Effect of Selected Macroeconomic Variables on Aggregate Investments in Nigeria

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ABSTRACT

This study investigated the influence of selected macroeconomic variables such as exchange rate, interest rate, and inflation rate on aggregate investment in Nigeria. Using gross fixed capital formation (GFCF) as an indicator for the measure of investment performances, the study used annual time series data which were mainly obtained from the CBN statistical bulletin. The autoregressive distributed lag (ARDL) technique was employed in this study to estimate the relationship among the variables in short run and long run. According to the bounds test, the result showed that there existed a long run cointegration relationship between the selected macroeconomic variables and aggregate investment in Nigeria. It is found that the exchange rate had positive and significant effects on investment. This means that a stable exchange rate would promote investments. On the contrary, the lending rate was found to have negative and significant effects on investment, which means that when borrowing cost is high, then investment will be discouraged. Also, inflation has a slight positive effect on investments. From the error correction model, there was evidence to show that the deviations from the equilibrium process is corrected to some degree along the long-run equilibrium path with the error correction parameter having a value of –0.63. The diagnostic test results revealed no presence of serial correlation and heteroskedasticity. On this basis, therefore, the study infers that macroeconomic stability such as exchange rate stability, moderate interest rate, and low inflation rates are essential for promoting aggregate investments in Nigeria.

Keywords: Aggregate Investments, Nigeria, Inflation, Interest Rates, Exchange rates

INTRODUCTION

Investment will continue to be a key motivator for Sustainable Development Goals (SDGs) because of its importance as a principal engine for economic growth, poverty alleviation, and job creation in both developed and developing nations. Especially when it comes to investments in the aggregate within the economy, such investments will help boost productive capabilities, facilitate technological dissemination, and increase the likelihood of sustained growth. In today's world of growing economic integration, the challenge will always remain for economies to reconcile the benefits of globalization with those of maintaining their productive structures. The development performance of such economies has been influenced by the dynamics between savings, investment, and growth within emerging economies (Romer, 2019; IMF, 2023). The inflation rate has been found to negatively impact real output growth and dissuade investments due to the increased risks and lower real income. According to the World Bank (2024), savings and investments within developing nations, such as Nigeria, have been insufficient to support the level of growth necessary for an improvement in welfare and SDG targets.

Both the public and private sectors must continue to be equally important for guiding the direction of development in the nation. The early literature on development stressed the importance of the amount of investment a country undertakes for its overall economic performance and growth rate (Nugent & Yotopoulos, 1979). Examples of success in the developing world illustrate that the intensity of private business activity is related to economic growth. Empirical research confirms that private investments have a more direct correlation with economic growth than public investments in several developing nations (Khan & Reinhart, 1990; IMF, 2023). According to Obaseki and Onwioduokit (1998), the common view in Nigeria is that increased involvement of the private sector is necessary to boost growth and development. International organizations have

continued to assist private sector development in Africa, including Nigeria, using measures such as investment guarantees and provision of technical assistance, among others. International organizations like the International Finance Corporation have extended their programs focusing on making the investment environment favourable for mobilizing private capital (IFC, 2023).

Under this premise, this research endeavours to critically examine how a set of macroeconomic determinants, including interest rate, inflation rate, government spending, foreign direct investment, and exchange rate, influence the total investments in Nigeria. The empirical evidence generated from the research shall be useful in informing policymaking efforts toward the development of sound macroeconomic and investment policies for achieving the SDGs in Nigeria.

Aim and Objectives of the Study

The aim of this study is to examine the effects of selected macroeconomic variables, namely inflation, interest rate, and exchange rate, on aggregate investment in Nigeria.

The specific objectives are to:

i. Examine the effect of inflation on aggregate investment in Nigeria.

ii. Assess the effect of interest rate on aggregate investment in Nigeria.

iii. Evaluate the effect of exchange rate on aggregate investment in Nigeria.

