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INFLUENCE OF MONETARY POLICY VARIABLES ON MANUFACTURING FIRMS: AN EMPIRICAL ANALYSIS OF NIGERIAN MANUFACTURING FIRMS.

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ABSTRACT
This study examined monetary policy variables and their impact on the performance of selected manufacturing firms in Nigeria. The objectives were to evaluate how money supply, the monetary policy rate, interest rate, and exchange rate influence manufacturing firm performance in Nigeria, using Dangote Group as a case study. The study used the ordinary least squares (OLS) multiple regression method to test and estimate relevant equations. The results showed a positive and significant relationship between money supply and Dangote Group's performance; the monetary policy rate also had a positive and significant effect on Dangote companies, while the interest rate had a significant negative effect on their performance. The study therefore recommended that monetary authorities should improve current macroeconomic variables, such as money supply and inflation, to enhance manufacturing sector performance. Additionally, it suggested that monetary authorities should continue adjusting the monetary policy rate to promote stability and improve the performance of Nigeria's manufacturing sector.

Keywords: monetary policy, manufacturing, Nigeria, monetary authorities
JEL: E52, O14

INTRODUCTION
The Nigerian manufacturing sector is a key focus of the government's efforts to diversify its economic base and restructure the economy. This sector plays a significant role in shaping emerging economies like Nigeria (Ajayi, 2020). It also offers opportunities for increasing productivity through exports, import substitution, job creation, and generating foreign exchange, which in turn influences economic growth and development (Coad & Vezzani, 2019). To achieve

the nation's economic goals, the Nigerian government has implemented various policies to address the declining performance of the manufacturing sector, primarily using fiscal and monetary measures (Nwosa & Saibu, 2011).

Okwu et al. (2011), Adesoye et al. (2012), Baghebo and Ebibai (2014) argued that monetary policy has a faster and greater impact on economic activities, emphasizing that more focus should be placed on monetary measures, especially when conducting stabilization policy. According to Obim et al. (2018) and Ubi et al. (2012), monetary policy is a macroeconomic tool used by the nation's financial authority to manage the economy and achieve desired outcomes. This involves actions taken by the Central Bank to influence the cost and availability of credit.

In literature (Adefeso & Mobolaji, 2010; Busari et al., 2002; Fasanya et al., 2013), the main goals of monetary policy for most nations include promoting employment, maintaining price stability, supporting output growth, ensuring balance of payments equilibrium, and achieving sustainable development. These goals are vital for the attainment and maintenance of both endogenous and exogenous balance of the value of money and the promotion of economic growth.

Wanaset (2009), for example, argued that a persistent rise in prices and the cost of living negatively impacts private agents' decisions regarding saving, production, and investment, thus slowing economic growth. As Fasanya et al. (2013) mentioned, the emergence of the money market has introduced various financial instruments that are vital for raising debt for the government, serving as significant earning assets for investors, and providing a means to balance market liquidity. The central bank has used these monetary instruments since its establishment in 1959 in its traditional role of regulating the money supply, a role based on implementing monetary policy aimed at achieving price stability, full employment, economic growth, and external balance. (Nwosa & Saibu, 2011) stated that Nigeria has experienced various regimes of monetary policy over time; some were loose, while others were tight, but all aimed at stabilizing prices and improving performance in the real sector.

Like other developing countries, Nigeria's monetary policy has undergone significant changes, shifting from the use of direct to indirect instruments of monetary management. Before the Structural Adjustment Programme (SAP) in 1986, monetary management relied heavily on direct monetary tools. These included selective credit and credit ceilings, manipulation of interest and exchange rates, special deposits, and cash reserve requirements. However, evidence shows that market-based instruments were rarely used during this period (Takon et al, 2020).

Notably, the Nigerian economy has experienced periods of contraction and expansion. However, the reported growth has never been sustainable due to a decline in real sector output, which is the primary driver of growth in line with the nation's poverty level. CBN (2012) showed how insignificant Nigeria's manufacturing sector contribution is to the economy when compared to other sectors such as agriculture and petroleum. Clearly, there are significant concerns about the continual decline of manufacturing sector output in Nigeria, despite various strategies implemented by the Nigerian monetary authority to improve capacity utilization and industrial production in the sector.

The history of manufacturing and industrialization development in Nigeria clearly shows how an

economy can neglect a vital sector through distractions and inconsistencies in government policies, especially after the discovery of petroleum in the country. The neglect of agricultural development has deprived the nation's manufacturers of their primary source of raw materials, leading to low levels of industrialization. Research indicates that some problems facing the Nigerian manufacturing sector include unpredictable government policies, high lending rates, infrastructural deficiencies, lack of effective regulatory agencies, unfair tariff regimes, high importation and dumping of cheap products, and low patronage. In light of these issues, the study aims to examine the impact of monetary policy variables on the performance of selected Nigerian manufacturing firms.

