

Monetary Policy and Aggregate Investment Expenditure in Nigeria

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Abstract

The correlation between Nigeria's monetary policy and the country's total investment spending is the focus of this research. It zeroes in on how the money supply and monetary policy rate influence Nigeria's total investment spending. The study made use of yearly time series data that extends from 1978 all the way up to 2023. One method that was used to analyse the data was Ordinary Least Square (OLS). Researchers discovered that total investment spending was positively and significantly affected by changes in the money supply. Additionally, aggregate investment expenditure was discovered to be negatively and statistically significantly affected by the monetary policy rate. The results also demonstrated that total savings affected aggregate investment expenditure positively and significantly, but real GDP had no effect on the latter yet was positive nonetheless. There was a negative and statistically significant relationship between the population growth rate and aggregate investment spending. To cut borrowing costs and encourage higher investment in the economy, the Central Bank should implement a more accommodating interest rate policy by gradually reducing the monetary policy rate. Lowered bank reserve requirements and sufficient financial system liquidity are two components of a well-managed expansionary monetary policy that the Central Bank should employ to increase access to credit and encourage investment.

Keywords: *Aggregate, Investment, Monetary, Money Supply, National Savings*

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Background to the Study

To control economic activity, maintain price stability, and encourage long-term growth, monetary policy is an essential tool for governments and central banks. Interest rate adjustments, open market operations, cash reserve requirements, and credit rationing are some of the monetary policy tools used by the Central Bank of Nigeria (CBN) to impact liquidity, credit availability, and the country's economic performance as a whole. Key macroeconomic metrics like employment, inflation, exchange rates, and investment spending are commonly used to measure the success of these programs.

Investment spending, which includes monetary and physical assets invested by both the public and private sectors, is crucial to Nigeria's economy. Productive capacity, technical advancement, and economic growth over the long run are all heavily influenced by investment. But issues including high inflation, fluctuating interest rates, poor policy implementation, and macroeconomic instability have made Nigeria's investment landscape unpredictable. Thus, in order to establish policies that can encourage economic growth and draw in investment from inside and outside, it is essential to comprehend the connection between monetary policy and investment expenditure.

Monetary policy interventions in Nigeria have been substantial during the last several decades, with the goals of reducing inflation, controlling the money supply, and improving the flow of credit to productive areas of the economy. Some research suggests that private investment could be stifled by a rise in the cost of capital due to stricter monetary policy (i.e., higher interest rates), while other research suggests that well-planned monetary policy can boost capital formation by boosting investor confidence. To add insult to injury, the oil-driven Nigerian economy is quite vulnerable to outside shocks, thus the country frequently employs counter-cyclical monetary policies to keep investment stable.

There is conflicting empirical data about the impact of monetary policy on aggregate investment expenditure in Nigeria, despite the fact that it is important to economic management. While some research shows that monetary growth promotes investment, other studies show that inflationary pressures and high interest rates discourage investment. Because of this lack of clarity, a thorough study is required to determine the impact of monetary policy decisions on investment expenditure in Nigeria, considering the country's specific structural and macroeconomic features. Analysing the relationship between monetary policy and aggregate investment spending is crucial since investment is a key component of economic growth, job creation, and industrial development. Researchers like this help policymakers in Nigeria create monetary interventions that attract investment, keep the economy stable, and advance long-term goals like sustainable development.

Statement of the Problem

Nigeria maintains its policies and programs to encourage domestic investment because it understands the critical role that investment plays in every economy. Despite the government's best efforts over many years to boost aggregate investment, Nigeria's investment climate remains precarious, mostly as a result of monetary policy mistakes that have unsettled

both domestic and international investors. Borrowing money has become costlier for companies due to the CBN's long-term policy of maintaining high interest rates. Investments, especially in SMEs and long-term initiatives, have been dampened by the high cost of borrowing money. The restricted availability of finance limits the expansion aspirations of investors, particularly those in the real industry. Businesses in the agricultural and manufacturing sectors have been discouraged from making long-term investments because of the frequent shifts in monetary policy, such as unexpected changes to the benchmark interest rate and requirements for cash reserves.

