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Impact of National Savings and Stock Market on Capital Formation in Nigeria

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Abstract

The study analyzed the roles played by national savings and stock market on capital formation process in Nigeria. Data spanning four decades (1980-2020) was sourced from statistical publications of the Central Bank of Nigeria (CBN) and World Bank World Development Indicators (WDI). Autoregressive distributive lag (ARDL) technique was used for analysis. Findings of the study reveal that despite national savings and stock market having a positive and significant impact on capital formation, capital formation remains weak and below the minimum required for growth and development within the Nigerian economy. The overall implication of the research findings is that Nigeria's economic growth has been hampered by low level savings and ineffective performance of the Nigerian stock market. The Study recommends that policies should be geared toward increasing level of national savings in order to boost capital formation and growth. It also recommended that the Nigeria stock market be liberalized to create an atmosphere favorable for investment which will constitute a favorable interest rate.

Keywords: *Nigerian stock Market, National savings, Capital Formation,*

1. Introduction

The importance of capital formation for the sustained growth and development of any economy cannot be overstated. Capital formation is the amount of current revenue that is saved and invested in order to boost output and income in the future. Therefore, capital generation is the main force behind economic growth and progress in any nation. A country's economic development is significantly impacted by the availability of capital stock. The economy's capacity to generate more goods and services at a faster rate leads to an increase in the country's production. Capital formation is responsible for economic growth, industrialization, and a decline in production costs.

Even though sufficient capital formation is necessary for growth and development, the majority of African nations exhibit weak capital formation. This issue was attributed to a decline in investment rates (Osundina & Osundina 2014). The most significant obstacle to sustained economic growth has been identified as a deficiency in capital formation (Onyinye, Idenyi & Ifeyinwa, 2017). Therefore, it is not surprising that one of the main topics in empirical macroeconomics is now the analysis of capital formation.

Economic growth and development are significantly harmed by the uncertainty in the process and dynamics of capital formation. As a result, in order to maintain a robust and healthy economic growth process, capital formation as a percentage of GDP should not be lower than 27%. (Harnandez-Cata, 2000, Mustapha, Nur-Aznin & Salahuddin, 2016).

Savings are the cornerstone of capital formation. This is because greater savings stimulate greater investment, which in turn raises capital stock and, eventually, results

in full employment, greater national savings, and increased output. It is possible to define national saving as the sum of an economy's public and private savings. For sustainable economic growth and development, the required saving rate must be at least 22-25% of GDP (Mustapha, Nur-Aznin & Salahuddin, 2016). Nigeria has had poor savings rates, especially during the last 20 years. Nigeria, like the majority of LDCs, is unable to reach large levels of individual savings due to factors such low per capita income, lavish and conspicuous expenditure by the few who could afford to save, and saving abroad. (Osundina & Osundina, 2014). Savings must be mobilized into productive resources that produce capital in order for savings to successfully be converted into capital formation and that is the stock market's primary purpose (Egoro & Obah. 2015). Ajao (2011) asserts that the stock market is a crucial tool for maximizing the efficiency of capital formation, which promotes economic growth. He clarified that the effectiveness of the stock market's capital allocation process can influence the overall growth of an economy.

Since its commencement (in 1960, as the Lagos Stock Exchange, changed to the Nigerian Stock Exchange (NSE) in 1977 and changed to Nigerian Exchange Group in 2021), the Nigerian stock market has witnessed tremendous growth (Soyode, 1990; Alile, 1997; Chioma, 2016). Nevertheless, despite its expansion, the Nigerian Exchange Group is still a small market, particularly when compared to other emerging stock markets, some of which are younger than the Nigerian Exchange Group itself. As of 2021 the Nigerian Exchange group has 328 listings with a market capitalization of US$ 68.1 billion, The Johannesburg Stock Exchange (JSE) is 132 years old and is the largest stock market in Africa with a capitalization of more than USD1 trillion.

Capital formation has been performing woefully across the years as data from central banks has shown that the ratio of capital formation to GDP in Nigeria is well below the 27% required for growth from 1984 - 2020. Savings on the other hand has been fluctuating during the years under study (1980-2022). Savings (%of GDP) hits its highest in 1981 at 87% and the lowest of only 16% in 2016 (WDI, 2022). The overall performance is not spectacular with an average of 40%. It can therefore be seen that, an enormous damage has been made on the Nigerian economy and in effect, capital formation.

