

Determinant of Investment in Nigeria: An Econometric Analysis

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Abstract: *This research is set out to examine the determinant of investment in Nigeria for the period 1980 to 2018. The selected macroeconomic variables are Inflation rate (INF), Exchange rate (EXR), Government expenditure (GEX) and Interest rate (INT). The study is an attempt to evaluate how these key macroeconomic variables explain private investment in Nigeria. The scientific method adopted for this investigation is multiple regression analysis using Auto regressive distributed lag model to estimate both the short run and long run relationship between the regressor and the regressand. The result obtained indicate that the selected macroeconomic variables are in line with apriori theoretical expectation. Based on the findings, the researcher made the following recommendations: government should make Nigerian economy a conducive environment for private investment as a matter of high national priority by putting in place policies through practical strategies that will ensure consistent, moderate and acceptable levels of inflation rate, interest rate, exchange rate and increase expenditure on basic infrastructure in the Nigeria economy.*

Key words: *Private Investment, Inflation, Interest rate, Exchange rate, Government expenditure, Auto regressive distributed lag model*

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INTRODUCTION

Investment is a key variable necessary for economic growth and development of countries. It is the engine for economic growth and is one of the most important weapons in poverty alleviation. It improves the productive capacity of the nation and also creates job opportunity for many people. One of the most important components of investment is private investment in which business institutions engage in the production of goods and services with the twin objectives of profit maximization and improving national economy. That is why due attention has been given to private investment. A rate of investment is one of the key factors that differentiate developed countries from developing countries. In high-growth countries investment is high, where as it is low in low growth countries. The implication of low investment is that the productive capacity of the economy fails to increase. This in turn leads to lower rates of growth and job creation, and fewer opportunities for the poor to improve their livelihoods (White, 2005). As of Sackey (2007) countries with high standards of living are those who have shifted the economic structure from

traditional and less diversified to a more diversified one. Commitment to investment is the central issue in the process of structural diversification.

Investment plays important role in functioning of an economy whether developed or underdeveloped. Economic growth of most economies is derived from investment in such economy. Measures are taken by government of various countries of which Nigeria is not an exception to encourage investment so as to boost high productivity, innovation, employment level, standard of living, reduce poverty level and ultimately accelerate economic growth (Ayeji, 2014). Investment in various sectors of the economy stimulate aggregate employment output, demand income which also increase the government revenue for the provision of basic industrial and agricultural inputs towards the growth and development of any economy. This entails that investment multiplier increase national income which in turn increases savings for investment, consumption and aggregate demand level. The effect will be the rising standard of living of the citizenry.

No doubt, there are so many factors (internal and external) that influence investment. This therefore means that for a developing country like Nigeria to attain the goal of economic growth, amongst other economic objectives, there is need to increase the tempo of investment that would lead to higher economic growth with much focus on such factors that determine investments within and outside the national economy.

Statement of problem

It has been observed that despite the importance accorded private investment as the prime mover of the economy and after many years of economic adjustment and various economic reform programmes of successive governments, available relevant economic indicators show slow and minimal improvement in private investment in Nigeria. Investment is influenced by several factors which include, inflation rate, government expenditure, interest rates, exchange rates among others. The private investors will flourish only in a supportive environment of cost reductions in power, stable exchange rate and moderate inflation. The huge money spent on the generation of power by the private domestic investors in Nigeria, would escalate the prices of their products. Many private domestic investors have closed down and many have relocated to other investment friendly areas, because of the high cost of generating power in the country, high cost of fund, and exchange rate instability.

Inflation rate, interest rate and exchange rate are important determinant of private investment. Though moderate inflation is needed for business to strive profitably in a country, high and rising inflation rates is an indicator of macroeconomic instability and it affects private investment adversely. Oshikoya (1994) asserted that in developing countries, a high inflation rate has negative impact on private investment. By reducing the value of money, it discourages saving and lowers the economy's saving rate which accumulates investible funds for investment. The unsteady behaviour of investment in Nigeria has become a source of worry to all who are concerned about the growth of the country. The low level of investment has appeared to be the major problem facing the economy. Despite policies made by the government of Nigeria at different times to tackle the problem, the menace still persists. According to Johnson (2002), successive governments have implemented policies and strategies to raise the level of investment but these policies so far have been erratic. It has however, been found that a major problem is that government is so much concerned about policies to boost investment without much knowledge or investigations of the determinants of investment (Ajaikaiye 2002).