LITERATURE REVIEW

Theoretical Framework: The Accelerator Theory of Investment

The Accelerator Theory of Investment is an important concept in macroeconomic theory, which explains the connection between changes in the economy's output and the investments carried out by companies. Developed during the early part of the 20th century by Richard Kahn (Khan, 1931) and Alvin Hansen (Hansen, 1951), the Accelerator Theory of Investment argues that investment rates have their foundations in changes in demand for goods and services. According to the theory, the accelerator model demonstrates that when demand increases, firms are motivated to invest more capital in order to respond to the demand. On the other hand, if demand falls, firms are forced to evaluate their production abilities and consequently reduce their investments.

The Accelerator Theory of Investment offers an attractive model for understanding the complex linkages that exist between the variations in demand and investment. The emphasis placed by the theory on the correlation between output growth and capital formation enables one to appreciate the cyclical aspect of investments in the economy. Although the theory has its weaknesses, it cannot be overlooked when discussing various investment theories, due to the importance of the accelerator effect in economics.

Empirical Review

Considering the dynamic interactions between investments and macroeconomic indicators, several studies have been carried out to empirically examine the relationship between investment and selected macroeconomic indicators.

Isaac & Akpan (2024) focus on the macroeconomic determinants of domestic investments in Nigeria, based on yearly data covering the years between 1982 and 2020, within the scope of existing theoretical models on investments. Specifically, ARDL modelling is used to establish both short- and long-term links between investments and the macroeconomic factors in the form of interest rate, output, savings, government expenditure, money supply, stock markets, and inflation. According to the authors' findings, short-term links are observed only for the government expenditure, money supply, and inflation factors, while long-term relationships are significant for all the macroeconomic factors mentioned above excluding interest rate. This observation implies that the interest rate does not play an important role as the main factor of investment dynamics in Nigeria. The

study conclusions coincide with several economic theories which confirm the importance of the government policies in the process of shaping investment dynamics. In particular, the study highlights the policy-driven nature of the investigated macroeconomic determinants. Hence, the identified results suggest that governmental measures can effectively encourage domestic investments in Nigeria due to the greater participation of businesses in government initiatives. Overall, Isaac and Akpan's research contributes valuable insights into the relationship between macroeconomic variables and investment in Nigeria, reinforcing the idea that effective policy measures can play a pivotal role in fostering a conducive investment environment.

Immanuel (2024) evaluates the role played by macroeconomic variables in portfolio investment within the ASEAN-5 group consisting of Indonesia, Malaysia, Philippines, Thailand, and Vietnam. Using the secondary data provided by central banks and financial websites as well as employing a quantitative methodology, he identifies some important variables including the interest rate, exchange rate, and inflation rate. In particular, he finds that while the interest rate and the exchange rate play immediate roles in the investment decision-making process, inflation rate and money supply are important in the long run. Such an important finding must be kept in mind by the investors while developing the strategy for investments. Moreover, the findings of Immanuel reiterate the role played by the right monetary policy for stabilizing capital flow and attracting investments, which is well-supported by the literature. Finally, the recommendations made by Immanuel regarding exchange rate stability and open economy by ASEAN-5 governments are supported by the available literature. The updated studies reinforce the role played by such macroeconomic variables and indicate that there remains a need for research in this regard.

The study carried out by Obinna and Daniel (2022) on the effect of inflation on the investments in Federal Government Securities by pension funds in Nigeria was based on time series analysis in the period between 2007 and 2019. Unit root analysis was carried out in the study through the application of Augmented Dickey Fuller test while Ordinary Least Squares method was used in testing hypothesis. The result revealed that there is no significant effect of inflation rate on pension fund investments in Federal Government Securities in Nigeria. This suggests that pension fund investments in Federal Government Securities generate profits which help investors to cope with the effects of inflation. This could be attributed to the fact that monthly contributions into Federal Government Securities have offset the effect of inflation on pension fund investments in Federal Government Securities in Nigeria. As shown from the results of the study, it can be concluded that there is no significant effect of inflation on pension fund investments in Federal Government Securities in Nigeria. From the results obtained in the study, it is recommended that the Nigerian Pension Industry should lobby policy makers to lower the monetary policy rate and stabilize the value of Naira in order to improve the value of pension funds. While the study was done on pension funds in Nigeria, the researchers failed to consider interest rates and exchange rates, which this research tries to cover.