The amount of money that would be required to get the economy moving in the direction of faster growth is still out of reach. It ought to be rather straightforward for investors to secure loans for investing purposes by now, and credit ought to be widely available. However, difficulties in obtaining investment capital remain. The loss of N94tn in output that Nigeria has suffered as a result of the reduction or withdrawal of activities by major multinational corporations including Microsoft, Unilever Plc, Tiger Brands Ltd, and Bayer AG has been documented by Nwafor (2024). In spite of a little uptick in 2021 and 2022, foreign direct investment (FDI) into Nigeria is still well below its recent peaks. The sum for 2023 was \$3.9 billion, down from \$5.3 billion the previous year. More than 767 companies went out of business in the first three months of 2023 alone. Opalo (2024) reports that many more are failing as a result of rising operational costs and a steady decline in consumer purchasing power. It appears that monetary policy shortcomings have plagued investment, despite its recognition as a key component of aggregate demand, and are preventing the realisation of ideal investment portfolios.

Study Objectives

The precise goals are as follows:

- i. To analyse how the money supply influences total investment spending in Nigeria
- ii. Find out how the rate of monetary policy affects Nigeria's total investment spending

Theoretical Literature

Classical Theory of Investment

The foundation of the research is the traditional view of investment. Changes in monetary policy have a detrimental effect on investment, according to the classical perspective. Investors' access to capital is likely to fluctuate in response to a rise in government spending paid for by shifts in monetary policy, as classical economists have noted. "The lack of nonbank investors, like pension funds and retirement funds, to whom the government could sell its debt without necessarily displacing private sector investment" (Christensen, 2005, cited in Olweny & Chiluwe, 2012), which means that private companies that rely on commercial bank financing will suffer when government securities are sold.

Empirical Literature

Using metrics for financial heterogeneity including leverage and cash on hand, Aktar, Abedin, and Gupta (2021) investigated how different types of investment responses to monetary policy shocks played out in the United States. This research looked at the years 1990Q1

through 2007Q4. In order to analyse the data, the study used the VAR method. The two interactions between monetary policy shock variables were determined to be statistically negligible for companies with high leverage and low cash holdings. Using a sample of publicly traded companies in the United States as a case study, Horra, Perote, and de la Fuente (2021) investigated how monetary policy affected investment at the firm level during times of economic uncertainty. The years 2000–2019 were the focus of the research. Researchers discovered that when uncertainty surges, policy-rate-based transmission mechanisms are compromised. Evidence of asymmetries at the firm level was also discovered in the investigation.

The impact of Jordan's monetary policy and tax revenues on foreign direct investment (FDI) from 1991 to 2017 was studied by Mukhtarov, Alalawneh, Azizov, and Jabiyev (2020). The data was examined by employing the VECM, CCR, and FMOLS methods, which stand for Fully Modified Ordinary Least Squares. There was a negative correlation between tax income and foreign direct investment (FDI), but a positive and statistically significant correlation between money supply and FDI. Additionally, the effect of interest rate was determined to be statistically insignificant.

Methodology

Model Specification

The functional form is as follows:

$$AGINVE = MS, MPR, PGR, RGDP, SAV \quad (1)$$

Where:

AGINVE = aggregate investment expenditure

MS = money supply

MPR = monetary policy rate

PGR = population growth rate, proxy for labour force growth

RGDP = national income, measured by real GDP

SAV = total savings

The econometric model is specified after taken the log of the variables:

$$\log AGINVE = a_0 + a_1 \log MS + a_2 MPR + a_3 PGR + a_4 \log RGDP + a_5 \log SAV + u_t \quad (2)$$

Where;

u_t = error term

a_1, a_2, a_3, a_4 and a_5 are parameters that were estimated. The a priori expectations of a_1, a_2 , and a_3 can be positive or negative, while the a priori expectations of a_4 and a_5 are expected to be positive.

