

Determinants of Capital Formation in Nigeria

Dickson Amoruwa MEJEBI¹, Sunday Nosa Ugbogbo^{1*} & Stanley Otakho Iyoha²

¹Department of Accounting, Faculty of Social and Management Sciences, Benson Idahosa University, Benin City, Edo State.

²Department of Accounting, Faculty of Management Sciences, University of Benin, Benin City, Edo State.

*Corresponding Author

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ABSTRACT

The study investigated the determinants of capital formation in Nigeria. For the purpose of analysis, the unit root test was done by using the Augmented Dickey Fuller methodology (ADF) and Philip Peron while f-bound test and ARDL models were used to determine the long and short-run relationship respectively. The time series data gathered for the four variables were from World Bank development indicator from 1981 to 2019. The results from the stationarity test showed that not all the variables were stationary at level so it enabled the use of f-Bound test (long Run) and Autoregressive Distributed Lag Model (short-run) to long-run analysis. The coefficient of GNI as a percentage of GDP implies that a unit change in GNI led to about increase in capital formation during the period under review. This therefore conforms to apriori expectation of a positive relationship between Gross national Income and capital formation in an economy. Also, the coefficient of GNS as a percentage of GDP implies that a unit change in GNS led to an increase in capital formation during the period under review. Therefore, this conforms to apriori expectation of a positive relationship between Gross national Savings and capital formation in an economy. The coefficient of FDI as a percentage of GDP implies that a unit change in FDI led to a decline in capital formation during the period under review. This therefore failed to conform to apriori expectation of a positive relationship between foreign direct investment and capital formation in an economy. Furthermore, the coefficient of export Earnings as a percentage of GDP implies that a unit change in export earnings led to a decline in capital formation during the period under review. This therefore failed to conform to apriori expectation of a positive relationship between Export Earnings and capital formation in an economy. Based on these findings, the study recommends amongst others that; there should be the encouragement of savings culture and creation of a conducive environment for investment to thrive. Also, the government should not only find means of attracting foreign investment but also ensure that these funds drive capital formation both in the short-run and long-run.

Keywords: Capital Formation, Export Earnings, Gross National Savings, Gross National Income, Foreign Direct Investment

INTRODUCTION

Over the past decades, one of the major objectives of every economy is to achieve a rapid economic growth and development that is able to reduce poverty, create employment opportunities and the entire promotion of the welfare of the citizen. Virtually, almost all development theories believe that this economic growth can be achieved through the accumulation of physical and human capital among other things (Okoli & Agwu, 2012). Capital formation therefore provide major impetus in the increase of production potential of the industrial and manufacturing sectors of the economy which in-turns brings about the balancing of the economy through multiplier effects in terms of the growths of other sectors of the economy that results in

technical progress (Pathania, 2013). Nevertheless, capital formation in the growth and development of the economy in terms of its ability to determine the economic productive capacity cannot be overemphasized. Therefore, factors that determine growth of capital formation should be given adequate attention (Anyike & Uzah, 2016). Capital formation can be addressed from a microeconomic perspective when an corporate organization is considered (Seth, 2021). By implication, the capital structure of such organization is examined so as to consider the factors that determine it. Hence, capital structure describes the proportionate relationship that exists between debt (liability) and equity (owners' fund or capital). From the corporate aspect, liability which includes debt majorly consists of the long-term loans which are debenture, paid up share capital, share premium, reserves; retain earnings and the likes (Owolabi & Inyang, 2012). When capital formation is analyzed as a macroeconomic element, it is regarded as a component of Gross Domestic Product (GDP) with the inclusion of consumption, net exports (export less imports) and services as an indicator of the level of investment in the economy. The concept therefore describes that an economy does not use the entirety of its present-time current production activity to meet the needs and immediate consumption desires of the people but it directs some part of the capital into the creation of capital goods (Jhingan, 2005).

In Nigeria for instance, the economy witnessed tremendous growth in the 1970s and early 1980s as a result of the oil boom. However, with the collapse of the oil market in 2020 as well as the consistent shortfalls in the national savings, export earnings and foreign direct investment it has thereby resulted into a consistent reduction in the formation of capital and hence, economic growth. For example, during the investment boom, the ratio of gross investment on gross domestic product was 16.8% and 31.4 percent in 1974 and 1976, respectively, before falling to 9.5 percent and 8.9 percent in 1984 and 1985. (Okafor, 2016). It was 25.4 percent of its Nominal GDP in 2019 in recent years. In 2019, the gross saving rate was 10.8%, which is low when compared to their foreign competitor's rate of almost 40 % (CEIC Data, 2021). To arrest this continued decline in capital accumulation, the government adopted series of economic restructuring programmes which with a view to providing a stable macroeconomic and investment environment. Although the spike in oil prices in the 1990s was anticipated to unleash an investment and private capital formation boom, this did not happen in Nigeria since the windfall flowed primarily to the government, with the regime's preference for how it was spent. The weak output growth rate during the period is no doubt explained in part by the drop in investment in the 1980s and the low investment ratio that remained into the 1990s. During that time, the average annual growth rate was 2.3 percent (1986-2000). Despite the fact that a large body of empirical work has shed light on many aspects of capital formation, numerous key concerns remain unsolved in regards to several key determinants that influence its accumulation and pace of change in Nigeria. The goal of this study is to correct this anomaly by looking into the impact of gross national savings, export earnings, foreign direct investment, and gross national income on private capital formation.