Now from the foregoing few questions are raised, if savings forms the basis of capital formation in Nigeria, why is capital formation in Nigeria performing woefully? Do savings have impact on capital formation in Nigeria? Despite claimed growth in recent years is the Nigerian stock market effectively mobilizing savings to raise capital formation in Nigeria?

The above scenario has revealed an existing gap to the literature and thus necessitating an efficient, in depth, concentrated and specific study on the relationship between national savings and stock market on capital formation in Nigeria. Therefore, this study intends to fill the aforementioned gap in the existing literature with the sole aim of finding the impact of national savings and stock market in Nigeria.

2. Literature Review

Empirical Review

Nurudeen (2010) applied the Vector Autoregressive method to examine the causal relationship between national savings and economic development. According to the investigation's findings, economic growth precedes saving, indicating that Granger causes economic growth.

In their investigation into the relationship between domestic savings and economic growth in Nigeria, Abiodun and Basiru (2013). Using the Engle-Granger causality test, the conclusion was that savings lead to economic growth in a unidirectional manner. The study suggests that policymakers in Nigeria implement measures that will encourage savings in order to boost the country's economic growth.

Osundiuna and Osundina (2014) examined how low capital accumulation and savings effect economic growth in Nigeria. The study employed time series data from 1980 to 2012 using the OLS method. The results show that GDP and savings both have positive and significant effects on investment in Nigeria, with savings having a similar positive and significant influence. The results also show that investment has little effect on economic expansion. On the other side, savings had a favorable and significant effect on Nigeria's economic growth. The study recommend particular attention should be paid to economic and socio-cultural shocks specifically, the investment climate so as to ensure macroeconomic stability and economic development.

Ila and Radhika (2019), examined capital formation and savings in India. According to the study, raising capital formation and savings rates is necessary to meet India's burgeoning industrial and infrastructure demands. The two main barriers to foreign investment in India are investments in infrastructure and micro, small, and medium-sized businesses. The study showed that India's saving rate has recently fallen. However, a major issue for the economy is the intermediation of deposits to finance the growing demands of industry and infrastructure. According to the study, savings need to be channeled through intermediaries in order to finance infrastructure and SMEs.

The effects of gross national saving and capital formation on Nepal's GDP were examined by Arjun and Ananta (2021). Time series data from 1988 to 2020 were used in the study. There were several tests used, including the ARDL bound test, error correction model, heteroskedasticity, serial correlation test, normality test, CUSUM test, and CUSUM square test. The findings revealed a positive long-term relationship between gross national saving, gross capital formation, and GDP. Gross national saving and gross capital formation were discovered to be both individually and jointly significant in the long run explanation of GDP. The study suggest that saving must be utilized in the productive sector to promote growth.

Chioma (2016) finds that the growth of gross capital formation has a significant positive impact on the stock market in both the short- and long-term, using an autoregressive distributed lag model, generalized autoregressive conditional heteroscedasticity econometric technique, and quarterly time series data (1985q1-2014q4). Additionally, it was discovered that variations in the same stock market variables had a big impact on how volatile capital formation was in Nigeria during the study period. The study suggested that government should come up with more effective policy framework to encourage activities of the stock exchange market in order to improve sustainability in capital formation in the country.

Similar research was conducted on Nigeria's stock market and economic growth by Popoola, Ejemeyovwi, Alege,

Adu, and Onabote (2017). The model was tested using Pairwise Granger Causality Methods, Ordinary Least Squares, and the Johansen Cointegration Test in the paper. All share index and economic growth have a negative OLS result; the Johansen cointegration test revealed a long-term relationship between the variables. The Granger causality test results revealed a one-way causal relationship between stock market growth and economic expansion. The study suggested that actions be taken to enhance stock market performance in order to eventually have a positive impact on Nigeria's real gross domestic product.

Abina and Lemae (2019) to analyze Nigeria's capital market and economic performance. The study made use of the unit root, Johansen Co-integration, Error correction, and Granger Causality tests to examine the model. The results indicate a long-term, favorable association between the factors. The results of the causality test show that market capitalization and GDP are causally related in only one direction. The results also show a one-way causal relationship between the gross domestic product and the total value of new issues, respectively. As a result, the study concluded that Nigeria's capital market contributes significantly to economic expansion. The report suggests that the government should relax rules that are hindering the development of the Nigerian Stock Market.

