way, from real gross domestic product to gross fixed capital formation but does not flow from gross fixed capital formation to real gross domestic product.

Methodology

3.1 Research Design

The paper used the ex-post- facto research design.

3.2 Nature and Source of Data

This study used secondary data from Central Bank of Nigeria statistical bulletin 2021. The data used for this study are basically time series data covering 1986 to 2020.

3.3 Method of Data Analysis

The estimation technique commences with a unit root test to confirm the stationarity state of the variables that entered the model. In order to test for the stationarity, the Philip-Perron test will be adopted. The first step is to test for stationarity at level, without constant and trend. If the variables are stationary after the first differencing, then the variables are integrated of order one i.e. 1(1). After that the co-integration regression will be obtained from the normalized coefficients of the model generated from the co-integrating vector. Based on this the Error Correction Mechanism (ECM) which determines the speed of adjustment to the equilibrium will be estimated.

3.4 Model Specification

Functional Linear Model

The functional linear form of the model is as follows:

$$\text{GDP} = F(\text{FDI}, \text{GOVE}, \text{GFCF}, \text{SAV}) \dots\dots\dots (1)$$

Transforming equation 1 into the econometric form gives:

Mathematical Linear Model

$$GDP = \beta_0 + \beta_1 FDI + \beta_2 GOVE + \beta_3 GFCF + \beta_4 SAV \dots\dots\dots (2)$$

Econometric Linear Model

$$GDP = \beta_0 + \beta_1 FDI + \beta_2 GOVE + \beta_3 GFCF + \beta_4 SAV + \mu_i \dots\dots\dots (3)$$

Apriori = $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0$.

Where

- GDP = Gross Domestic Product
- FDI = Foreign Direct Investment
- GOVE = Government Expenditure
- GFCF = Gross Fixed Capital Formation
- SAV = Savings Rate
- β_0 = Constant
- $\beta_1, \beta_2, \beta_3, \beta_4$ = explanatory variables coefficients
- μ_i = the error item for each estimation

Apriori Expectation

It is expected that foreign direct investment (FDI), government expenditure (GOVE), gross fixed capital formation (GFCF), savings rate (SAV) which represents the explanatory variables should have positive relationship with gross domestic product (GDP) the explained variable. This means a unit increase in any of the explanatory variables will lead to an increase in the explained variable. This can be expressed mathematical as; Apriori = $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0$.

• **Presentation and Analysis of Data**

4.1 Descriptive Statistics

Table 4.1. Descriptive Statistics

	GDP	FDI	GOVE	GFCF	SAV
Mean	0.523485	279234.5	471.2752	2871994.	7.315152
Median	0.530000	80749.00	351.2500	499681.5	4.800000
Maximum	0.670000	1360308.	1163.200	10571743	18.80000
Minimum	0.420000	602.0678	6.370000	11351.46	1.410000
Std. Dev.	0.059145	416690.3	399.5122	3991470.	5.370875
Skewness	0.209635	1.432406	0.394234	1.073509	0.799910
Kurtosis	2.985763	3.624069	1.774256	2.340163	2.078201
Jarque-Bera	0.241986	11.82033	2.920678	6.936973	4.687561
Probability	0.886040	0.002712	0.232158	0.031164	0.095964
Sum	17.27500	9214738.	15552.08	94775786	241.4000
Sum Sq. Dev.	0.111940	5.56E+12	5107521.	5.10E+14	923.0814
Observations	34	34	34	34	34

Source: Extract from E-view 10 Output.

The table 4.1 above shows the descriptive statistics on foreign direct investment (FDI), government expenditure (GOVE), gross fixed capital formation (GFCF), savings rate (SAV) and gross domestic product (GDP). The descriptive statistics output is presented under the following subheads: **Mean:** From the table, GFCF has the highest mean value of 2871994 percent followed by 279234.5 which is FDI. The third highest mean value is 471.2752 which represent GOVE while SAV has 7.315152 and the lowest mean value of 0.523485 represents GDP. **Median:** The median values best describe the central value of the data. 0.530000,