LITERATURE REVIEW

Concept of Capital Formation

Capital formation is a word used to characterize a country's net capital accumulation over a given accounting (Van Oordt, 2017). However, capital is described as the process that enhances the acquisition of additional capital stocks which are used in the production of goods and services in an entity (Seth, 2021). Bakare (2011) described capital formation as the ratio of income saved from the present stream of income that can be freely invested to provide for income and output in the future. It often stems from acquiring assets such as factory buildings, machineries, equipment and other capital goods need for production. Capital formation is important for achieving long term or short term economic growth, rapid or persistent growth. However, capital formation is the process of adding to the stock of real productivity (Black, 2003). Capital formation can be achieved through capital accumulation and can also be referred to as capital accumulation (Olamide, 2018). Capital accumulation is a process which involves saving, borrows

from accumulated savings for investment purposes.

Determinants of Capital Formation

There are several factors that determine capital formation, but this study considers the following.

Export Earnings

Export earning is one of the explanatory variables that are used in the study and it will also be regressed against the capital formation which is the dependent variable of the study. This is defined as the earnings of an economy that are generated through the export of goods and services to foreign economies of the world. The higher the volume of goods and services that are exported, the higher the level of export earnings, the better it is for the economy (Okafor, 2016).

The empirical relationship between fluctuations in export earnings and investment in Nigeria is still foggy. As a result, the findings of the study are expected to have profound implications for policy. For example, if export fluctuation were confirmed to retard capital formation in Nigeria, this would dramatize the desirability of accumulating foreign exchange reserves to smooth fluctuations in export earnings in the short run. These findings could also serve to bolster current efforts at trade and exchange rate liberalization as a mechanism for mitigating fluctuations in export earnings in the long run (Akpokodje, 2000).

Gross National Savings

Gross National Savings is defined as gross disposable income less final consumption expenditure after taking account of an adjustment for pension funds. It is the sum of private, public and foreign savings, which is the total amount of national income minus aggregate consumption and is indicative of funds available for domestic and foreign direct investment. Savings is therefore the inverse of consumption and so depends on changes in household, government and private consumption (Nikoloski, Miceski & Paceskoski, 2015). Gross National Savings consists of the savings of household sector, private corporate sector and the public sector. It had followed a downward trajectory after 2008. The more concerning issue is the perceptible shift of investors' preference towards physical assets as compared to financial assets. This can be attributable to a rise in inflationary pressures. Gross capital formation which is the independent variable of this study is a function of gross domestic savings (Reddy, 2019).

Gross National Income

Gross National Income (GNI) is sometimes known as gross national product and it is the total domestic and foreign output claimed by residents of an economy, consisting of gross domestic product plus factor incomes earned by foreign residents, minus income earned in the domestic economy by nonresidents. The Gross National Income is used to denote the total amount of money earned by the people and businesses in an economy. The wealth of an economy is also being tracked by it from one year to another and this buttresses the fact that GNI is a flow variable. The number therefore includes the gross domestic product of a country with the inclusion of income earned from it which is received from international sources (Cheng, 2021). In other terms, Gross national income is regarded as an alternative nomenclature for Gross national product that is used in measuring the wealth of an economy. It is also used in the calculation of the income of a nation in lieu of the outputs.

Foreign Direct Investment

According to Ugwuegbe, Modebe and Onyeonu (2014), FDI has to do with possession of asset in a country other than the home country. It could take two forms. Firstly, it could take the form of acquiring local firms by foreign owners, as well as acquiring stocks in local businesses in which the foreign firms have significant

investment. On another note, foreign direct investment could encompass the building of assets that would aid production in the foreign country of interest—these assets could be entirely new or basically the refurbishing of existing ones. The thrust of foreign direct investment entails acquiring control and not just transferring resources from parent to the subsidiary. Most of the time, outside the fact that the subsidiaries are obliged to report on their financials to the parent, they usually are a part of the composite structure. In a definition put forward by the World Bank (2018), Foreign Direct Investment (FDI) could be viewed as a commitment towards a lasting management asset (normally 10% of voting stock) in a business different from the country where the investing firm operates. Furthermore, (FDI) has also been seen as a vital factor that can spur growth in the economy of developing nations because the effect on economic growth is a consequence of the domestic investment, raising of required capital and by engineering the distribution of technology transfer in the local countries (Falki 2009).