Theoretical framework

The Harrod-Domar model clarified the economic principle that says that more investment results in greater growth. A nation must divert some of its resources from current consumption (or save) and invest them in capital formation in order to experience adequate growth and development. Saving is one of the main drivers of growth, according to the Harrod-Domar model. The argument is that in order to replace worn-out capital goods, every economy must set aside a specific portion of its national income. The model postulates that the growth rate of national income will be directly or positively related to saving ratio (i.e., the more an economy is able to save and invest from its GDP, the greater the growth of its GDP) and inversely or negatively; relate to the economy's capital/output ratio.

This theory is in line with the objective of this paper as the researcher is trying to find if saving is being mobilized effectively to increase capital formation and consequently growth in Nigeria.

3. Methodology

Model Specification

Generally, the specification of an economic model is based on economic theory and the available data (Sulaiman et al. 2015). To capture the objective of the research, taking into consideration the reviewed literature and the foregoing theoretical framework, capital formation model was developed in line with Harrod-Dommar model.

The models are mathematically specified as follows:

GFCF= F (GNS, MKCAP, NI, INT) ……[3.1]

The model can be presented in an econometric form as follows:

$GFCF_t = \beta 0t + \beta 1GNSt + \beta 2MKCAPt + \beta 3NIt + \beta 4INTt + \varepsilon_t$……[3.2]

Where;

GFCF= Gross Fixed Capital Formation.

GNS= Gross National Savings

MKCAP= Market Capitalization.

NI= New Issues.

INT= Interest Rate on Lending.

Method of Analysis

The study's model was estimated using the ARDL method. The adoption was because the ARDL model is good in determining both long and short run elasticity and relationships among variables. The model can also be used irrespective of the order of integration of the series. Finally, the ARDL method provides robust results for small sample sizes and very reliable estimates of

the long-run coefficients (Pesaran & Shin 1999) To ascertain whether the variables are stationary or not, the unit root test was applied to every variable used in the model. To determine the long-term relationship between the variables, the model was put through an ARDL bound co-integration test. From Equation 3.2, the unrestricted error correction model, (ECM) for ARDL is specified below:

$$\ln GFCG = \beta_{1t} + \sum_{i=1}^{n} \alpha_{1i} \ln GFCF_{t-i} + \sum_{i=1}^{n} \beta_{1i} \ln GNS_{t-i} + \sum_{i=1}^{n} \chi_{1i} \ln MKCAP_{t-i} + \sum_{i=1}^{n} \partial_{1i} \ln NI_{t-i} +$$

$$\sum_{i=1}^{n} \pi_{1i} \ln INT_{t-i} = \theta_1 \ln GFCF + \theta_1 \ln GNS + \theta_1 \ln MKCAP + \theta_1 \ln NI + \theta_1 \ln INT + \mu_t \quad [3.3]$$

Where Δ is first difference operator and *n* is optimal lag length.

To test the long-run cointegration relationship among the variables, the following hypotheses are stated:

H0: $\theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = 0$ (No cointegration)

Ha: $\theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq 0$ (Cointegration exists)

With the evidence of a long-run relationship among the variables, the following long-run (Equation 3.4) and short-run (Equation 3.5) models will be estimated simultaneously and the error correction term (ECT) in Equation is defined as in equation 3.6.

$$\ln GFCG = \beta_{2t} + \sum_{i=1}^{n} \beta_{2i} \ln GNS_{t-i} + \sum_{i=1}^{n} \chi_{2i} \ln MKCAP_{t-i} + \sum_{i=1}^{n} \partial_{2i} \ln NI_{t-i} + \sum_{i=1}^{n} \pi_{2i} \ln \Delta INT_{t-i} + \mu_t \quad [3.4]$$

$$\ln GFCG = \beta_{3t} + \sum_{i=1}^{n} \alpha_{3i} \ln \Delta GFCF_{t-i} + \sum_{i=1}^{n} \beta_{3i} \ln \Delta GNS_{t-i} + \sum_{i=1}^{n} \chi_{3i} \ln \Delta MKCAP_{t-i} + \sum_{i=1}^{n} \partial_{3i} \ln \Delta NI_{t-i} +$$

$$\sum_{i=1}^{n} \pi_{3i} \ln \Delta INT_{t-i} + \lambda ECT_{t-1} \quad [3.5]$$

$$ECT_t = \sum_{i=1}^{n} \alpha_{4i} \ln \Delta GFCF_{t-i} - \sum_{i=1}^{n} \beta_{4i} \ln \Delta GNS_{t-i} - \sum_{i=1}^{n} \chi_{4i} \ln \Delta MKCAP_{t-i} - \sum_{i=1}^{n} \partial_{4i} \ln \Delta NI_{t-i} - \sum_{i=1}^{n} \partial_{4i} \ln \Delta INT_{t-i} \quad [3.6]$$

4. Results and Discussion

Unit root test was conducted to ensure that none of the variables exceeded I(1) and also to establish the appropriateness of applying the methodology.