80749.00, 351.2500, 499681.5 and 4.800000 represents the central value of GDP, FDI, GOVE, GFCF and SAV respectively. The maximum and minimum values show the range for GDP which is (0.67000 to 0.42000,) FDI (1360308 to 602.0678), GOVE (1163.200 to 6.370000), GFCF (10571743 to 11351.46) and SAV (18.8000 to 1.41000). **Standard Deviation:** Shows the level of deviation of the employed variables GFCF, FDI and GOVE have the highest standard deviation of 3991470, 416690.3 and 399.5122 respectively. Which suggests that GFCF, FDI and GOVE are the most volatile variables. This is manifested in the extent of their dispersion from the mean. The GDP and SAV show a marginal and minimal deviation from its mean value. **Skewness:** Being a measure of symmetry, all variables are seen to be positively skewed which goes a long way to show that they possess rather incremental value as most evident in FDI, GFCF, SAV as they possessed skewness statistics of 1.432406, 1.073509 and 0.799910 respectively and the least positively skewed data is seen to be GOVE and GDP as they possess relatively low positive skewness of 0.394234 and 0.209635 respectively. **Kurtosis:** which is used to measure the “tailedness” shows, as it can be seen that high kurtosis of FDI and GDP shows the presence of outliers and the steepness inherent the variables while other variables have less prominent outliers and are flatter relatively showing lower growth rate. **Jarque-Bera:** This goes to show the asymptotic tendency of the employed variables and can be viewed via the probability level. In this light, it can be inferred that only FDI and GFCF is normally distributed as it possesses probability level less than 0.05 significant level.

4.2 Stationarity Test

The Phillips-Perron unit root test is used to determine the time series characteristics and properties of each variable. The choice of lag length was based on Akaike and Schwartz-Bayesian information criteria. The decision rule is to reject the null hypothesis if the PP statistic value exceeds the critical value at a chosen level of significance (in absolute term). The PP result is presented in table 4.2 below.

Table 4.2. Phillips-Perron (PP) tests for Stationary with Intercept and Linear Trend Unit Root Test Result.

Variables	T-Statistics	Probability	1%	5%	10%	I(D)
D(GDP)	-6.934180	0.0000	-3.661661	-2.960411	-2.619160	I(1)
D(FDI)	-5.488065	0.0001	-3.661661	-2.960411	-2.619160	I(1)
D(GOVE)	-10.08001	0.0000	-3.661661	-2.960411	-2.619160	I(1)
D(GFCF)	-5.349622	0.0001	-3.661661	-2.960411	-2.619160	I(1)
D(SAV)	-6.138466	0.0000	-3.661661	-2.960411	-2.619160	I(1)

Source: Extract from E-view 10 Output.

The results of table 1 above show that FDI GOVE GFCF SAV and GDP are stationary at first differencing at 1%, 5% and 10% significant level. The absolute PP test is (greater >) than all the corresponding Mackinnon’s critical values at 5% significance levels which are all at order one i.e. I(1). They are consequently ascertained as suitable for employment in further analysis without any significant spurious effects.

4.3 Multiple Regression: Ordinary Least Squares Result

Table 4.3

Dependent Variable: GDP				
Method: Least Squares				
Date: 09/04/21 Time: 15:16				
Sample: 1986 2020				
Included observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	-1.123110	0.331108	-3.391971	0.0000
GOVE	1.411205	4.393405	0.321210	0.7506
GFCF	-6.242109	3.260009	-1.914751	0.0661
SAV	-0.002438	0.002232	-1.092621	0.2839
C	0.583889	0.029887	19.53654	0.0000
R-squared	0.576383	Mean dependent var		0.523485
Adjusted R-squared	0.515867	S.D. dependent var		0.059145
S.E. of regression	0.041153	Akaike info criterion		-3.404316
Sum squared resid	0.047420	Schwarz criterion		-3.177573
Log likelihood	61.17122	Hannan-Quinn criter.		-3.328024
F-statistic	9.524369	Durbin-Watson stat		1.240805
Prob(F-statistic)	0.000054			

Source: Extract from E-view 10 Output.