The research by Toby et' al (2020) was aimed at examining the impact of inflation on the decisions of companies related to dividend policy and investments in Nigeria. In this case, time series and panel data models were used in conducting the study whose main aim was to determine the effect of core, food, and headline inflation rates on the decision-making process of the 21 publicly quoted firms in different industries within the Nigerian economic sector. The ARDL technique was used in conducting the time series analysis and was based on annual data between 1981 and 2016. On the other hand, for the panel data model, there were three commonly used methods of analysis; namely Pooled Least Squares, Fixed Effects, and Random Effects. There were 210 observations based on 10 years (between 2007 and 2016) of data collected for the 21 firms. There was shown a negative relationship between inflation and the decision making about dividend using dividend yield. Moreover, it was found that all types of inflation were positively correlated with the companies' investment decisions as measured by the investment cash flows. Conclusion From this study, it has been identified that inflation has an important role in the decision-making process related to dividends and investment of the quoted companies. It is recommended that dividends must be paid by the company due to the problem of asymmetric information existing between managers and owners. It is also recommended that companies should invest their money in profitable assets through the use of appropriate discounting techniques considering inflation rates. The authors of this study could not show the impact of inflation on interest rate and exchange rate. This resulted into the gap addressed in the current study.

According to Mogaji, Falade, Ogundipe and Stephe (2020) sought to establish the link between inflation, interest rates, and domestic investments in Nigeria from 1986 to 2018. To achieve this, initially the study relied on the Augmented Dickey Fuller (ADF) and Phillip Peron (PP) unit root test, and Johansen Co-integration test. After this, the Auto Regressive Distributed Lag (ARDL) test was applied. Findings from the ADF and PP unit root test confirmed that there was stability in all the variables at both levels 0 and 1. The result of the Johansen Co-integration test also shows the existence of two co-integrating equations with a 5% significance level. By applying the ARDL model, the past performance of domestic investment and the inflation rate positively affected the domestic investment, accounting for 82.9% and 13.7% respectively. On the other hand, the interest rate and government expenditure exhibited negative influences, resulting in reductions in domestic investment of 61.1% and 28.6%, respectively. In summary, the findings of this study reveal that past performance in domestic investments in combination with gradual increases in the general level of prices positively influences domestic investments. However, deficiencies in government expenditures and the sudden increase in interest rates negatively affect domestic investments. Some of the key recommendations include developing government policies that encourage local investors, which can be attained through increased funding towards infrastructure development for favourable economic conditions. Another recommendation includes the need for frequent reform in the rate of interest to reduce the disparity between lending and deposit interest rates. The identified gap in this study is that the authors did not address how inflation or other factors like interest rate and exchange rate were addressed in this study.

According to Pettinger (2019), the reason for the volatility of domestic investment is the fact that domestic investment is dependent on different elements like interest rate, exchange rate, savings, government policy, inflation, and other similar factors. These factors play a vital part in influencing the GDP fluctuation cycle and are critical to the growth of a country's economy. Nigeria is a low-savings economy with reduced investment levels. One of the goals of the government is the growth in economic development through increasing domestic investment. The author agrees that there are different factors that affect domestic investment. However, the author mentioned how the factor of inflation affects domestic investment.

According to Green et'al (2019), the impacts of various macroeconomic variables and policies were estimated in developing economies like Nigeria. They found out that the private investment G.D.P ratio had positive correlation with real GDP growth level of per capital GDP and public sector investment rate whereas the real interest rate, domestic inflation, and debt servicing ratio had negative correlation with the investment ratio. The author identified the factors influencing investments in Nigeria but did not consider the role of exchange rate in investment, thus creating a gap that this research seeks to fill.