Unit root test was conducted to ensure that none of the variables exceeded I(1) and also to establish the appropriateness of applying the methodology.

Table 1: Unit Root Test Using Augmented Dickey Fuller (ADF) and Phillips Perron (PP).

Variables	ADF Test Statistics				PP Test Statistics			
	Constant		Trend		Constant		Trend	
	Level	First difference	Level	First Difference	Level	First Difference	Level	First Difference
$lnGFCF_t$	-1.907 (0.325)	-4.996 (0.000)***	-5.146 (0.000)***	-5.183 (0.000)***	-3.133 (0.032)**	-5.585 (0.000)***	-5.146 (0.000)***	-5.793 (0.000)***
lnGNS_t	-0.519 (0.876)	-6.997 (0.000)***	-1.856 (0.675)	-6.910 (0.000)***	-0.491 (0.882)	-6.989 (0.000)***	-1.809 (0.680)	-6.911 (0.000)***
ln$IMKCA P_t$	-2.408 (0.146)	-6.687 (0.000)***	-2.628 (0.270)	-6.624 (0.000)***	-2.518 (0.118)***	-6.675 (0.000)***	-2.878 (0.180)	-6.614 (0.000)***
lnNI_t	-3.515 (0.012)**	-9.119 (0.000)***	-3.634 (0.039)**	-8.989 (0.000) ***	-3.426 (0.015)**	-12.222 (0.000)***	-3.634 (0.039)**	-12.034 (0.000)***
lnINT_t	-4.454 (0.001)***	-10.836 (0.000)***	-5.138 (0.000)***	-10.746 (0.000)***	-4.474 (0.000)***	-17.275 (0.000)***	-5.074 (0.001)***	-17.237 (0.000)***

***, ** and * Denotes 1%,5% and 10% significance level respectively.

The result from Table 1 indicates that both ADF and PP reveal that all variables are either stationary at level I(0) or after first difference I(1). The results from both methods are identical.

The lags selected for the model is depicted in Tabe 2. From Table 2 it can be seen that LR, FPE, AIC, SC and HQ all suggested the use of lag 1. Therefore, lag 1 was selected for further estimations of the model.

Having identified the optimal lag length, the next step was to estimate the long-run relationship among the variables. The ARDL bound test was used (Pesaran et al., 2001).

Having identified the optimal lag length, the next step was to estimate the long-run relationship among the variables. The ARDL bound test was used.

Table 2: ***Optimal Lag Selection Based on Akaike Information Criteria (AIC) for Cointegration Test***

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-56.190	NA	0.000	3.343	3.519	3.405
1	34.270	155.793*	5.36e-0*	-0.792*	0.086*	-0.485*
2	45.333	16.594	7.31e-0	-0.518	1.064	0.034
4	56.043	13.684	1.08e-0	-0.224	2.062	0.573

Note. * indicate lag order selected by the criterion. LR = sequential modified LR test statistic; FPE = Final prediction error, AIC = Akaike information criteria, SC = Schwarz information criteria, HQ = Hannan-Quinn information criteria, LogL = log likelihood, LR = likelihood ratio.

The cointegration results of the model from Table 3 has proved the presence of co-integrating relationship in the model. This is because the calculated *F*-statistics of 4.259, is higher than the Narayan (2005) upper critical values at 5% significance level. Therefore, conclusively there is a long run relationship among the variables in the model.

After establishing a cointegration relationship among the variables, the long-run results are presented in Table 4.

Table 3: Bounds Test Result

Model	F-stats	Lag	Level of significance	Bounds critical values [Unrestricted intercept & no trend] I(0)	Bounds critical values [Unrestricted intercept & no trend] I(1)
($lnGDP_t lnGFCF_t lnGNS_t lnINF_t$)	**4.259**	1			
			10%	2.45	3.52
			5%	**2.86**	**4.01**
			2.5%	3.25	4.49
			1%	3.74	5.06

The Critical values are obtained from Narayan (2005) table case III. The boldness indicates the level of significance at which the F-statistic exceeds the upper bound.