Definition of Variables

Total spending on capital goods within an economy (in this case, Nigeria) over a specific time period is called aggregate investment expenditure (AGINVE). Machinery, buildings, equipment, and infrastructure are all examples of capital goods that will be used to create commodities and services down the road. The total amount of money in circulation, including easily convertible assets, is known as the money supply (M2). The Central Bank of Nigeria (CBN) lends money to deposit money banks at a rate known as the monetary policy rate (MPR).

Expansion of the population: A nation's population is its total number of inhabitants. An expanding labour force is one of the key tenets of Solow's growth model. It is common for an expanding labour force to accompany a growing population.

Spending on all final products and services produced within a country in a certain time period, often a year, is called the Real Gross Domestic Product (RGDP). The term "total savings" (SAV) describes the sum of money that does not go towards paying for goods and services during a specific time frame. It shows how much money consumers, businesses, and the government have saved altogether. Overall savings, in a broader sense, constitute an economy's investment capital.

Estimation Technique

Objectives 1 and 2 were estimated using the Ordinary Least Square (OLS) regression model.

Results and Discussion

Descriptive Statistics of the Variables

Table 1: Descriptive Statistics

| Variabes | Obs. | Mean | Standard Deviation | Minimum value | Maximum value | P-value (Skewness) | P-value (Kurtosis) |
|----------|------|----------|--------------------|---------------|---------------|--------------------|--------------------|
| AGINVE | 46 | 10951.82 | 17991.1 | 87.14485 | 82889.22 | 0.0000 | 0.0001 |
| MS | 46 | 409933.4 | 845902.6 | 5127.401 | 4027902 | 0.0000 | 0.0000 |
| MPR | 46 | 12.7228 | 4.3070 | 4.0000 | 26.0000 | 0.2194 | 0.1766 |
| PGR | 46 | 2.4887 | 0.5064 | 0.4900 | 2.7565 | 0.0000 | 0.0000 |
| RGDP | 46 | 39272.09 | 21057.7 | 16211.49 | 77936.1 | 0.0881 | 0.0002 |
| SAV | 46 | 5593.054 | 9753.975 | 3.5026 | 47375.98 | 0.0000 | 0.0001 |

Source: Estimated by the researcher

On average, the following figures are reported: ₦10,951.82 billion, ₦409,933.4 billion, ₦39,272.09 billion, ₦5,593.054 billion, 12.72 percent, and 2.49 percent, respectively, for aggregate investment expenditure, money supply, real GDP, total savings, and monetary policy rate. On average, during the sample period, ₦10,951.82 billion, ₦409,933.4 billion, ₦39,272.09 billion, and ₦5,593.054 billion were contributed by aggregate investment, money supply, real GDP, and total savings, respectively. The monetary policy rate was 12.72 percent, and the population growth rate was 2.49 percent.

The standard deviations of the monetary policy rate (4.307), the population growth rate (0.5064), and total savings (9,753.975) are moderate, suggesting that the data points are quite near to the mean values. This indicates that these variables were constant during the duration of the sample. Contrarily, there is a great deal of variation in aggregate investment spending (17,991.1 standard deviation), money supply (845,902.6 standard deviation), and real GDP (21,057.7 standard deviation). Their data values differ substantially from the average, as seen by the significant standard deviations relative to their means, which indicate greater dispersion.