It is on this note that this paper examines the issues on and determinants of private

investment as it relates to Nigeria. In this study, quantitative analysis is employed and as well examine some non-quantitative determinants of private investment in Nigeria.

Research Questions

This study is aimed at finding answers to the following research questions

1. Does inflation rate predict investment in Nigeria?
2. To what extent has exchange rate impacted on investment in Nigeria?
3. Is there any significant impact between interest rate and investment in Nigeria?
4. Does government expenditure impact on investment in Nigeria?
5. Is there any significant long run relationship between the identified independent variables and investment in Nigeria?

Objectives of the Study

The broad objective of the study is to determine the relationship between human capital investment and economic growth in Nigeria. Specifically, the study will:-

1. Evaluate if inflation significantly predicts investment in Nigeria
2. Determine if exchange rate impact on investment in Nigeria.
3. Examine to what extent interest rate have explained investment in Nigeria
4. Investigate if government expenditure significantly impact on investment in Nigeria
5. Establish the existence or not if any significant long run relationship exist between the identified independent variables and investment in Nigeria.

Research Hypotheses

For the proper analysis of this research work, the following hypotheses have been posited

1. **H₀₁**: Inflation does not significantly predict investment in Nigeria.
2. **H₀₂**: Exchange rate does not significantly impact on investment in Nigeria
3. **H₀₃**: Interest rate does not significantly explain investment in Nigeria
4. **H₀₄**: Government expenditure does not impact on investment in Nigeria
5. **H₀₅**: long run relationship does not exist between the identified independent variables and investment in Nigeria.

EMPIRICAL LITERATURE

Duruchi & Ojiegbe (2015), examined the determinants of investments in the Nigerian Economy: An Empirical Approach, 1990-2013. The Unit root test conducted with the Augmented Dickey Fuller (ADF) Unit root revealed that the variables were stationary at first difference rate 1(1). The existence of long-run relationship between investments, inflation rate, government expenditure, exchange rate and Interest rate were established with the Johansen Co-integration test. The Pairwise granger causality shows causality running unidirectional from government expenditure to investment. The error correction model (ECM) indicated that short run disequilibrium in investments can be corrected at the speed of 67% per annum. These simply show that there is a significant relationship between the selected macroeconomic variables and level of investment in Nigeria. The studies recommend that only government expenditure has a significant influence on investment in Nigeria.

Agwu (2015), examined the determinant of investment in Nigeria: an econometrics analysis. The study used Autoregressive Distributed lag model (ARDL) in estimating the long-run and short-run coefficients of variables. in the longrun, it shows that past income level, capital investment, government size and interest rate are the major determinants of domestic investment

in Nigeria and these variables have a positive effective on private investment in Nigeria. Exchange rate and inflation have an insignificant effect on private investment in Nigeria and the researcher recommends the need to ensure policy consistence and reduce the level of interest rate so as to attract and improve the level of investment in the country.

Omoke and Ugwuanyi (2010) tested relationship between inflation, money supply and investment in Nigeria using Johansen Co-integration and Granger Causality test. The results suggest that price stability can contribute towards increased level of investment. The study found that major determinants of investment were monetary aggregates, real output, inflation and exchange rates. This study never considered the role government expenditure plays in the determination of investment level.

Patience and Osaro (2010),investigated the trade and dynamics of the determinants of investment in Nigeria. Using the cointegration technique, they found that past outcome of domestic investment strongly influence the present level of investment in Nigeria and the result show that market fundamentals do not encourage domestic investment.

Olusegun (2010), in his assessment of the role of government in explaining domestic investment in Nigeria found from the long run estimation and impulse response that a well structured and stable socio-economic environment will boost domestic investment over the long run.

Enang (2010) empirically assessed macroeconomic reforms, government size and investment behaviour in Nigeria and found that government size did not complement private investment initiative and that credit to the private sector was a significant factor in stimulating private investment in Nigeria.

Mouyiwa (2005) examined the linkage between inflation rate and investment using panel co-integration approach and a variance decomposition. The result of the study was a negative relationship between inflation rates and investment.

Chete and Akpokodji (1998) findings show that private investment in Nigeria is influenced by public investment, inflation rate, real exchange rate, and domestic credit to the private sector in addition to the private foreign capital inflow.