Theoretical Framework

The Accelerator Theory of Investments

The Accelerator theory of investment (for foreign direct investment) is a theory that has proved to be helpful to a variety of economies. It states that as demand for goods and services or income increases in an economy, it will result in a positive effect because firm investment will rise as well. Furthermore, it was proposed that as the levels of levels result in excessiveness in terms of in demand, corporate organizations with alternatives in terms of meeting customer demands are advantageous because they can satisfy them. They can accomplish this goal by either raising prices to cause demand to fall and only those who can afford it to buy it, or by will expenditure to cause demand to rise and only those who can afford it to buy it. As a result, the hypothesis implies that most firms want to increase output in order to increase profits. The theory goes on to illustrate how this expansion draws further buyers, which in turn accelerates expansion (Kanu & Ozurumba, 2014). The accelerator theory of investment was used as the theoretical basis for this study in order to understand the macroeconomic determinants of capital formation in Nigeria. According to the theory, as income or consumption rises, expenditure rises by a factor of two. It means that as people's income and spending increase, the economy expands. As a result, more capital would be required to manufacture more products, as the existing capital stock is depleted. In this case, induced investment is a form of investment that is caused by changes in income or consumption. The accelerator is a numerical value that represents the relationship between increases in investment and increases in profits. The net induced investment will be positive if income increases and induced investment may fall to zero if the income or output remains constant.

The hypothetical illustration of the theory shows that if a certain amount of output (Y) is required to be produced and the capital-output ratio is, the required amount of investment to produce the required output (Y) is given as:

$$K_t = \alpha Y_t$$

Where; K is the stock of capital;

Y stands for the level of output or income; α is the capital – output ratio; and t is time. The capital-output ratio

α is K/Y and in the theory of accelerator, the capital output ratio is assumed to be constant. Therefore, under the assumption of constant capital output ratio, changes in output are made possible by changes in the stock of capital.

Empirical Review

Meyer and Sanusi (2019) investigate the causal relationship between capital investment, income growth and employment in South Africa using a quarterly data set from 1995 to 2016. Using the Johansen co-integration and Vector Error Correction Models (VECM), the empirical results suggest that there exists a long run relationship between domestic capital formation, employment and income growth in South Africa. Also, a uni-causal relationship running from economic growth to investment was confirmed without a feedback. The study found investment has a direct impact relationship with employment in the long-run. The empirical findings discovered a bi-causal relationship between employment and income growth, where as a one way directional relationship was found from investment to employment. The study concludes that even though a two-way causal relation was reported between employment and income growth, however, a jobless growth was confirmed as income failed to translate to improved employment in the long-run.

Kanu and Ozurumba (2019) used multiple regressions to investigate the impact of capital production on Nigeria's economic growth. It was discovered that gross fixed capital formation had no significant impact on economic growth in the short run, but that gross fixed capital formation, total exports, and the lagged values of GDP had positive long run relationships with economic growth in Nigeria, according to the VAR model estimate. It was also discovered that imports (IMP), total national savings (TNSV), and economic growth have an inverse relationship, whereas GDP has a unidirectional causal relationship with export (EXP), gross fixed capital formation (GFCF), import (IMP), and total nation savings (TNSV). As a result, the research recommended that Nigeria's federal government reprioritize her demands by reducing her bogus/burgeoning recurring expenditures. Which account for almost 70% of her entire spending profile. This will assist in freeing up much-needed savings for infrastructure development. The research also suggests that Nigerians be forced to mobilize the required amount of gross national savings in order to attract foreign direct investment. This is critical because FDI will assist in supplementing our local savings. The research also suggests that the government work on potentially exportable commodities, with the proceeds going toward the purchase of needed technological instruments and components.

Ajose and Oyedokun (2018) looked into the impact of capital accumulation on Nigerian economic growth. To determine the impact of capital formation and economic growth in Nigeria, the researchers used trend analysis and advanced econometrics tests. The unit root test was performed to determine whether the variables employed in the analysis were stationary or not. For the period 1980-2016, the model was put through a co-integration test to see if there was a long run relationship between capital production and economic growth in Nigeria. For the period 1980-2016, the granger causality test was employed to establish the causation between capital formation and economic growth in Nigeria. None of the models were stationary at level, but they were all stationary at first difference, according to the findings. The findings also reveal that there is a long –run substantial association between the variables studied, as well as a causal relationship between capital production and economic growth in Nigeria during the time period under consideration. In Nigeria, the results similarly found a non-significant negative link between economic growth and capital formation. According to the study, policymakers in Nigeria should establish specific investor-friendly policies to encourage, promote, and attract greater capital inflows, as well as provide a favourable and enabling environment for gross fixed capital creation to prosper. There is a need to reduce speculative and increase investment in the actual economy.