Ramasamy (2019) conducted a study on the theoretical and empirical determinants of gross investments in developing countries like financial depression, lack of infrastructure, economic instability, and aggregate demand levels where shortage of foreign exchange relative factor and credit availability emerged as significant variables influencing investments. However, the author failed to establish the impact of inflation on interest rate, thereby creating a research gap that this study aims at filling.

Osasu and Sadiq (2019) analysed the use of taxation as one of the methods for dealing with inflation problems in Nigeria. The data used for this research was gotten from the Annual Abstract from the Office of National Bureau of Statistics and Office of Federal Inland Revenue Service for the period of 20 years ranging from 1994 to 2014. The data collected was analysed using error correction model (ECM) and the paper found out that the independent variables which include companies' income tax, value added tax and custom and excise duties had positive and non-significant relationship with the dependent variable which is inflation. The paper concluded by recommending that the government and policymakers should put in place a sound tax policy in order to deal with the problem of inflation in Nigeria and also analyse those periods when Nigeria experienced low inflation rates with regards to the role of taxation in maintaining low inflation rates. The authors did not mention how inflation had impacted on investment especially domestic investment and this study intends to close that gap using domestic investment, interest rate and exchange rate.

Islam & Wetzel (2019) conducted research that sought to empirically examine the relationship between real private investments and other factors including real public investments, credit to the private sector, real interest rates, and a dummy for 1976 in Ghana. Real public investments were shown to crowd into private investments,

while real interest rates were seen not to have any significant impact on private investments. This study does not consider the exchange rate among others that form part of this study's variables intended to fill the gap.

Fashagba, et'al (2019) carried out research on the impact of inflation on return on investment in Nigeria. Secondary sources were used in this research on inflation rate and interest rate in Nigeria from 1998 to 2017 for 20 years. Method used in the analysis of data in this study is t-test and ANOVA. This study revealed that the inflation rate is relatively high, leading to negative return on investment; hence, the relationship between the inflation rate and the return on investment is highly volatile. Rate of return on investment plays a very vital role in investment activities. Investors invest in projects that offer the maximum expected return on investment. The difference between the nominal return on investment and the inflation rate is the real return on investment. This study aims to identify the impact of inflation on return on investment in Nigeria. This study recommends strict control measures for the inflation rate in order to make investments secure and achieve stable economic growth. The authors did not explain how inflation affects the interest rate and exchange rate, creating a gap for this study.

Austin, et'al (2019) performed research titled "Inflation and Nigerian investment growth: Engle-granger two step modelling approach". The study makes use of time series data spanning the period of 1980-2015. The data were obtained from the World Economic Outlook (WEO) database of the IMF and World Development Indicators (WDI). The research uses Engle-Granger two step modelling (EGM) method for co-integration through unrestricted Error Correction Model and Pair wise Granger Causality tests. According to the results, it can be noted that there is co-integration between inflation and gross fixed capital formation in this research. The value of error correction term (-0.76) is negative and significantly different from zero at all conventional levels of significance. It means that whenever the variables deviate from their equilibrium position due to exogenous shocks, 76 percent imbalance will be corrected within a year. Consequently, based on the research results, one can conclude that the policy recommendations to curb inflation are that the government must put in place various policies, both monetary and fiscal, to reduce inflation to an acceptable level since the current level of inflation in Nigeria is negatively impacting creativity and production of products that have international competitiveness.

Maku and Adelowokan (2019) examined inflation and its influence on government expenditure using the linear regression model. The results indicate that inflation is detrimental to economic growth because it lowers the standard of living and affects economic decisions. Furthermore, an increase in prices in one economic area might affect the prices in another part of the economy. Deflation has adverse economic effects like inflation when it is high. Thus, the optimal level of inflation is low and stable levels of inflation ranging between 0 percent and 3 percent. However, their research did not establish the relationship between inflation and investment.