Obaseki and Onwioduokit (1998) assessed the relative contributions of the private and public sectors to long-run growth in Nigeria. The result showed that private investment, public investment and imports are important determinants of output growth in Nigeria. Their results further revealed that public and private investment were complementary in Nigeria; public investment contributed more to total output than private investment and public sector feeds the private sector. The assertion that public investment contributed more to total output in Nigeria than private investment was in order, considering long history of dominance of public sector, reliance of private sector on public sector for survival and the low level of private investment in Nigeria.

Iyoha (1998), in an attempt to identify and discuss the macroeconomic issues germane to rekindling investment for economic development in Nigeria, found that private investment in Nigeria depends significantly on public investment, return on investment, foreign exchange premium and a debt overhang variables. Stressing the critical role of uncertainty and external debt in depressing investment in Nigeria, he proffers ways to encourage private investment in Nigeria to include appropriate macroeconomic policies, reduction of uncertainty in the macroeconomic terrain, management of the debt overhang problem, deregulation of financial environment, openness and integration into the global economy, and reduction of social and political instability.

Ariyo and Raheem (1991) investigated the determinants of private investment and found that public investment, rate of GDP growth, domestic credit to private sector and interest rate impacted positively on private investment.

MODEL SPECIFICATION

This study is to identify the macroeconomic variables that determine investment and examine the relationship with respect to level of investment and nature of impacts. Time series data were obtained for the study covering the period of 1980 -2018. The said data were sourced via the Central Bank of Nigeria Statistical Bulletin 2018. Four determinants of investment were identified to estimate level of investment(s).

The statistical analysis used for data analysis was the E-view. The model specification used lies on the Ordinary Least Square (OLS) for multiple regression analysis. To ascertain the stationarity of the data, Augmented Dickey Fuller (ADF) Unit root test was conducted, Auto regressive distributed lag were employed to determine the existence of relationship.

The model were specified thus:

$$INV = \beta_0 + \beta_1 INF + \beta_2 EXR + \beta_3 INT + \beta_4 GEX + \epsilon_t$$

Where;

INV = Investment

INF = Inflation rate

EXR = Exchange rate

INT = Interest rate

GEX = Government Expenditure

$\beta_0 - \beta_4$ refers to the parameters to be estimated

ϵ_t = omitted variable

A priori expectation: ($\beta_1, \beta_2, \beta_4 < 0$) ($\beta_3 > 0$)

PRESENTATION OF RESULTS

Table 1: Result of the Unit Roots for Stationarity

VARIABLES	ADF Test Statistic		Order of Integration
	Level	First Difference	
INV	-1.39939	-0.253086	1(0)
INF	1.786341	-10.28576	1(1)
EXR	-1.027445	-6.57762	1(1)
GEX	0.67614	-6.84504	1(1)
INT	-1.651867	-5.559932	1(1)

Source: Author’s compilation using E-View 9.5 computer software

The variables were non stationary since their Augmented Dickey-Fuller (ADF) test statistics were less than their critical values in absolute value. This led to the differencing of non-stationary data to induce their stationarity, hence, the non-stationary variables became stationary after first difference and are therefore integrated of order one, 1(1). This indicates that all the variables are free from unit root problems and hence there is no need to suspect that the estimated results are spurious. However, given that the variables do not possess the same order of integration, as some are integrated of order zero while others are integrated of order one, the technique of Auto regressive distributed lag (ARDL) will be used to estimate both the short and long run relationship that exist among the specified variables.

Following the procedure developed by Perseran and Shin (1999) and Perseran, Shin and Smith (2001), the first step in an Auto regressive distributed lag (ARDL) model is the estimation of an unrestricted equation in the so called ARDL standard regression model. The ARDL standard regression is presented in table 2