Uncertain laws and regulations can greatly affect producers, especially in the production of high-risk critical goods and under environmental restrictions (Feng et al., 2019; Kogan et al., 2017). Moreover, the increased uncertainty brought about by these regulations can influence financial risk as well as production and inventory management.

The main goal of this study is to evaluate how monetary policy variables influence the performance of selected Nigerian manufacturing firms. Its secondary objectives are:

- Investigate the extent to which the money supply has impacted the performance of Dangote Group of Companies.
- Assess the extent to which the monetary policy rate has impacted the performance of Dangote Group of Companies.
- Evaluate the extent to which interest rates have impacted the performance of the Dangote Group of Companies.

This research proposes the following testable hypotheses stated in null form:

- H01: There is no significant relationship between money supply and the performance of Dangote Group of Companies.
- H02: Monetary policy rate has no significant relationship with Dangote Group of Companies' performance.
- H03: Interest rate has no significant relationship with Dangote Group of Companies' performance.

LITERATURE REVIEW

Theoretical framework

The proposed theoretical framework for this study will focus on two main issues: the Keynesian IS-LM model and credit channel theory.

The Keynesian IS-LM model

The Keynesian IS-LM model offers a more effective econometric tool for analyzing the effects of monetary policy, considering private sector activities as influenced by interest and exchange rates, the money supply, and inflation (Gabaix, 2020). The Keynesian curve shows the possible combinations of interest rates and output levels were planned spending matches income. The LM schedule depicts combinations of interest rates and income levels where the demand for real balances equals the supply, and along the LM schedule, money market equilibrium is achieved (Heim, 2017).

However, the IS curve slopes downward, showing that a decrease in the interest rate boosts investment levels, leading to higher aggregate demand and output (Farmer & Platonov, 2019). At equilibrium, reducing government spending lowers aggregate demand, which causes output to increase to meet the demand, and the reverse is also true. The new equilibrium results in higher output and income, and interest rates rise due to the increased demand for investment funds; as a result, interest rates increase accordingly. According to Murphy & Walsh (2015), when government spending decreases, interest rates decline, encouraging private sector investment; hence, when government expenditure increases, it crowds out private investment. If interest rates stay stable, government spending will raise income and create a new equilibrium. While the goods market is in balance, income grows, and the demand for money increases, leading to excess demand. Consequently, interest rates will go up unless the money supply increases in proportion. However, monetary policy supports fiscal policy by increasing the money supply to prevent interest rates from rising.

Credit channel theory

In January 1963, Bucklin introduced the theory of the Credit Channel, with his work published in the Journal of Marketing, as part of an effort to organize the distribution channel. It is widely accepted in the literature that analyzing the relationship between manufacturing sector output and monetary policy shows that credit plays a significant role in production. According to (Khan, 2011), changes in interest rates caused by the monetary authority through open market operations affect the cost of capital and the rate of fixed investment. These interest rate changes impact demand and overall output (Gross Domestic Product). According to the credit channel theory, market frictions create a spread between firms' external and internal sources of financing.

Using credit transmission channels, monetary policy impacts the cost and availability of loans by banks (the external finance premium). Tight monetary policy causes firms to lose access to certain credits, which cannot be replaced by equity; as a result, this leads to higher funding costs and a reduced loan supply (Orok et al., 2021). In developed economies, firms have access to various funding sources beyond bank loans, but in developing economies—Nigeria included—the financial markets are underdeveloped (Obim et al., 2018; Wurgler, 2000); therefore, only large firms can access funds from external markets, while smaller firms must depend on bank loans and internally generated funds. In such cases, the internal rate of return (IRR) shows greater

The growth nexus of the manufacturing sector in Nigeria

Since independence, the manufacturing sector has been vital in transforming the economy and serving as an effective means of increasing productivity, earning foreign exchange, expanding exports, reducing imports, creating jobs, and boosting per capita income. The Nigerian manufacturing sector attracts investment faster than any other part of the country's economy, while also fostering broader and more efficient links among various sectors (Ogwuma, 2005). Recognizing the many advantages of this sector, the Nigerian government has adopted various economic strategies and programs to promote its growth. Some of these strategies include the export promotion strategy, import substitution and reduction strategy, the National Economic Empowerment and Development Strategy (NEEDS), and the establishment of the Bank of Industry (BOI) to provide credit to the sector (Geo-JaJa & Azaiki, 2007; Ogundele et al., 2011; Olusoji & Oloba, 2014).