According to Oyedokun and Ajose (2019), the domestic investment in Nigeria is lower than in nations within the BRICS cluster (Brazil, Russia, India, China, and South Africa). Although several strategies were adopted, including protection and tax cuts to encourage nascent industries, credit availability for industrial and agriculture businesses, and interest rate controls, the effects have not been what was anticipated because the nation has not recorded a considerable increase in domestic investments. The problem of inadequate domestic investment and capital formation in Nigeria has led to problems such as unemployment, underemployment, poor government earnings, poverty, and insecurity.

Onyemaechi and Raji (2019) conducted a study on the negative consequences of inflationary pressures on corporate investment, focusing specifically on the West-African monetary zone (WAMZ). The analysis adopted the Cobb-Douglas production framework and the following results emerged from the analysis: Firstly, there is a positive correlation between inflation and corporate investment in the long run, and there is a negative correlation between inflation and corporate investment in the short run; Secondly, there are no statistically significant influences of the dynamics of real interest rates, government expenditure, and the relative price of capital goods on the quantity and rate of corporate investment in the sampled countries of the West-African monetary zone in the short run. Third, the economic growth rates of the West-African monetary zone seem to have economic effects contrary to theoretical expectations. Onyemaechi and Raji (2019) identified the pressures of inflation on corporate investment but did not investigate how such an inflation impact interest rates and exchange rates. This study intends to fill this gap.

Omoke et'al in (2018) applied co-integration and Granger causality analysis to analyse the interrelation among money supply, inflation, and output. The results indicate the non-existence of co-integrating vectors in the data set. Money supply was found to be the reason behind both output and inflation Granger causality. The implication of this is that monetary policy stability can help maintain price stability within the Nigerian economy because the major source of price level fluctuation comes from money supply. The study concluded that inflation in Nigeria is to a great extent a monetary issue. They provided some empirical evidence to support the money-price-output hypothesis for the Nigerian economy. M2 was found to have a significant impact on the real output and prices. In Okun's Law, each percentage point of cyclical unemployment causes a loss equivalent to 2% of full-employment output; if the full-employment output is $10 trillion, each percentage point of unemployment sustained for one year is worth $200 billion.

METHODOLOGY

Research Design

This study adopted an ex-post facto research design, given that it relied exclusively on secondary data and did not involve any manipulation of the study variables. The ex-post facto design is appropriate for this study as it enables the examination of relationships among macroeconomic variables using historical data that already exist.

Model Specification

The model used in this study was modified from Maku and Adelowokan's (2019) research. Therefore, based on his model which was adapted for this study with the inclusion of few policy variables lacking in the study and in the literature, the functional specification of the model for this study is specified thus:

GFCF = (INF, LR, EXR) ---------- (1)

Equation (1) is the functional specification of the model

Where;

GFCF = Gross Fixed Capital Formation

INF = Inflation

LR = Interest Rate

EXR = Exchange Rate

Further specifying the model in the econometric form in stochastic form equation (1) becomes:

$GFCF = a_0 + a_1INF + a_2 LR + a_3EXR + U_t$ ……(2)

$a_1 < 0, a_2 < 0, a_3 > 0$

Where:

a_0 = the intercept of the regression line

a_1, a_2 and a_3 = the partial slope coefficients of the regression model

U_t = error term or stochastic element

To capture the dynamic relationship among the variables, the ARDL model is specified as:

$$\Delta GFCF_t = \alpha_0 + \sum_{i=1}^{p} \beta_i \Delta GFCF_{t-i} + \sum_{i=0}^{q} \gamma_i \Delta INF_{t-i} + \sum_{i=0}^{r} \delta_i \Delta LR_{t-i} + \sum_{i=0}^{s} \theta_i \Delta EXR_{t-i} + \lambda_1 GFCF_{t-1} + \lambda_2 INF_{t-1} + \lambda_3 LR_{t-1} + \lambda_4 EXR_{t-1} + \varepsilon_t \quad \ldots\ldots (3)$$

Where:

Δ= First difference operator

t= Time period

p, q, r, s= Optimal lag lengths

α_0= Constant term

ε_t= Error term

$\lambda_1 - \lambda_4$= Long-run coefficients of the model

The ARDL approach was adopted because it accommodates variables integrated of order zero I(0) and order one I(1), and it is suitable for small sample sizes while simultaneously estimating both short-run and long-run dynamics among the variables.