Table 4: Estimated Long-run Coefficient Result

Dependent variable, $lnGFCF_t$		
Regressors	**Coefficient**	**T-ratio (p values)**
LnGNS	0.625	2.457 (0.001)**
LnMKCAP	0.447	1.913 (0.098)*
LnNI	0.013	5.357 (0.000)***
lnINT	-0.496	4.138 (0.000)***
C	6.837	-3.437 (0.005)***

***, ** and * Denotes 1%,5% and 10% significance level respectively.

From Table 4, our long run result shows that national savings has a positive and significant impact on capital formation in Nigeria. To be specific 1% increase in national savings will increase capital formation by 0.625%. This finding corresponds with the finding other researchers such as (Eduardo & Mathieu 2015; Ila & Radhika 2019; Arjun & Ananta 2021). This suggest that the national savings is a key contributor to capital formation in Nigeria.

This is no surprising as the World Bank measures capital formation by assessing the change in net savings. If the household savings rate is increasing, savers may invest the additional money and purchase stocks and bonds. When more households are saving within a country, that country may report a cash surplus, which is an encouraging sign for capital formation. More savings leads to extra investment within the economy and investment aids in increasing the rate of capital formation.

Market capitalization has a positive and significant relationship with capital formation in the long run. To be specific 1% increase in national savings will increase capital formation by 0.447%. New Issues also have a positive and significant impact on capital formation. 1% increase in New Issues will increase capital formation b 0.013%. These variables represent he performance of stock market in Nigeria. This therefore suggest that the Nigerian stock market is key contributor of capital formation in Nigeria. This finding corresponds with the finding of (Chioma, 2016).

Finally, in the long run, the coefficient of interest rate depicts a negatives and significant relationship with capital formation. 1% increase in interest rate will decrease capital formation by -0. 496%. This indicate that high rate of interest in the domestic economy discourages capital formation growth for the national economy. Investment is inversely related to interest

rates, if interest rates rise, the opportunity cost of investment also rises.

After establishing the long-run coefficient results, the short-run model of the first objective was estimated to obtain the short-run coefficients. The results are shown in Table 4.5

Table 5: The Estimated Short-run Coefficient of Model 1 Base on Akaike Information Criterion (AIC)

Dependent Variable, $\Delta lnGFCF_t$		
Regressors	**Coefficients**	**T-ratio (p value)**
$\Delta lnGFCF_t$	0.189	0.816 (0.420)
$\Delta lnGNS_t$	0.216	2.486 (0.005)**
$\Delta lnMKCAP_t$	0.093	2.462 (0.003)**
$\Delta lnNI$	0.014	1.492 (0.128)
$\Delta lnINT$	-0.155	-0.970 (0.656)
ECT_{t-1}	-0.254	-2.450 (0.004)***

* **, **and* Denotes 1%,5% and 10% significance level respectively.

Short run results from Table 5 shows that capital formation of previous year has a positive but insignificant impact on capital formation of current year.

Gross national savings also has a positive and significant impact on capital formation in the short run, this result is in line with the result from the long run results. This shows that national savings is a key variable influencing capital formation in Nigeria even in the short run. 1% increase in national savings will increase capital formation by 0.216%.

Market capitalization has a positive and significant relationship with capital formation in the short run. New issues also have a positive and significant relationship with capital formation in the short run. This suggest that the Nigerian stock market is key contributor of capital formation in Nigeria even in the short run. 1% increase in market capitalization will increase capital formation by 0. 093% and 1 % increase in new issues will increase capital formation by 0.014%.,

Interest rate on the other hand has a positive but insignificant impact on capital formation. This shows that interest rate is not a good determinants of capital formation in the short run.

The *ECT term* is less than one, negative and statistically significant at 5 %. The adjustment mechanism in the model is slow with (-0.254) 25 % speed of adjustment to equilibrium.Table 6 shows the goodness fit of the model.

Table 6: Goodness fit the Model

R-square	0.705
DW-statistics	2.04
Prob(F-statistic)	5.448 (0.000)***

* **, **and* Denotes 1%,5% and 10% significance level respectively.