TABLE 2: AUTO REGRESSIVE DISTRIBUTED LAG RESULT

Dependent Variable: INV
 Method: ARDL
 Date: 03/20/19 Time: 09:53
 Sample (adjusted): 1982 2018
 Included observations: 37 after adjustments
 Dependent lags: 1 (Fixed)
 Dynamic regressors (2 lags, fixed): INF EXR GEX INT
 Fixed regressors: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
INV(-1)	0.057914	0.234633	0.246829	0.8072
INF	-0.135881	0.113283	-1.199479	0.0426
INF(-1)	-0.307124	0.168975	-1.817574	0.0822
INF(-2)	0.294600	0.170119	1.731729	0.0967
EXR	-1.846079	0.666318	-2.770567	0.0109
EXR(-1)	-3.058626	1.027777	-2.975964	0.0068
EXR(-2)	0.747358	1.330363	0.561770	0.5797
GEX	0.602129	0.302214	1.992393	0.0583
GEX(-1)	0.095867	0.301177	0.318306	0.7531
GEX(-2)	0.259365	0.310063	0.836490	0.4115
INT	-0.328262	0.444361	-0.738729	0.0375
INT(-1)	0.496142	0.549344	0.903153	0.3758
INT(-2)	-0.344300	0.816952	-0.421445	0.6773
C	17.70375	27.88941	0.634784	0.5318
R-squared	0.730434	Mean dependent var		1.195516
Adjusted R-squared	0.578070	S.D. dependent var		16.85005
S.E. of regression	10.94514	Akaike info criterion		7.905000
Sum squared resid	2755.308	Schwarz criterion		8.514537
Log likelihood	-132.2425	Hannan-Quinn criter.		8.119891
F-statistic	4.794023	Durbin-Watson stat		1.850211
Prob(F-statistic)	0.000539			

*Note: p-values and any subsequent tests do not account for model selection.

Source: Author`s computation using Eview 9.5 computer software

TABLE 3: DIAGNOSTIC TEST

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.628205	Prob. F(2,26)	0.3191
Obs*R-squared	4.714181	Prob. Chi-Square(2)	0.1078

Source: Author`s computation using Eview 9.5 computer software

From the Breusch Godfrey test above, the Observed F-statistics is 1.628205 with p-value of 0.3191. Since its P-value is greater than the chosen level of significance (0.05), we therefore cannot reject the null hypothesis. Hence, we accept the null hypothesis of no autocorrelation in the estimated result. This implies that there is absence of autocorrelation in the model

TABLE 4: DIAGNOSTIC TEST

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.918111	Prob. F(8,28)	0.5164
Obs*R-squared	7.688829	Prob. Chi-Square(8)	0.4644
Scaled explained SS	3.632842	Prob. Chi-Square(8)	0.8886

Source: Author`s computation using Eview 9.5 computer software

From the result presented above, it can be seen that the F-statistics has a value of 0.918111 with a corresponding p-value of 0.5164. Since the P-value is greater than 0.05(the chosen level of significance), we accept the null hypothesis and conclude that there is no homoscedasticity in the model.

TABLE 5: BOUNDS TEST ESTIMATE

ARDL Bounds Test

Date: 03/20/19 Time: 11:26

Sample: 1982 2018

Included observations: 37

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	16.16533	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Author`s computation using Eview 9.5 computer software

Using the bounds testing methodology at 5 percent level of significance, the null hypothesis of no long run relationship is rejected since the value of the F-statistic (16.16533) is greater than the upper critical bounds value of (4.01). This implies acceptance of the alternative hypothesis

thereby concluding that there is presence of long run relationship among the variables used in the model.

DISCUSSION OF RESULT

The time series data were subjected to stationarity test using Augmented Dickey Fuller (ADF) Unit root. The ADF revealed that all the macroeconomic variables were stationary at first difference 1(1). However, given that the variables do not possess the same order of integration, as some are integrated of order zero while others are integrated of order one, the technique of Auto regressive distributed lag (ARDL) will be used to estimate both the short and long run relationship that exist among the specified variables.

In table 2 above, the R-Squared of 0.730434 (73.04%) is an indication of a strong relationship between the level of investments in Nigeria and the exogenous variables (Inflation, Exchange Rate, Government Expenditure and Interest Rates). The adjusted R. Squared = 0.578070 shows that the exogenous variables accounts for 57% changes in investments. This makes the model a good one. Auto-Correlation was tested using the Breusch Godfrey Serial Correlation LM Test and there was no autocorrelation in the estimated result.

Using the bounds testing methodology at 5 percent level of significance, the null hypothesis of no long run relationship is rejected since the value of the F-statistic (16.16533) is greater than the upper critical bounds value of (4.01). This implies acceptance of the alternative hypothesis thereby concluding that there is presence of long run relationship among the variables used in the model.