From the result of the multiple regression analysis above, foreign direct investment has a negative but significant relationship (p-value of 0.0000) with gross domestic product, this means the study can accept the alternate hypothesis H_{A1} which states that there is a significant relationship between foreign direct investment and gross domestic product. A positive but insignificant relationship exist between government expenditure and gross domestic product, in this case we can accept the null hypothesis H_{02} which states that there exists no relationship between government expenditure and gross domestic product. A negative and insignificant relationship can be identified between gross fixed capital formation and gross domestic product, this means the study accepts the null hypothesis H_{03} which states that there is no significant relationship between gross fixed capital formation and gross domestic product. Finally, the null hypothesis H_{04} is also upheld in the case of savings rate and gross domestic product.

4.4 Johansen Cointegration Test

Table 4.4

Date: 09/04/21 Time: 16:04				
Sample (adjusted): 1988 2020				
Included observations: 32 after adjustments				
Trend assumption: Linear deterministic trend				
Series: GDP FDI GOVE GFCF SAV				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.901481	120.1254	69.81889	0.0000
At most 1 *	0.658982	48.28285	47.85613	0.0456
At most 2	0.311716	14.93244	29.79707	0.7844
At most 3	0.084249	3.352290	15.49471	0.9486
At most 4	0.019927	0.623967	3.841466	0.4296
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Extract from E-view 10 Output.

From the table above, the trace statistics is greater than the critical value at 5% in two scenarios, this means there are two (2) co-integrating equations in the model above, this also means there is a linear relationship among the variables. This implies that there is a robust long run equilibrium relationship between capital formation and economic growth in Nigeria. Consequently, we adopt the Error Correction Model which was specified in case, co-integration was established among the variables.

4.5 Error Correction Model Estimates

Table 4.5 Error Correction Model Estimates Result

Dependent Variable: GDP				
Method: Least Squares				
Date: 09/04/21 Time: 16:06				
Sample (adjusted): 1987 2020				
Included observations: 34 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	-1.081207	0.191208	-5.654612	0.0000
GOVE	1.903105	4.283105	0.444328	0.6611
GFCF	-6.294309	3.074309	-2.047391	0.0504
SAV	-0.001646	0.002208	-0.745471	0.4628
ECM(-1)	0.370532	0.185644	1.995928	0.0565
C	0.576459	0.030200	19.08792	0.0000
R-squared	0.654155	Mean dependent var		0.523906
Adjusted R-squared	0.587646	S.D. dependent var		0.060041
S.E. of regression	0.038555	Akaike info criterion		-3.506090
Sum squared resid	0.038649	Schwarz criterion		-3.231265
Log likelihood	62.09745	Hannan-Quinn criter.		-3.414993
F-statistic	9.835640	Durbin-Watson stat		1.643418
Prob(F-statistic)	0.000023			

Source: Extract from E-view 10 Output.

The value of the adjusted R^2 stood at 0.654155 and 0.587646 respectively implying that there exists goodness of fit in the model. This means that about 65.4% of the variation in economic growth is accounted for by variation in foreign direct investment, government expenditure, gross fixed capital formation and savings rate. The overall regression is significant at 5% level of significance implying that the joint effects of all the included variables were significant. The Durbin Watson statistic of 1.643418 shows evidence of first order serial autocorrelation in the model given that it is approximately less than 2.

Test of Hypotheses

Hypotheses 1

H₀₁: There is no significant relationship between foreign direct investment and gross domestic product.

H_{A1}: There is a significant relationship between foreign direct investment and gross domestic product.

Result Implication

Judging from the probability value, foreign direct investment has a p-value of 0.0000 which is less than 5% confidence level. Thus, we reject the null hypothesis and conclude that statistical significant relationship exists between foreign direct investment and gross domestic product in the long run as well as the short run.

Hypotheses 2

H₀₂: There exists no relationship between government expenditure and gross domestic product.

H_{A2}: There exists significant relationship between government expenditure and gross domestic product.

Result Implication

From the ECM result presented in table 5 above, government expenditure (GOVE) has a probability value of 0.6611, which implies that the alternate hypothesis will be rejected and the null hypothesis will be upheld. Thus, we can conclude that there exists no statistical significant relationship between government expenditure and gross domestic product in the long run and the same direction of relationship was identified in the short run.

Hypotheses 3

H₀₃: Significant relationship does not exist between gross fixed capital formation and gross domestic product.

H_{A3}: Significant relationship exists between gross fixed capital formation and gross domestic product.