Nature and Sources of Data

This study utilised secondary time series data to empirically investigate the effect of macroeconomic variables on investment in Nigeria, based on data covering the period 1990 to 2023. The data on Inflation, interest rate, exchange rate and aggregate investment were sourced from the statistical bulletin of the Central Bank of Nigeria.

Estimation Techniques

This study is analysed the effect of inflation on government expenditure in Nigeria economy. The Autoregressive Distributed Lag Model (ARDL) is used. The choice of the ARDL for the study is guided by the fact that its computational procedure is simple and the estimates obtained from this procedure have optimal properties.

DATA ANALYSIS AND DISCUSSION OF FINDINGS

Unit Root Tests

To ensure the robustness of the econometric analysis and to avoid spurious regression results, it is essential to examine the stationarity properties of the data. The Augmented Dickey-Fuller (ADF) test was employed to determine the order of integration of the variables used in the study. The results of the unit root tests at both level and first difference are presented in Table 4.1

Table 4.1. Augmented-Dickey Fuller Test

At Level			**At First Difference**		
	t-statistic	**P-value**	**t-stat**	**P-value**	**Order of Int.**
INF	-2.958291	0.0495	-	-	I(0)
LR	-2.506886	0.1230	-7.076893	0.0000	I(1)
EXR	-7.625177	0.0000	-	-	I(0)
GFCF	-2.954021	0.7370	-4.206659	0.0025	I(1)
Significance level is 5%					

Source: Computed by author using Eviews 10

Table 4.1 presents the results of the Augmented Dickey-Fuller (ADF) unit root test used to determine the stationarity of the variables in the model. The unit root test examines whether each variable in the dataset is stable over time or exhibits a tendency to drift, which could distort the results of time series analysis. At a 5% significance level, the results reveal that the inflation rate (INF) is stationary at its level form, as indicated by its t-statistic of –2.958291 and a p-value of 0.0495, which is below the 0.05 threshold. This means inflation does not show long-term fluctuations and remains relatively stable over time. The variables exhibit a mixed order of integration—some are stationary at level (INF and EXR), while others are stationary at first difference (LR and GFCF). This combination justifies the use of the Autoregressive Distributed Lag (ARDL) model, which effectively handles variables that are a mix of I(0) and I(1).

Cointegration Test

To ascertain the existence of a long-run equilibrium relationship among the variables, the study employed the Bounds Testing approach to cointegration proposed by Pesaran, Shin, and Smith (2001). This method is particularly suitable given that the variables are integrated at mixed orders, i.e., I(0) and I(1), but none at I(2). The results of the bounds test are presented in Table 4.2.

Table 4.2: Cointegration Test using Bounds Testing

F-Statistic	**Level of Sig.**	**I(0)**	**I(1)**
6.235452	10%	2.72	3.77
	5%	3.23	4.35
	2.5%	3.69	4.89
	1%	4.29	5.61

Source: Author's Computation using STATA 17

The result of the ARDL bounds test for cointegration is presented in Table 4.2. The ARDL bounds test of cointegration was conducted to examine the long-run relationship between aggregate investment, proxied by Gross Fixed Capital Formation (GFCF), and selected macroeconomic variables, namely inflation rate (INF), exchange rate (EXR), and lending rate (LR) in Nigeria. The computed F-statistic value is 6.235452, which is compared against the critical value bounds at different significance levels. At the 5% significance level, the lower and upper bound critical values are 3.23 and 4.35, respectively. Since the calculated F-statistic (6.235452) is greater than the upper bound critical value (4.35), the null hypothesis of no long-run relationship among the variables is rejected. This result confirms the existence of a long-run cointegrating relationship between GFCF and the selected macroeconomic variables (INF, EXR, and LR).