The R-square of the model from Table 4.8 shows that 70% of the proportion of the dependent variable has been explained by the independent variables. This shows that the model is good fit. The Durbin Watson statistics shows that the model is free from first order serial correlation because it falls within the range of 1.5 and 2.5. Also, the probability of F-statistics is significant at less than 5% i.e. (0.000<0.05), this means

that the independent variables are jointly significant in inducing the dependent variable (GFCF).

To ensure the reliability of the estimates, diagnostic tests of serial correlation, functional form, normality, and heteroscedasticity were conducted and reported in Table 4.7.

Table 7: Diagnostic Test for Model 1

Test Statistics	F Version
A. Serial Correlation	F(2,26) = 0.948 (0.400)
B. Functional form	F(1,27) = 1.020 (0.316)
C. Normality	1.791 = (0.408)
D. Heteroskedasticity	F(1,36) = 0.245 (0.623)

* **, **and* Denotes 1%,5% and 10% significance level respectively.

The result of the diagnostic tests in Table 4.7 reveals that the Breusch-Godfrey LM test shows that there is no presence of serial correlation in the model. The Jarque-Bera test shows that the data in the model has been normally distributed. The Heteroskedasticity (ARCH) result shows no sign of heteroskedasticity in the model. The Ramsey RESET test shows that the model has been correctly specified. This means that the model is free from serial correlation, heteroscedasticity, functional form and normality problems. As such, this model could produce reliable results.

Cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests for stability of the ARDL model along the studied periods was conducted. It is suggested that for a model to be stable along the sampled period, the residuals line must be within the straight lines of the critical bounds at a 5% significance level. Figure 2 and 3 depict the results. The results show that the model is sable within the study period.

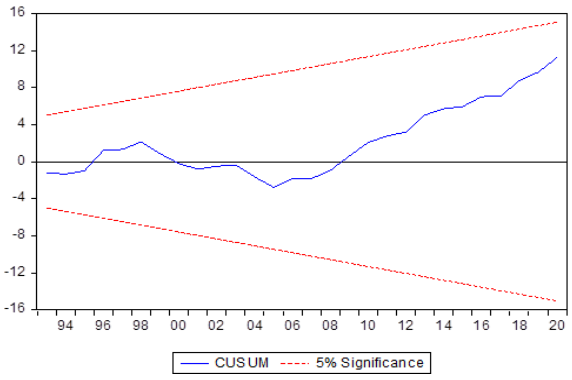

Figure 2: CUSUM

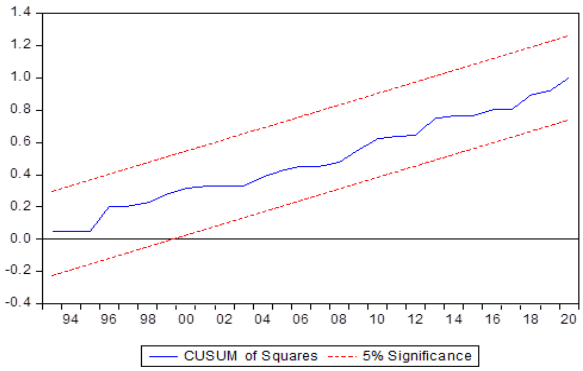

Figure 3: CUSUM of Squares

5. Conclusion and Recommendations

The study looks into how Nigerian stock market activity and national savings affect capital formation. Despite the low savings rate in the country, the study shows that national savings have a beneficial and considerable long-term and short-term influence on capital formation in Nigeria. The study also shows that the stock market has a big impact on capital formation over the long and short terms. However, it was discovered that interest rates have a negative and considerable impact on capital formation over the long and short terms.

Having summarized the findings above, based on the findings of the paper the study recommends that:

Nigerian policy makers should focus on policies that will increasing the level of domestic private savings, this is because a crucial problem for Nigeria in recent years is lack of investments which restricts economic growth. The basis for investments is savings.

The Nigerian stock market has shown promise in promoting capital accumulation and thus growth in Nigeria. Nigerian capital market should be more liberalized, all laws that that hinder the effective and efficient functioning of the stock market should be relaxed, in order to achieve the much-needed market liquidity that will attract much needed investment in the form of gross capital formation, that will in turn, stimulate industrial and economic growth. Infrastructural deficiency is also a major hindrance affecting the pace of stock market development and investment growth in Nigeria. This problem also needs to be addressed. Public enlightenment on the importance of the stock market should be encouraged Information dissemination should be discouraged.

The government should control interest rate favorably in the stock market to attract more investment and aid in the growth of the stock market.

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