Mwesigwa (2018) examine the role of FDI and trade openness on capital formation in Uganda for the period 1984-2016 using the ARDL bound test. The study found that both FDI and trade openness are key determinants of capital formation in the long-run. However, in the short-run, they do not play a significant role in the determination of capital formation. Other variables germane to capital formation determination in the long-run are savings rate and external debt volume, while the total debt from external sources is important in the short-run.

Reddy (2019) investigated the trend and factor determinant of capital investment in Fiji from 1974 to 1998

using multiple regression analysis. This was based on the fact that capital formation in the country has been lagging which is mainly from the private sector compared with the public sector after decomposing it since the period of 1980s. Among the various factors identified as key factors that affect capital formation are savings, foreign direct investment, income, low interest rate, and political stability.

Osundina and Osundina (2014) examine the problem that has to do with inadequacies of savings as well as the formation of capital and their relationship with the growth of an economy using Nigeria as the casestudy. The study also addresses some methodological issues that underline the macroeconomic aggregates of savings and capital accumulation. It thus identified policy that can be recommended for these linkages between savings and economic growth as well as that of between capital accumulation and economic growth in Nigeria. Time series data for a thirty year period from 1980 to 2012 was used while savings, investment and Growth models were adopted. In terms of the findings, savings model showed that investment and gross domestic product have direct and significant effects on savings; inflation has an inverse but insignificant effect on savings in Nigeria. Also, lending rate has a positive but less significant impact on aggregatesavings. It was also discovered that there is a significant relationship between savings and investment expenditure in Nigeria. Furthermore, investment has a positive but insignificant impact on economic growth while savings has a positive and significant impact on economic growth in Nigeria. Based on the findings, it was therefore recommended that, special focus should be centered on to economic and socio-culturalshocks. Also, specific attention must be paid on investment climate in such a way as to curb inflation in Nigeria for the enhancement of macroeconomic stability and economic development.

Lucky and Uzah (2016) investigated the elements that influence Nigerian capital formation by putting Jhingan's capital formation propositions to the test. Gross fixed capital formation was modeled as a function of broad supply, credit to the private sector, gross national savings, commercial banks' lending rate, exchange rate, inflation rate, external debt, public expenditure, government revenue, terms of trade, and operating surplus using time series data. The dynamic relationship between the variables was tested using the Co-integration test, Augmented Dickey Fuller Unit Root Test, Granger Causality Test, and Vector Correction Model. The outcome revealed that money supply, gross national savings, exchange rate, external debt, and terms of trade all have a negative and insignificant relationship with capital formation, whereas credit to the private sector, lending rate, inflation rate, public expenditure, government revenue, and operating surplus all have a positive and insignificant relationship. The economic factors explained 86.0 percent of total capital creation variance, and the overall test was statistically significant at 5%. The findings of the study show that economic variables have a substantial link with Nigerian gross fixed capital formation, confirming Jhingan's hypothesis.

Between 1980 and 2012, Okafor (2015) researched the relationship between private capital formation and savings in Nigeria. It used the ordinary least squares techniques, co-integration and an error correction mechanism to reduce the risk of estimating false relationships while maintaining long run data. According to the findings, capital expenditure and inflation have negative and minor effects on gross fixed private capital formation, while savings have a negative and significant impact. FDI, RGDP, and the prime lending rate all had a positive and significant impact on gross fixed private capital formation having a positive and significant impact on the current value(s). The study suggests. Among other things, encouraging a savings culture and creating an environment that encourages investing.

METHODOLOGY

The study examines the determinants of capital formation focusing on the period from 1982 to 2019. The research design is a causal study approach that focuses on causal relationships between or among a number of factors. For the purpose of data analysis Normality test, test for stationarity, heteroscedasticity test, Augmented Dickey Fuller (ADF), F-bound Test and Auto-regressive Distributed Lag (ARDL) model was employed to determine the long-term dynamics in the study.

Model Specification

The study adopted Kripfganz and Schneider (2018) model of Auto-regressive Distributed Lag (ARDL) model, the study 'ARDL, Estimating autoregressive distributed lag and equilibrium correction models was express in mathematical form as:

$$Y_t = c_0 + c_{1t} + X \sum \phi_i Y_{t-i} + \sum \beta_i x_{t-i} + u_t, \dots \dots \dots (1)$$

$p \geq 1, q \geq 0$, for simplicity assuming that the lag order q is the same for all variables in the $K \times 1$ vector x_t .