Result Implication

Gross fixed capital formation has a probability value of 0.0504 which is approximately 5% confidence interval thus we reject the null hypothesis and accept the alternate hypothesis which states that statistical significant relationship exist between gross fixed capital formation and gross domestic product. It was also deduced from the result in table 4.3 that there is no statistical significant relationship between gross fixed capital formation and gross domestic product in the short run.

Hypotheses 4

H₀₄: Savings rate has no significant relationship with gross domestic product.

H_{A4}: Savings rate has a significant relationship with gross domestic product.

Result Implication

Savings rate is insignificant at 5% (Prob of t-stat =0.4628) level in the long-run. It is also insignificant at 5% in the short run, so we accept the null hypothesis and conclude that gross fixed capital formation does not enhance economic growth in the long run likewise in the short run.

4.6 Pairwise Granger Causality Tests

Table 4.6 Causality Tests

Pairwise Granger Causality Tests			
Date: 09/04/21 Time: 15:20			
Sample: 1987 2020			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
FDI does not Granger Cause GDP	32	1.43479	0.2564
GDP does not Granger Cause FDI		0.00208	0.9979
GOVE does not Granger Cause GDP	32	0.31090	0.7355
GDP does not Granger Cause GOVE		1.60055	0.2210
GFCF does not Granger Cause GDP	32	0.86855	0.4314
GDP does not Granger Cause GFCF		1.58914	0.2233
SAV does not Granger Cause GDP	32	0.54216	0.5879
GDP does not Granger Cause SAV		0.09563	0.9091
GOVE does not Granger Cause FDI	32	0.03628	0.9644
FDI does not Granger Cause GOVE		0.70614	0.5028
GFCF does not Granger Cause FDI	32	4.01275	0.0139
FDI does not Granger Cause GFCF		0.78464	0.5119
SAV does not Granger Cause FDI	32	0.23246	0.7942
FDI does not Granger Cause SAV		0.41446	0.6650
GFCF does not Granger Cause GOVE	32	1.04381	0.3664
GOVE does not Granger Cause GFCF		6.16221	0.0005
SAV does not Granger Cause GOVE	32	0.73910	0.4873
GOVE does not Granger Cause SAV		0.00173	0.9983
SAV does not Granger Cause GFCF	32	1.18907	0.3205
GFCF does not Granger Cause SAV		0.54015	0.5891

Source: Extract from E-view 10 Output.

Foreign direct investment (FDI) does not cause a change in gross domestic product (GDP), likewise GDP does not cause a change in FDI. This means past values of FDI cannot be used to predict future value of GDP, it also suggests that there is neither bi- nor uni-directional causality between FDI and GDP. GOVE does not cause a change in GDP neither does GDP cause a change in GOVE, GFCF does not cause a change in GDP, GDP also does not cause a change in GOVE, GFCF does not cause a change in GDP neither does GDP cause a change in GFCF the null hypothesis of no causal relationship between SAV and GDP neither does GDP cause a change in SAV, GOVE does not cause a change in FDI neither does FDI cause a change in GOVE. SAV does not granger cause FDI likewise FDI does not cause a change in SAV, past values of FDI does not cause a change in SAV. Uni-directional causality is

identified between GFCF and FDI, this means past values of GFCF can cause a change in FDI but past values of FDI can cause a change in GFCF. Uni-directional causality can be identified between GOVE and GFCF but cannot be identified between GFCF and GOVE. SAV does not cause a change in GOVE, GOVE does not cause a change in SAV this means past values of SAV cannot cause a change in GOVE likewise GOVE does not cause a change in SAV this means there is no reinforcement relationship between GOVE and SAV, SAV does not cause a change in GFCF likewise GFCF does not also cause a change in SAV, this means there is no re-enforcement relationship between GFCF and SAV.