ARDL Long-Run Estimates Interpretation

Following the confirmation of a long-run relationship among the variables using the Bounds testing approach, the ARDL model was estimated to obtain the long-run coefficients. This estimation provides insights into how each independent variables (inflation rate (INF), exchange rate (EXR), and lending rate (LR)) affects the dependent variable (GFCF) in the long term. The ARDL long-run results are presented below:

Table 4.3: Long-Run Coefficients from ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EXR)	1.356876	0.207718	6.532313	0.0000

LR	-0.149112	0.028005	-5.324377	0.0002
INF	0.052731	0.018337	2.875650	0.0139
C	4.662716	1.542654	3.022530	0.0106

Source: Computed by author using Eviews 10

The results of the ARDL long-run estimates reveal significant relationships between the selected macroeconomic variables and aggregate investment (proxied by gross fixed capital formation) in Nigeria. The coefficient of the exchange rate (LOG(EXR)) is positive and statistically significant at the 1% level (β = 1.356876, p = 0.0000), indicating that a 1% increase in the exchange rate (naira depreciation) is associated with approximately a 1.36% increase in aggregate investment. This suggests that, in the long run, a higher exchange rate may stimulate investment, possibly due to increased export competitiveness or substitution of domestic production for imports.

The lending rate (LR) exhibits a negative and highly significant effect on investment (β = -0.149112, p = 0.0002). This implies that an increase in the lending rate by one unit leads to about a 0.15% decrease in gross fixed capital formation, confirming that high borrowing costs discourage investment activities in the economy.

Similarly, the coefficient of inflation (INF) is positive and statistically significant (β = 0.052731, p = 0.0139), suggesting that moderate inflation may stimulate investment by enhancing firms' profitability expectations or signalling increased economic activity. However, this effect is relatively small compared to the impact of the exchange and lending rates. Overall, the findings imply that in the long run, exchange rate depreciation and mild inflation positively influence investment, while higher lending rates have a constraining effect on aggregate investment in Nigeria.

ARDL Error Correction Model Interpretation

Table 4.4: ARDL Error Correction Model Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(GFCF(-1))	0.003178	0.238567	0.013321	0.9896
DLOG(GFCF(-2))	-0.478378	0.220140	-2.173059	0.0505
DLOG(GFCF(-3))	-0.288927	0.273913	-1.054813	0.3123
DLOG(EXR)	0.043836	0.166051	0.263993	0.7963
DLOG(EXR(-1))	-0.149496	0.126656	-1.180336	0.2607
DLOG(EXR(-2))	-0.148814	0.099448	-1.496392	0.1604
D(LR)	-0.052801	0.022394	-2.357789	0.0362
D(LR(-1))	-0.002570	0.017329	-0.148306	0.8846
D(LR(-2))	0.038667	0.016625	2.325846	0.0384
D(INF)	0.007002	0.004407	1.588952	0.1381
D(INF)	0.002619	0.003167	0.827041	0.4244
D(INF)	-0.005972	0.003696	-1.615732	0.1321

D(INF)	-0.012973	0.005845	-2.219516	0.0465
CointEq(-1)	-0.630998	0.253372	-2.490400	0.0284
Source: Computed by author using Eviews 10				

Source: Computed by author using Eviews 10

The ARDL Error Correction Model (ECM) estimates presented in Table 4.4 provide insights into both the short-run dynamics and the speed of adjustment toward long-run equilibrium for the relationship between aggregate investment (GFCF) and the selected macroeconomic variables namely exchange rate (EXR), lending rate (LR), and inflation rate (INF).