Where;

Y = Dependent Variables,

X = Independent variables,

ϕ = 1st difference of a variable,

c_0 = a constant,

$t-i$ = lagged time trend and,

μ_t = the white noise error.

The model for the study is therefore re-specified in order to capture other supporting variables which were specified as:

$$\Delta GFCF/GDP_{rt} = \alpha_0 + \sum \beta_1 GFCF/GDP_{rt-1} + \sum \beta_2 \Delta E/GDP_{t-i} + \sum \beta_3 \Delta GNI/GDP_{t-i} + \sum \beta_4 \Delta FDI/GDP_{t-i} + \sum \beta_5 \Delta GNS/GDP_{t-i} + \lambda_1 GFCF_{t-i} /GDP_{rt-i} + \lambda_2 E/GDP_{t-i} + \lambda_3 GNI/GDP_{t-i} + \lambda_4 FDI/GDP_{t-i} + \lambda_5 GNS/GDP_{t-i} + \mu_t \dots \dots \dots 2.$$

Where;

$GFCF_{t-i}/GDP_{t-1}$ is Gross fixed capital formation as a ratio of Gross Domestic Product in lag terms.

E_{t-i} /GDP_{t-i} is Export Earnings as a ratio of Gross Domestic Product in lag terms.

GNI_{t-i}/GDP_{t-i} is Gross National Income as a ratio of Gross Domestic Product in lag terms.

FDI_{t-i}/GDP_{t-i} is Foreign direct investment as a ratio of Gross Domestic Product in lag terms.

GNS_{t-i}/GDP_t is Gross National Savings as a ratio of Gross Domestic Product in lag terms.

Operationalization and Apriori Expectations of the Variables

Variable Type	Variable	Operationalization and proxy of measure	Measurement	Model	A priori	Source
Dependent	Capital Formation	Gross fixed capital formation; GFCF/GDPt	Value (USD)	Time series ARDL model		World Development Indicator/ Central Bank of Nigeria (CBN)
Independent	Export Earnings	E/GDPt	Value (USD)	Time series ARDL model	Positive	World Development Indicator/ Central Bank of Nigeria (CBN)

Independent	Foreign direct investment	FDI/GDP _t	Value (USD)	Time series ARDL model	Positive	World Development Indicator/ Central Bank of Nigeria (CBN)
Independent	Gross National Savings	GNI/GDP _t	Value (USD)	Time series ARDL model	Positive	World Development Indicator/ Central Bank of Nigeria (CBN)
Independent	Gross National Income	GNS/GDP _t	Value (USD)	Time series ARDL model	Positive	World Development Indicator/ Central Bank of Nigeria (CBN)
Independent	Gross Domestic Product	GDP _t	Value (USD)	Time series ARDL model	Positive	World Development Indicator/ Central Bank of Nigeria (CBN)

Source: Authors Compilations

PRESENTATION OF RESULTS

Table 1: Descriptive Analysis

	GFCF/GDP	FDI/GDP	E/GDP	GNI/GDP	GNS/GDP
Mean	11.79155	2.897967	28.62865	4.224507	20.85395
Median	12.08816	2.534126	31.32981	3.737054	19.27469
Maximum	23.00650	10.83256	51.73036	32.86902	39.31757
Minimum	5.458996	0.650345	9.222135	-13.50883	1.829658
Std. Dev.	3.785819	2.254325	11.65737	8.221729	7.744165
Skewness	0.415892	1.776141	-0.173809	0.882915	0.509295
Kurtosis	3.217222	6.361841	2.003493	5.926935	3.562102
Jarque-Bera	1.139367	36.87771	1.717207	18.01454	2.086624
Probability	0.565704	0.000000	0.423753	0.000123	0.352286
Sum	436.2873	107.2248	1059.260	156.3068	771.5962
Sum Sq. Dev.	515.9674	182.9513	4892.197	2433.486	2158.996
Observations	39	39	39	39	39

Source: Authors Computation with E-views Statistical Package (2022)

Recall that the variables are in percentages and from the mean it showed that gross fixed capital formation as a percentage of GDP has a mean of 11.8% over the 39 year period. FDI as a percentage of GDP has a mean of 2.9%, export Earnings as a percentage of GDP has a mean of 28.6%, GNI as a percentage of GDP has a mean of 4.22% and GNS a percentage of GDP has a mean of 20.9. The maximum and minimum

values were: 23% and 5.5% for gross fixed capital formation as a percentage of GDP; 10.8% and 0.65% for FDI as a percentage of GDP; 51.7% and 9.2% for export Earnings as a percentage of GDP; 32.9% and -13.51 for GNI as a percentage of GDP and 39.3% and 1.83% for GNS a percentage of GDP respectively.