Once again, the Structural Adjustment Programme (SAP), introduced in May 1986, aimed to rejuvenate and strengthen the manufacturing sector (Chagunda, 2022; Isaac & Akyuz, 2019; McGregor, 2005). This was achieved by shifting focus from relying on external sources to sourcing inputs locally through fiscal and monetary incentives. Additionally, according to (Ammani, 2012), to enhance the sector's productivity and competitiveness, the foreign exchange market was deregulated, though this also caused a notable rise in input costs. Looking at the manufacturing sector's contribution to the country's gross domestic product over time, the results have been underwhelming (Abdullah, 2015; Kenneth & Onyedikachi, 2021). For instance, in Nigeria, the sector contributed only 34.94 percent to the gross domestic product in 1986, but this declined to 22.84 percent in 1990 and further dropped to 10.17 percent in 1995. Later years saw minimal contributions, especially in 2000, 2005, and 2013, with figures of 6.97 percent, 2.80 percent, and 1.88 percent, respectively. These modest contributions of the manufacturing sector compared to the nation's gross domestic product are largely due to the ongoing decline of the country's infrastructure, particularly the power sector.

Empirical review

Empirically, Chigbu & Okonkwo (2014) studied monetary policy and Nigeria's efforts toward import substitution and industrialization. Their findings, using the error correction model (ECM), showed that the money supply significantly affects the country's industrial output. They disagreed with Olanipekun & Akeju (2013) while supporting Milton Friedman's new monetary hypothesis of the quantity theory, which aligns with the modern quantity theory of money (led by Milton Friedman). This theory indicates that the money supply responds directly to income and greatly influences industrialization in Nigeria.

Again, Olorunfemi and Dotun (2008) investigated how monetary policy affects economic performance in Nigeria using the multiple regression technique, and results confirmed a negative relationship between the explanatory variables (interest rate and inflation) and the dependent variable (Gross Domestic Product). Meanwhile, Olanipekun and Akeju (2013) examined the connection between money supply, inflation, and capital accumulation in Nigeria, applying the error correction technique to evaluate narrow money supply (M1) and broad money supply (M2). Their results showed that variations in money supply had a non-significant and negative effect on inflation in Nigeria.

Furthermore, Mengesha & Holmes (2013) examined monetary policy and its transmission mechanisms in Eritrea, and their analysis revealed that monetary policy has been relatively ineffective in Eritrea, while the country's foreign exchange market remained inactive; this is attributed to the effectiveness of the black market for exchange rates.

Odior (2013) examined the effect of macroeconomic factors on manufacturing productivity in Nigeria from 1975 to 2011, using the Augmented Dickey-Fuller (ADF) and error correction mechanism (ECM) models. It found a long-term equilibrium relationship, as shown by the co-integrating effect of the VECM. Additionally, the study showed that loans to the country's manufacturing sector and foreign direct investment tend to increase manufacturing productivity in Nigeria, while the broad money supply had the opposite effect.

METHODOLOGY

This study used an ex-post facto design, which means the researcher cannot control the variables because they have already occurred and cannot be changed. The secondary data for this study was gathered from annual reports of Dangote Group from 2000 to 2020, and a time series analysis using Ordinary Least Square was applied to examine the relationships among the variables.

Model specification

The research aims to analyze how monetary policy variables relate to the performance of selected manufacturing firms in Nigeria. To do this, an econometric model is built based on the Keynesian IS–LM framework.

DANGPERF = f (EXCR, INT, MS2, MPR)

Where:
DANGPERF= Dangote Group Performance (proxied by sales turnover)
EXCR= Exchange rate
INT = Interest rate
MS2 = Broad money supply,
MPR = Monetary policy rate
Ut = error term.
The *apriori* expectation:
$\beta1>0$, $\beta2>0$, $\beta3>0$, $\beta4<0$.

DATA ANALYSIS, RESULTS, AND DISCUSSIONS

Data Analysis

Table 1: Excerpts of the regression result (Dangote Group of Companies)

Variables	Coefficients
C	7.5633
LINFL	0.0182
LINTR	0.2603
LEXCR	0.9313
LM2P	0.2066

R^2 = 0.9909 R^2(Adj.) = 0.9883 F-Stat = 383.756 Prob. = 0.000000 DW = 1.90

Source: Researchers' computation using E-Views 12

The results of the OLS regression dynamics as presented in table 1 showed that the regression model has a good fit on the data. This is evidenced by the high R-squared value of 0.9909 (99.09 percent) and the adjusted R-squared of 0.9883 (98.83 percent). Based on this result, approximately 98 percent of the changes in the Dangote Group's performance have been explained by variations in exchange rate (EXCR), inflation rate (INFL), interest rate (LEN), and real money supply (M2P).