Table 2 above depicts the result of the ARDL test. The result shows that inflation rate (INF) at current period has negative and significant impact on investment in Nigeria. This claim is revealed by the coefficient and the p-value of INF. The coefficient of INF is -0.135881 while the P-value is 0.0426 which is below 5% critical value. Indeed, Inflation rate is expected theoretically to be negatively related to investment. This is due to the fact that as inflation rate increase, the value of economic activity reduces, performance drops and ultimately reduces investment.

Furthermore, the estimation results in the table 2 also indicated that exchange rate (EXR) at current period has negative and significant impact on investment in Nigeria. This claim is illustrated by the coefficient and the p-value of exchange rate (EXR). The coefficient of exchange rate is -1.846079 , while the p-value is 0.0109 which is less than the 5% level of significance. A higher level of exchange rate reduces investment in the sense that a devaluation of nation's currency means a fall in the real income of the economy. This reduces productive capacity, increases the real cost of purchasing imported capital goods, which will eventually lead to a decline in the level of investment. The model equation is in line with the above assertion.

Again, the estimation result in table 2 above indicated that government expenditure at current period has positive and insignificant impact on investment in Nigeria. This claim is also illustrated by the coefficient and the p-value of government expenditure (GEX). The coefficient of the government expenditure is 0.602129, while the p-value is 0.0583, which is greater than 5% level of significance.

The table 2 above also depict that interest rate at current period has negative and significant impact on investment in Nigeria. This claim is illustrated by the coefficient and p-value of interest rate (INT). The coefficient of interest rate (INT) is -0.328262 , while p-value is 0.0375 which is less than 5% level of significance. The effect of interest rate on investment is expected to be negative. This is because as the interest rate (lending rates) increases, it deters prospective investors, makes the cost of borrowing costly and the resultant outcome will be

decline/fall in level of investment undertaken. High interest rates discourages the tendency to borrow. This is because despite all efforts to encourage investment, the interest rate has continued to remain high in Nigeria.

CONCLUSION AND RECOMMENDATION

The empirical analysis was based on the time series data for Nigeria over the period 1980-2018. The data was collected from Central Bank of Nigeria Annual Abstracts and various issues of Economic survey. All the regression equations are estimated by the ordinary least square technique. The results for this study provide some support for the hypothesis that the rates of private investment are affected by important macro-economic variables. The econometric tests undertaken support the view that inflation rate, exchange rate, government expenditure and interest rate have all been significant determinants of private investment. The empirical evidence suggests that interest rate is inversely related to private investment but it is significant. This is consistent with the empirical evidence that when interest rate rises, cost of borrowing increases so, there will be a decline in future profits. As a result, the stimulus to invest is discouraged. The result provides evidence that a higher level of exchange rate reduces productive capacity, increases the real cost of purchasing imported capital goods, which will eventually lead to a decline in the level of investment. The model equation is in line with the above assertion.

The result also provides empirical evidence that inflation is negatively related to investment. This is due to the fact that as inflation rate increases, the value of economic activity reduces, performance drops and ultimately reduces investment. Again the result also suggests that government expenditure is positively related to private investment. This is because government expenditure creates aggregate demand and it is an essential ingredient in boosting investment in Nigeria.

It is very important for Nigerian Government to review its policies on Private Investment and pay more attention to its determinants i.e Interest Rate (INT), Exchange Rate (EXR), Inflation Rate (INF) and Government expenditure (GEX) as they are the essential ingredients for boosting Private Investment in Nigeria. Government needs to focus on the overall institutional framework of private investment in Nigeria in order to facilitate growth and development in the country. Additionally, curbing inflation will go a long way through the increase in output which depends majorly on infrastructures is also recommended. i.e. Government should invest some of its available resources in the provision of infrastructures which will increase output, reduce inflation, interest rate, and increase private investment ultimately. Interest rate should not be left in the hands of the forces of demand and supply but should be fixed at a very reasonable rate in order to encourage private investment in Nigeria. More so, government should direct its effort in assisting private sector on increasing spending on basic infrastructure which will go a long way in boosting private investment in Nigeria. Bottom line is that, it is strongly recommended that government should make Nigerian economy a conducive environment for private investment as a matter of high national priority by putting in place policies through practical strategies that will ensure consistent, moderate and acceptable levels of inflation rate, interest rate, exchange rate and increase in government expenditure on basic infrastructure in the Nigeria economy.

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