In relation to the skewness of the variables, only export earning is negatively skewed and this is not far-fetched from the fact that for the thirty nine period Nigeria economy is more of a importing nation than of exporting hence a negative balance of payments. The table above showed the descriptive analysis of the five variables used in the analysis. The skewness values were: 0.42, 1.78, -0.17, 0.88 and 0.51 for FDI as a percentage of GDP, export earnings as a percentage of GDP, GNI as a percentage of GDP, and GNS a percentage of GDP respectively.

Stationarity Test

The test was conducted using the Augmented Dickey Fuller and Philip Peron methodologies.

Table 2: ADF UNIT ROOT TEST

Series	ADF test	Critical value @ 5%	Integration	PP statistic value	Critical value @ 5%	Integration	Remark
GFCF/GDP	-4.795142	-2.941145	I(0)*	-4.795142	-2.941145	I(0)**	Stationary
FDI/GDP	-3.473042	-2.941145	I(0)*	-3.406604	-2.941145	I(0)*	Stationary
E/GDP	-9.087887	-2.943427	I(1)**	-9.087887	-3.621023	I(1)**	Stationary
GNI/GDP	-5.905958	-2.945842	I(0)*	-5.960266	-2.945842	I(0)*	Stationary
GNS/GDP	-4.516274	-2.941145	I(0)*	-4.505305	-2.941145	I(0)*	Stationary

Source: Author’s Computation with E-views Statistical Package (2022)

The results of the unit root tests are presented in Table 4.2 above using the Augmented Dickey Fuller methodology (ADF) and Philip Peron. Using the Augmented Dickey Fuller methodology (ADF), it was therefore discovered that all the variables were stationary at level safe E/GDP which is stationary at first difference. Additionally, for four of the variables, the null hypotheses were rejected at level with no lag. This means that these variables were stationary which implies that they were I(0) series at levels. Therefore, at level, the hypotheses of no unit root were rejected for the four variables. The stationarity test results above showed that the FDI as a percentage of GDP was stationary at level with -3.406 t-statistics and critical value of -2.94 at 5% level, Gross fixed capital formation as a percentage of GDP with -4.795 t-statistics and critical value of -2.94 at 5% level, GNS a percentage of GDP with -4.505t-statistics and critical value of -2.94 at 5% level, GNI a percentage of GDP with -5.96 t-statistics and critical value of -2.94 at 5% level while export Earnings as a percentage of GDP with -9.087 t-statistics and -2.94 at 5% critical value was stationary at first difference. In order to confirm these results, Philip Peron (PP) was also use to check the stationarity of the variables and it was also discovered that all the variables were stationary the same way as they were using Augmented Dickey Fuller methodology (ADF). Here also, The stationarity test results above showed that the FDI as a percentage of GDP was stationary at level with -3.40 t-statistics and critical value of -2.94 at 5% level, Gross fixed capital formation as a percentage of GDP with -4.795 t-statistics and critical value of -2.94 at 5% level, GNS a percentage of GDP with -4.51 t-statistics and critical value of -2.94 at 5% level, GNI a percentage of GDP with -5.91 t-statistics and critical value of -2.94 at 5% level while export Earnings as a percentage of GDP with -9.09 t-statistics and -2.94 at 5% critical value was stationary at first difference. Based on the above analysis and results that all the variables were not stationary at level the use of f-Bound test (long Run) and Autoregressive Distributed Lag Model (short run) is necessary.

Stability Diagnostic Test

This test is paramount in this research work for the purpose of providing evidence for the stability of log-run relationships amongst the variables in the model since the reduced rank structure allows one to separately test for the stability of the long run relationships and the stability of the speed of adjustment towards equilibrium.

Table3: Ramsey RESET Test

Ramsey RESET Test			
	Value	Df	Probability
t-statistic	2.133617	11	0.0056
F-statistic	4.552323	(1, 11)	0.0056

Source: Author’s Computation with E-views Statistical Package (2022)

From the table above, it was discovered that there is stability in the model because the critical value of the t-statistics is 2.133617 while its probability is 0.0056 which is less than 5% level of significant. Also, for the F-Statistics, the critical value of the t-statistics is 4.552323 while its probability is 0.0056 which is less than 5% level of significant.

Serial Correlation Test

This is one of the serial correlation test was done using Breusch-Godfrey Serial Correlation LM Test.

Table 4:Breusch-Godfrey Serial Correlation LM Test:

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.697502	Prob. F(2,10)	0.0052
Obs*R-squared	4.284786	Prob. Chi-Square(2)	0.1174

Source: Author’s Computation with E-views Statistical Package (2022)

From the table above, it was discovered that there is no serial correlation amongst the error terms or dummy variables in the model because the critical value of the F-Statistics is 0.697 while its probability is 0.0052 which is less than 5% level of significant.