Similarly, the high F-statistic value of 383.756 indicates that the overall model is statistically significant. Additionally, the Durbin-Watson (DW) statistic of 1.90 falls within the acceptable

range indicating no autocorrelation. Analysis of the regression estimates reveals that variations in inflation (INFL) have an insignificant impact on the performance of Dangote Group of Company, while changes in the exchange rate (EXCR) have a positive and significant effect. Specifically, a 1% increase in the exchange rate will lead to a 0.9313 or 93.13% increase in the performance of Dangote Group of Company, all else being equal.

Similarly, variations in the value of real money supply (M2P) will have a significant and positive effect on the performance of the Dangote Group of Companies, amounting to 0.2066 or 20.66 percent, ceteris paribus. Further investigation of the results revealed that the interest rate (INTR) has a significant and positive impact on the value of the performance of the Dangote Group of Companies, amounting to 0.2603 or 26.03 percent.

Test of hypotheses
Decision Rule

- If F-calculated > F-tabulated, reject the null hypothesis (H0).
- If F-calculated ≤ F-tabulated, do not reject the null hypothesis (H0).

Applying the above rule, we test the null hypothesis that the interest rate has no significant influence on the performance of Dangote Group of Companies. Given the results: F-calculated = 383.756 and F-tabulated = 2.87, it means that the calculated F value from our sample data exceeds the critical value from the F-distribution table; hence, we reject the null hypothesis (H0) and conclude that changes in interest rates have a statistically significant impact on the company's performance.

Based on the null hypothesis that there is no significant relationship between exchange rate and the performance of Dangote Group of Company, and given F-calculated: 74.752 against F-tabulated: 2.87, we reject the null hypothesis and conclude that there is a significant relationship between exchange rate and the performance of Dangote Group of Company hence the fluctuations in exchange rates significantly impact the company's performance.

Testing the hypothesis that there is no significant influence of money supply on the performance of Dangote Group of Companies, with an F-calculated value of 115.835 and an F-tabulated value of 2.87. Therefore, we reject the null hypothesis (H0) and conclude that there is a significant influence of money supply on the performance of Dangote Group of Companies.

Discussion of findings
This study examined monetary policy and the performance of the Nigerian manufacturing sector, using variables such as money supply, exchange rate, and interest rate. To achieve these objectives, the study employed the OLS empirical regression test and presented the following findings.

The results of the regression analysis showed that the intercept for Dangote Group of Company was 7.5633, indicating that the company's performance will increase by this value when all other variables are held constant. Additionally, the results revealed that exchange rates have a significant positive relationship with the company's performance. Lastly, the findings also demonstrated that money supply has a significant positive impact on Dangote Group of Company's performance.

The findings suggested by this investigation are in agreement with (Woltering, 2015), who analyzed monthly panel data from 2000 to 2014 for nine regions in the US and found that interest rate changes affected the performance of listed real estate companies. He considered the relative discount and premium of the NAV as well as the debt profiles of the companies. Again, (Rocha et al., 2018), in their analysis of how interest rates mediate the performance of Microfinance Institutions, found a significant influence on the poverty reduction efforts of MFIs and suggested that they are major drivers of financial performance. This is also in agreement with (Ammani, 2012; Odior, 2013), which state that macroeconomic variables influence the productivity level of the Nigerian manufacturing sector.

CONCLUSION AND RECOMMENDATIONS

The study examined the impact of selected monetary policy variables on the performance of Dangote Nigeria PLC (Ammani, 2012; Odior, 2013), which states that hypotheses were formulated and tested to assess the exact effect of selected macroeconomic variables on the performance of Dangote Nigeria PLC. From the analyzed results and findings, it is proven that the variables captured in our model have an individual significant position on how they affect the performance of Dangote Nigeria PLC. The results of our analyses revealed mixed findings, as some variables had an adverse effect on the performance of Dangote Nigeria PLC, while others exhibited a positive relationship.

Recommendations

For Dangote Group of Companies to manage the effects of changes in the monetary policy variable and ensure financial stability and sustained growth amidst varying economic conditions, we recommend the following:

1. Since the finding suggests that interest rates have a significant impact on the performance of Dangote Group of Companies, we suggest robust use of financial instruments to hedge against interest rate fluctuations, such as interest rate swaps, futures, and options, that will protect the firm against adverse movements.
2. Dangote should increase the company's revenue streams in different currencies to reduce dependency on any single currency, which can be achieved by expanding operations into new international markets.
3. We suggest here that Dangote should adjust capital allocation strategies in response to changes in the money supply. For instance, during periods of monetary expansion, consider expanding investments, and focus on cost optimization during contractionary periods in line with monetary policies.

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