In order from lowest to highest, the minimum amounts reported for aggregate investment expenditure (₦87.14 billion), money supply (₦5,127.40 billion), and real GDP (₦16,211.49 billion) are as follows. The lowest numbers for total savings, the rate of monetary policy, and the rate of population growth are ₦3.50 billion, 4.00 percent, and 0.49 percent, respectively. Alternatively, ₦82,889.22 billion, ₦4,027,902 billion, and ₦77,936.1 billion are the maximum values recorded for real GDP, money supply, and aggregate investment expenditure, respectively. The maximum values recorded for monetary policy rate, population growth rate, and total savings are ₦26.5 percent, 2.75%, and ₦47,375.98 billion, respectively. A balanced distribution around the mean is indicated by the fact that all variables have lowest values below their means and maximum values above. The lack of extreme outliers in the study's dataset is also suggested by this.

Unit Root Test

The test results are presented on Table 2.

Table 2: Augmented Dickey-Fuller and Philips–Perron unit root test results

| Variable | Augmented Dickey-Fuller Result | | Philips–Perron Result | | Lag order | Order of Integration |
|----------|--------------------------------|----------------------------|-----------------------|----------------------------|-----------|----------------------|
| | Level | 1 st Difference | Level | 1 st Difference | | |
| AGINVE | -1.878 | -3.628 | -2.401 | -4.328 | 1 | I(1) |
| MS | -2.080 | -4.201 | -2.614 | -7.898 | 1 | I(1) |
| MPR | -2.062 | -3.905 | -2.927 | -9.138 | 1 | I(1) |
| PGR | -1.6917 | -2.917 | -2.844 | -8.210 | 1 | I(1) |
| RGDP | -1.781 | -2.792 | -2.632 | -7.902 | 1 | I(1) |
| SAV | -2.008 | -4.743 | 2.729 | -6.707 | 1 | I(1) |

Source: Estimated by the researcher

The unit root test reveals that the variables do not exhibit level stationarity. It was re-differenced and the variables became stationary at first difference.

Effect of Money Supply (MS) and Monetary Policy Rate (MPR) on Aggregate Investment Expenditure

Here we will provide and analyse the results pertaining to the first objective. To begin, we have the outcome of the Johansen cointegration test, which looks for a long-term link among the objectives 1 model variables. Table 3 displays the results of this exam.

Table 3: Johansen tests for cointegration of the variables

| Maximum Rank | Eigenvalue | Trace statistic | Critical value (5%) |
|--------------|------------|-----------------|---------------------|
| 0 | - | 163.4489 | 82.49 |
| 1 | 0.8231 | 88.9618 | 59.46 |
| 2 | 0.5875 | 50.8790 | 39.89 |
| 3 | 0.3906 | 29.5793 | 24.31 |
| 4 | 0.3801 | 9.0168* | 12.53 |
| 5 | 0.1835 | 0.2963 | 3.84 |
| 6 | 0.0068 | - | - |

Source: Estimated by the researcher

It was noted that the trace statistics surpassed the critical values up to a maximum rank of 3, when compared with the 5% crucial values. The model for objective one confirmed a long-run link among the variables by identifying three cointegrating equations. After that, Table 4 displays the results of estimating the model for both objectives one and two.

Table 4: Estimates of the effect of money supply and the monetary policy rate on aggregate investment expenditure

| AGINVE | coefficients | Standard Errors | t-Statistics | P-value |
|---|--------------|-----------------|--------------------|---------|
| MS | 0.0506 | 0.0182 | 2.78 | 0.008 |
| MPR | -3.8305 | 1.4187 | -2.70 | 0.010 |
| PGR | -4.0944 | 2.0169 | -2.03 | 0.049 |
| RGDP | 0.1942 | 0.2469 | 0.79 | 0.436 |
| SAV | 1.1829 | 0.1521 | 7.77 | 0.000 |
| Constant | 3.4327 | 0.6345 | 5.41 | 0.000 |
| R2 | | | 0.6896 | |
| Adjusted R-Squared | | | 0.6498 | |
| F-statistics | | | 17.33 (0.0000) | |
| Durbin-Watson d-statistic (6, 45) | | | 2.2883 | |
| Breusch–Godfrey LM test | | | 1.514 (p = 0.8107) | |
| Breusch–Pagan/Cook–Weisberg test for heteroskedasticity | | | 1.78 (p = 0.0951) | |

Source: Author's computation

There was a positive and statistically significant change in monetary supply and total savings, but no change in real GDP. Contrarily, there was no statistically significant change in the monetary policy rate or the population growth rate. Aggregate investment spending was negatively and statistically significantly affected by the population growth rate. Aggregate investment spending fell by a substantial 4.04% as the population growth rate increased.