The error correction term, $\mathrm{CointEq}(-1)$, is negative and statistically significant (β = -0.630998, p = 0.0284). This confirms the existence of a stable long-run equilibrium relationship among the variables. The coefficient magnitude (-0.63) implies that about 63% of short-run disequilibrium is corrected each period (typically annually if the data are annual). This relatively high speed of adjustment suggests that the system quickly returns to its long-run equilibrium after short-run shocks. Essentially, short-run investment responds significantly to changes in lending rates and, to a lesser extent, inflation. Exchange rate changes have no immediate short-run impact. The significant and negative error correction term validates a long-run equilibrium relationship, with rapid adjustment toward stability following short-run disturbances.

Findings

Exchange rate has a significant positive effect on aggregate investments in Nigeria. This implies that exchange rate movements, particularly depreciation, play a vital role in influencing investment levels, possibly by encouraging domestic production and enhancing competitiveness.

Interest rates have a significant negative effect on aggregate investments in Nigeria. This result suggests that reducing lending rates could stimulate investment by making credit more affordable for investors and businesses.

Inflation has a significant positive effect on aggregate investment in Nigeria. This result suggests that controlled inflation, within tolerable limits, can be beneficial for investment growth, while excessive inflation could have destabilizing effects on the investment climate.

DISCUSSION OF FINDINGS

The findings suggest that the exchange rate and inflation have a positive influence on investment in Nigeria, while high interest rates have a negative effect. To promote investment, the government and monetary authorities should focus on maintaining exchange rate stability, keeping inflation at a moderate level, and reducing lending rates to encourage borrowing for productive purposes. These measures can help boost investor confidence, increase capital formation, and promote sustainable economic growth in Nigeria. The findings of this study, which examined the impact of inflation, interest rate, and exchange rate on aggregate investment in Nigeria, align with several previous empirical studies that have explored the determinants of investment in developing economies.

The positive long-run relationship observed between exchange rate and investment is consistent with the findings of Isaac and Akpan (2024), who reported that exchange rate stability promotes investor confidence and encourages capital formation in Nigeria. Similarly, Immanuel (2024) found that moderate depreciation of the exchange rate can enhance export competitiveness and attract investment inflows, provided the macroeconomic environment remains stable. However, this study differs from Obinna and Daniel (2022), who found that excessive volatility in the exchange rate discourages investment by increasing uncertainty and transaction costs. This divergence may be attributed to differences in sample periods and the magnitude of exchange rate fluctuations during the study periods.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The objective of this research is to empirically analyse the effects of three major macroeconomic variables; namely, exchange rate, interest rate, and inflation, on aggregate investment in Nigeria, employing time series analysis method and estimating model using the Autoregressive Distributed Lag model (ARDL). The results show that these variables collectively have a significant effect on investment dynamics and thereby establish that macroeconomic stability is an important determinant of investment performance in Nigeria.

The evidence of cointegration among the variables shows that policies related to exchange rate management, monetary policy, and inflation rate will always have a bearing on investment. The result showing a positive long-run effect of exchange rate implies that having a stable exchange rate improves investor confidence and consequently fosters investment growth. On the other hand, the negative long-run effect of interest rate implies that a high cost of capital discourages investment in Nigeria.

Recommendations

Based on the findings of this study, the following policy actions are recommended to boost investment growth in Nigeria.

1. The results of the study indicated that the stability and predictability of exchange rate are important. Hence, the Central bank of Nigeria (CBN) should take initiatives aimed at building up foreign reserves, diversifying exports, and keeping foreign exchange market free from fraud.

2. High interest rate has a long run negative effect on investments; especially discouraging the investments of small and medium enterprises which are essential for economic growth. Therefore, interest rate should be properly controlled by the CBN in order to foster and investment-friendly macroeconomic environment.

3. Considering the long run results of this study indicating that moderate inflation stimulates investments, the central bank of Nigeria should sustain its inflation targeting policy stance, with a view to moderating inflationary pressures and promoting sustained investments.

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