• **Summary, Conclusion and Recommendation**

This study investigates capital formation and economic growth in Nigeria, time series data was generated from CBN bulletin from 1986-2020. The study made use of the Phillip-Perron (PP) unit roots test; result showed that the variables under study became stationary at level 1(1) one which necessitated the Johansen Cointegration test which was used to measure the linear relationship among the variables and from the result it was discovered that (2) cointegrating equations were noticeable in the model which implies that there is a robust long run equilibrium relationship in the model. Meanwhile, from the result of the ECM it was discovered that foreign direct investment (FDI) has a negative (co-efficient of -1.081207) and significant relationship (P-value 0.0000) with gross domestic product in the long run. This means for every one percent increase in FDI, it will lead to about -1.081207 reduction in GDP, this result contradicts our earlier anticipated expectation. The reduction is as a result of foreign companies deploying a huge portion of their income back to the home country which makes growth process in Nigeria slow. Secondly, government expenditure (GOVE) has a positive (co-efficient of 1.903105) but an insignificant relationship with gross domestic product at 5% (Prob of =0.6611) level in the long-run. This means for every one percent increase in GOVE it will lead to about 1.903105% in GDP, the study therefore accepts the apriori expectation earlier stated, this result agrees with the findings of Tareef, and Shawaqfeh (2019). The positive relationship is as a result of the various capital expenditure project that the government undertakes which increases the provision of social amenity, increase production of goods and services in the economy and invariably contributes to reduction in unemployment rate which on the long-run will eventually lead to growth while the insignificant relationship arises because of financial embezzlement and diversion of fund meant for infrastructural development. Gross fixed capital formation has a negative and significant relationship (p-value of 0.0504 which is less than 0.05%) with gross domestic product in the long run. The study therefore rejects the null hypothesis and conclude that gross fixed capital formation enhances economic growth. The study rejects the earlier anticipated apriori expectation since a reduction in GFCF will lead to about -6.294309% decrease in gross domestic product. The decline in capital formation can be as a result of macroeconomic imbalances such as deteriorating foreign exchange rate and corruption in public sector. The inadequacy in economic infrastructure such as poor power supply, bad road network as well as poor health facilities were equally responsible for the decline in capital formation over time, all these affect the overall speed and strength of economic growth in Nigeria have not been satisfactory. Savings rate has a negative (-0.001646) and insignificant (at 5% Prob of t-stat =0.4628) relationship with GDP in the long-run. This means for every one percent increase in savings rate it will lead to about -0.001646% reduction in GDP, this result is contrary to our apriori expectation, the negative result obtained arises as a result of unstable macro-economic environment in the country. Finally, the granger causality tests indicate that uni-directional causality exist between GFCF and FDI, this means past values of GFCF can be used to predict FDI but past value of FDI does

not cause a change in GFCF, the same uni-directional causality exist between GOVE and GFCF.

Recommendation

- Since foreign direct investment is not contributing positively to economic growth then there is need for policies that will make a reasonable substantial portion of foreign investors' profit to be retained and re-deployed to other productive investment in the home country.
- Government should increase public capital accumulation (public expenditure) and also eliminate all the factors militating against foreign private capital accumulation. This will in no small way boost output growth even in the face of financial sector inefficiency.
- The government should be creating an enabling atmosphere and provide more infrastructural facilities to pave way for investment which in turn will boost capital formation. Likewise, there should be conscious effort by both government and private sector to address the issue of corruption in the economy.