Heteroskasticity Test

This test is for linear regression model as in the case of this research work. It assumes that the error terms are normally distributed. It therefore tests whether the variance of the error from the regression is dependent on the values of the dependent variables. This test was done using Breusch-Pagan-Godfrey which is presented in the table below.

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.878185	Prob. F(22,12)	0.0063
Obs *R-squared	21.59007	Prob. Chi-Square(22)	0.0484
Scaled explained SS	3.292804	Prob. Chi-Square(22)	0.0050

Source: Author’s Computation with E-views Statistical Package (2022)

From the table above, it was discovered that there is no Heteroskedasticity amongst the error terms or dummy variables in the model because the critical value of the F-Statistics is 0.878185 while its probability is 0.0063 which is less than 5% level of significant.

Long Run Analysis (F-Bound Test)

Since the variables are not stationary at levels I(0), therefore it requires the use of Autoregressive distributed Lags method (ARDL). However, it requires that the long run relationship among the variables is carried out before the methodology is done. This was carried out using the F-bound test.

Table 6: F-Bound Test

Significance	I(0) Bound	I(1) Bound	F-statistics	K
10%	2.45	3.52	1.279311	4
5%	2.86	4.01		
2.5%	3.25	4.49		
1%	3.74	5.06		
Dependent Variable	F-Statistics	Co-integration	Decision	
GFCE/GDP	15.65617		Estimate ARDL	

Source: Author’s Computation with E-views Statistical Package (2022)

From the table above which is the result from the bound test at I(0) and I(1) since the variables are not stationary at levels. In analyzing through the use of bound test results, decision of existence of co-integration is made when the F-statistics is greater than the I(1) bound and at the particular level of significance. In the case above, the F-statistics is greater than I(1) bound at 5% significant level. The test showed that the F statistics (1.2793) is lesser than the I(1) bound at 5% significant level (4.01), by implication there is no long run relationship or co-integration between capital formation and its determinants which are; export earnings, Gross national income, gross national savings, and foreign direct investment in Nigeria between 1982 and 2019 which is the period under review. Conclusively, this test examines the null hypothesis (H_0) of absence of long run relationship among estimated variables against the alternative hypothesis (H_1). The results of table 4.6 showed the absence of long run nexus among the variables as the estimated F-bounds is significant at (5%) and thus there is a long run relationship between the dependent and the independent variables of the study.

The findings of the F-bound test was negated by the study of Kanu and Ozurumba (2019) who claimed that total exports and the lagged values of GDP had positive long run relationships with economic growth in Nigeria. Unlike in the study where the researcher found out that export earnings as a ratio of GDP has no long run relationship with capital formation in Nigeria. The research work of Ajose and Oyedokun (2018) lent credence to the current study by revealing that negative non-significant relationship between capital formation and its determinants in Nigeria.

Short Run Analysis

The short run analysis of the study is necessary since we have been able to discover that there exists no long run relationship between capital formation and its determinants through the use of F-bound test. Hence, the short run relationship was done using ARDL model which is presented below.

Table 7: ARDL Results

Variable	Coefficient	t-Statistic	Prob.*
GFCFGDP(-1)	0.380350	3.520667	0.0014
GNIGDP	0.005485	0.130796	0.0068
GNSGDP	0.111473	1.963188	0.0090
GNSGDP(-1)	0.074722	1.598176	0.0205
FDIGDP	-0.028019	0.166366	0.0190
EGDP	-0.132956	2.569643	0.0154
C	7.103948	3.571070	0.0012
R-squared	0.771716		
Adjusted R-squared	0.726059		
S.E. of regression	1.981473		
Sum squared resid	117.7870		
Log likelihood	-73.92299		
F-statistic	16.90256		
Durbin-Watson stat	1.888847		
Prob(F-statistic)	0.000000		

Source: Author's Computation with E-views Statistical Package (2022)

The ARDL results of the study as presented in table 4.7 above that there is a theoretical and statistical significance of the estimated parameters of the regression result that is, the short run relationship between export earnings, gross national income, gross national savings, FDI and capital formation. It was discovered that two of the explanatory variables, gross national savings and gross national income were significant and positively related to capital formation while the other two, export earnings and foreign direct investment were negatively significant to capital formation. The coefficient of GNI a percentage of GDP was 0.01 which implies that a unit change in GNI led to about 0.01 unit increase in capital formation during the period under review. This therefore conforms to apriori expectation of a positive relationship between Gross national Income and capital formation in an economy. Also, the coefficient of GNS a percentage of GDP was 0.111 which implies that a unit change in GNS led to about 0.111 unit increase in capital formation during the period under review. This therefore conforms to apriori expectation of a positive relationship between Gross national Savings and capital formation in an economy.