A value of 0.6896 was displayed by the coefficient of determination, R². Approximately 68.96% of the variation in total investment spending was accounted for by the model's independent variables. Other factors, not addressed here, account for the remaining 31.04% shift in total investment spending. The independent variables, however, demonstrated an excellent fit with an explanatory power of 68.96%. With a p-value of 0.0000, the F-statistic was 17.33, which is statistically significant. This indicates that the aggregate investment spending was significantly affected by the money supply, real GDP, total savings, monetary policy rate, and population growth rate all together. A value of 2.2883 is the Durbin-Watson d-statistic. We accept the null hypothesis that there is no autocorrelation because the value is close to 2. For example, there was no autocorrelation between the rate of monetary policy, total savings, real GDP, population growth, and money supply. There was a p-value of 0.8107 and a Breusch-Godfrey LM test statistic of 1.514. The lack of serial correlation as the null hypothesis is upheld due to the statistical insignificance of the p-value. Consequently, consistent with the results of the Durbin-Watson test. There was a heteroskedasticity statistic of 1.78 and a p-value of 0.0951 according to the Breusch-Pagan/Cook-Weisberg test. Homoscedasticity (constant variance) is accepted as the null hypothesis due to the non-significant p-value. That the variables' variances were constant is another consequence of this.

Also, to check how linearly related all of the model's independent variables were, a multicollinearity test was run. Table 5 displays the results of this test.

Table 5: Multicollinearity test Result

| Variable | VIF | 1/VIF |
|----------|------|----------|
| RGDP | 2.39 | 0.417964 |
| PGR | 2.32 | 0.4315 |
| SAV | 1.08 | 0.9286 |
| MPR | 1.03 | 0.9700 |
| MS | 1.01 | 0.9947 |
| Mean VIF | 1.56 | |

Source: Estimated by the researcher

All of the variables' variance inflation factors (VIF) were shown to be much lower than the industry standard of 10. The average VIF was also below 10, which is quite concerning. It is reasonable to accept the null hypothesis that the independent variables are not significantly multicollinear, since the VIF values are low.

Conclusion

This study used the Ordinary Least Squares (OLS) approach to analyse the link between monetary policy and aggregate investment spending in Nigeria. The results of the study were published. In Nigeria, aggregate investment expenditure is heavily influenced by monetary issues, according to the research. Investment activity is boosted by increased liquidity and domestic savings, as seen by the positive and strong link between money supply and total savings. Since the monetary policy rate has a negative and substantial impact, it follows that higher interest rates deter investment because they make borrowing money more expensive. Although there was a weak positive correlation between real GDP and investment, showing that economic expansion is not the sole driver of investment, there was a large negative correlation between population growth and investment, highlighting the pressure that fast population growth puts on investment funds. In order to promote investment-led growth in Nigeria, the results show that sound monetary policy, efficient savings mobilisation, and population control are crucial.

Recommendations for Policy

It is suggested that you consider the following options:

- i. Drastically lowering the monetary policy rate would be a friendly move by the Central Bank towards lowering borrowing costs and promoting more investment in the economy.
- ii. In order to increase investment and increase access to credit, the Central Bank should cut bank reserve requirements and maintain sufficient liquidity in the financial system as part of an expansionary monetary policy that is well-managed.
- iii. The government should make measures to boost domestic savings, like making savings accounts more appealing with competitive interest rates and increasing the availability of safe and efficient banking services, particularly in rural regions.

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