References

- Abina A. P., & Lemea G M (2019) Capital market and performance of Nigeria economy. *International Journal of Innovative Finance and Economics Research*, 7(2), 51-66.
- Adam, J.S. (1776). Towards an understanding of inequity. *Journal of Abnormal Psychology*, 1(67), 422-436.
- Ajose, K., & Oyedokun. G. E. (2018). Capital formation and economic growth in Nigeria. *Accounting & Taxation Review*, 2(2), 131-144.
- Bakare, A.S. (2011). A theoretical analysis of capital formation and growth in Nigeria. *Far East Journal of Psychology and Business*, 3(2), 11-24.
- Belavi, S.S. (2017). Human capital formation and economic development in Karnataka: An econometric analysis. *International Journal of Economics & Management Sciences*, 1(7), 1-7. doi: 10.4172/2162-6359.1000496.
- Central Bank of Nigeria (CBN). Annual Statistical Bulletins of 1990 - 2020. Central Bank of Nigeria Publication. Abuja.
- Edewusi, D. G., & Ajayi, I. E. (2019). The nexus between tax revenue and economic growth in Nigeria. *International Journal of Applied Economics, Finance and Accounting*, 4(2), 45-55.
- Harrod, D. E. (1946). "Capital Expansion, Rate of Growth, and Employment". *Econometrica* 14 (2), 137-147. doi:10.2307/1905364. JSTOR 1905364
- Gbenga, W.A., & Adeleke, O. (2013). Savings, gross capital formation and economic growth nexus in Nigeria (1975-2008). *Journal of Economics and Finance*. 2(1), 19-25.
- Gerschenkron, A. (1962). Economic backwardness in historical perspective. Cambridge, MA: Belknap Press of Harvard University Press.
- Granger, C.W.J. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica*. 3(37), 424-438.
- Hernandez-Cata, E. (2000). Raising growth and investment in Sub Saharan Africa: What can be done? Policy Discussion Paper: PDP/00/4, International Monetary Fund, Washington DC; 2000.
- Jhingan, M.L. (2009). The economic development and planning. 39th Edition. Vrinda Publication LTD.
- Kanu, S.I., & Ozurumba, B.A. (2014). Capital formation and economic growth in Nigeria. *Global Journal of Human-Social Science*, 4(14), 43-58.
- Kuznets, S. (1973). Modern economic growth: Rate, structure, and spread (2). New Haven, US: Yale University Press.
- Mankiw, N.G., Romer, D., & Weil, D. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics*, 2(107), 407- 437
- Meyer, D.F., & Sanusi, K.A. (2019). A causality analysis of the relationships between gross fixed capital formation, economic growth and employment in South Africa. *Studia Universitatis Babeş-Bolyai Oeconomica*. 1(64), 33-44. doi: 10.2478/subboec-2019-0003.
- Ogunbiyi, S.S., & Abina, P.A. (2019). The nexus between oil and non-oil revenue on economic development in Nigeria. *International Journal of Economics, Business and Management Studies*. 2(6), 355-365.
- Oluwatobi, A.A., Festus' F.A., & Grace, O.O. (2021). Tax revenue, capital formation, and economic growth in Nigeria. *Research in World Economy*. 1(12), 101-112.
- Osundina, K. C., & Osundina, J.A. (2014). Capital accumulation, savings and economic growth of a nation: evidence from Nigeria. *Global Journal of Interdisciplinary Social Science*. 3(3), 151-155.
- Onyinye, N.G., Idenyi, O.S., & Ifeyinwa, A.C. (2017). Effect of capital formation on economic growth in Nigeria. *Asian Journal of Economics, Business and Accounting*, 5(1), 1-16.

- Nurkse, R. (1953). *Problems of Capital Formation in Underdeveloped Countries*. New York: Oxford University Press.
- Harrod, R. F., (1939). An essay on dynamic theory. *Economic Journal*, 1(49), 14-33.
- Schumpeter, J. A. (1912). *Theorie der wirtschaftlichen, entwicklung*. Leipzig: Dunker and humblot, (The theory of economic development, translated by Redivers Opie. Cambridge, MA: Harvard University Press, 1934).
- Schumpeter, J.A. (1911). *The theory of economic development*. Cambridge, MA: Harvard University Press.
- Shaw, E. (1973). *Financial deepening in economic development*, Oxford University Press, New York.
- Shuaib, I. M., & Dania, E.N. (2015). Capital formation: Impact on the economic development of Nigeria 1960-2013. *European Journal of Business, Economics and Accountancy*, 3(3),23-41.
- Tareef, O.B., & Shawaqfeh, W. (2019). Capital formation in monetary growth models: An empirical study of selected Arab countries. *International Journal of Business and Economics Research*. 2(8), 50-57. doi: 10.11648/j.ijber.20190802.12.
- Todaro, M. P., & Smith, S. C. (2006). *Economic development* 8th edition. Manila, Philippines: Pearson South Asia Pte. Ltd.
- Nweke G. O., Odo S. I., & Anoke C. I. (2017). Effect of capital formation on economic growth in Nigeria. *Asian Journal of Economics, Business and Accounting* 5(1), 1-16.
- Ugwuegbe, S. U., & Uruakpa, P. C. (2013). The impact of capital formation on the growth of Nigerian economy. *Research Journal of Finance and Accounting*, 4(9), 36-40, ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online).