However, the coefficient of FDI as a percentage of GDP was -0.028 which implies that a unit change in FDI led to about 0.03 unit decline in capital formation during the period under review. This therefore failed to conform to apriori expectation of a positive relationship between foreign direct investment and capital formation in an economy. Furthermore, the coefficient of export Earnings as a percentage of GDP was -0.132 which implies that a unit change in export Earnings led to about 0.132 unit decline in capital formation during the period under review. This therefore failed to conform to apriori expectation of a positive relationship between Export Earnings and capital formation in an economy. The probability values of the t-statistics for the four variables were less than each and it implies they are each significant in the model adopted in the study. The probability values were; 0.0068 for GNI a percentage of GDP; that of GNS a percentage of GDP was 0.0090; that of FDI as a percentage of GDP was 0.0190; and that of export Earnings as a percentage of GDP was 0.0154. The critical value of F-statistics is 16.903 while its probability is 0.000 and it implies that the determinants of capital formation identified in the current study have significant impacts on capital formation. The R-squared of 0.772 showed that 77.2% of the variation in capital formation was explained by GNI, GNS, FDI and Export Earnings which are the explanatory variables of the study while 12.8% was explained by variables outside the model. The Durbin-Watson statistics of 1.89 showed that there is no serial correlation of the error terms in the model.

DISCUSSION OF FINDINGS

The findings of no long relationship amongst relationships was negated by the study of Kanu and Ozurumba (2019) who claimed that total exports and the lagged values of GDP had positive long run relationships with economic growth in Nigeria unlike in the study where the researcher found out that export earnings as a ratio of GDP has no long run relationship with capital formation in Nigeria. The findings of Ajose and Oyedokun (2018) lent credence to the current study by revealing that negative non-significant relationship between capital formation and its determinants in Nigeria.

Furthermore, the findings of long-run relationship between FDI and capital formation conform with the result of Meyer and Sanusi (2019) for South Africa. In the case of direction of relationship, the results contradict the positive relationship between FDI and capital formation found in the study of Sarkar (2016) for a cross-section of 65 countries, Amighini, McMillan and Sanfilippo (2017) for 53 developing countries mainly in the manufacturing sector, Mwesigwa (2018) for Uganda, Reddy (2019) for Fiji, and Meyer and Sanusi (2019) for South Africa. It thus implies that FDI does not contribute to improvement of capital accumulation in the long-run in Nigeria probably because most foreign investment are channeled in sectors that funds and its proceeds can easily be repatriated from the country.

Also, the study that lent credence to these findings that of Ajose and Oyedokun (2018) who examined the role of FDI and trade openness on capital formation in Uganda using the ARDL bound test. The study found that both FDI and trade openness are key determinants of capital formation in the long-run. However, in the short-run, they do not play a significant role in the determination of capital formation. Other variables germane to capital formation determination in the long-run are savings rate and external debt volume, while the total debt from external sources is important in the short-run.

In the main time, Osundina and Osundina (2014) lent credence to the current study as they examined the problem that has to do with inadequacies of savings as well as the formation of capital and their relationship with the growth of an economy. The study discovered that there is a significant relationship between savings and investment expenditure in Nigeria. Furthermore, investment has a positive but insignificant impact on economic growth while savings has a positive and significant impact on economic growth in Nigeria. Also, Okafor (2015) investigated the relationship between private capital formation and savings in Nigeria between 1980 and 2012. The study therefore had insignificant effects on gross fixed private capital formation with savings having a negative and significant effect which is different from the findings of the current study.

CONCLUSION

Almost all economists lay emphasis on capital formation as the major determinant of economic growth. According to the vicious circle of poverty in undeveloped countries which is an obstacle to growth can be broken through capital formation. Due to low level of income in such countries, demand, production and investment are deficient which are the key to growth. Development economists have traditionally maintained that capital formation is a fundamental cause and main key of economic growth in the long term. Capital formation possesses special importance for less Developed Countries (LDCs), the process of capital formation leads to the increase in national output and it also essential in meeting the requirement, of an increasing population in such economies. However, capital formation can be achieved through capital accumulation and can also be referred to as capital accumulation. Capital accumulation is a process which involves saving, borrows from accumulated savings for investment purposes.

Hence, capital formation supports growth and increases income. The purpose of this research is to obtain empirical evidence on the determinants of capital formation in Nigeria. The results show that FDI only influences capital formation negatively in the short-run while there is no long-run negative relationship with capital formation within the periods considered in Nigeria. The study also found that export earnings and gross national income have positive causal relationship with capital formation. Based on these results, the

study concluded that export earnings, gross national savings, gross national income, and foreign direct investment have significant relationship with the Nigerian capital formation within the periods under review.

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