



Monetary Policy Instruments and Manufacturing Sector Output in Nigeria

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ABSTRACT

Monetary policy is the combination of measures designed to regulate the value, supply and cost of money in an economy, to match with the desired level of economic activities. The main objective of the study is to examine the effect of monetary policy instruments on manufacturing sector output in Nigeria. The specific objectives are to: evaluate the effect of monetary policy rate on manufacturing sector output in Nigeria. Examine the effect of treasury bill rate on manufacturing sector output in Nigeria. Access the effect of cash reserve ratio on manufacturing sector output in Nigeria and investigate the effect of money supply on manufacturing sector output in Nigeria. The study employed an ex-post facto research design because the data for the study were secondary data which were obtained from Central bank of Nigeria Statistical Bulletin, 2020. The result of the study indicates that manufacturing subsector output is an endogenous variable in the explanation of the effect of monetary policy on manufacturing sector output in Nigeria in the short run, monetary policy rate, money supply has positive and significant effect on manufacturing sector output in the short run while treasury bill rate has no significant effect on manufacturing sector output in the short run. Amongst the recommendations of the study is that the Central Bank Nigeria should employ an expansionary monetary policy that can increase the money supply to the real sectors and boost performance of the Nigerian economy. The Central Bank Nigeria should reduce the MPR to attract low interest rates that can encourage credit and boost productivity across the sectors in Nigeria. As seen from the results, the various monetary policy tools have diverse effects on manufacturing outputs in Nigeria. The Central Bank Nigeria should employ different set of monetary policy directives under guided deregulation for each of the sectors in Nigeria. Financial institutions, especially the Deposit Money Banks, should not be constrained by CRR as this might hinder growth in the economy.

Keywords: Monetary Policy Instrument, Manufacturing Sector Output, Nigeria

INTRODUCTION

Many developing economies specialise in the production of primary unprocessed raw materials like agricultural products and exploration of natural resources such as crude oil and gold. These economies are largely under-industrialised and prone to substantial shocks, which expose the economies to enormous supply-side shocks (Adegbemi, 2018). Economic development theories have explained that industrialisation is the way to achieve faster growth and poverty reduction (Adekunle, Alalade, & Okulenu, 2016). Nigeria has made concerted efforts at diversifying her economy. These efforts are in the form of policies that encourage growth of the different sectors of the economy. Monetary policy has been

largely debated as an indispensable tool for industrialization. According to the classification by the Central Bank of Nigeria (CBN), an industrial sector is a group of firms engaged in similar business interest and production/service line. According to the CBN (2017), the industrial activities in Nigeria are grouped in terms of “activity sector”.

The term, monetary policy refers to instruments of monetary management involving a combination of measures designed by the Central Bank of a country to regulate the availability, value, supply and cost of credit/money in domestic economy with a view to achieving expected macroeconomic stability/targets (Akomolafe, Danladi, Babalola & Abah, 2015). Macroeconomic policy, on the other hand, refers to actions taken by government agencies responsible for the conduct of economic policy to achieve some desired objective of policy through the manipulation of a set of instrumental variables. This puts two set of concepts in perspective: “target variables” and “instrumental variables”, with the target variables being the ones for which the government seeks desirable values and are the immediate goals of macroeconomic policy (Siyasanga, & Hlalefang, 2017). These macroeconomic objectives for Nigeria and most developing countries include sustained rate of economic growth, price stability, balance of payment equilibrium, exchange rate stability and full employment

The CBN organizes monetary policy targets into three stages with the first being operational target: the manipulation of reserve money over which it has substantial direct control; intermediate target as the level of broad money supply (M_2) which has indirect impacts on the ultimate target of final objective of monetary policy in the areas such as inflation and output. The third is the situation where the CBN in carrying out these functions with the use of nominal anchor in executing her monetary policy. The nominal anchor is an instrument used by the apex bank to pin down expectations of private agents about nominal price level or its path or about what the bank might do with respect to achieving the target path (CBN, 2018). The nominal anchor comes in two types: quality based nominal anchor where quality of money is the target and price-based nominal anchor, which targets exchange or interest rates. The CBN has been known to apply the broad money supply (M_2) as its nominal anchor for monetary policy.

The three stages of monetary policy target implementation has often been used by the CBN to tackle most of the frequently occurring monetary policy problems which Siyasanga and Hlalefang, (2017) itemised to include among others: managing excess liquidity, rapid expansion in credit and as well as excess foreign exchange and capital inflows, uneven distribution as well as inflationary pressures arising from overheating the polity; uncertainty about the transmission mechanism, and fiscal policy outlook, etc. In pursuit of mitigating these challenges, monetary policy in Nigeria has experienced two main phases which are the era of direct controls (1959-1986) and the era of market-based controls (1986-date). In the era of direct control, the CBN used directives targeted at specific sectors to fix or control interest rate, exchange rate, determine credit allocation to choice sectors, etc. Al-Fawwaz and Al-Sawai'e (2012) were of the opinion that the direct control mechanism was ineffective because of the heavy influence from political consideration normally conveyed to the CBN through the Ministry of Finance.

The market-based era introduced through the Structural Adjustment Programme (SAP) since 1986 entail the use of indirect monetary policy instruments allowing the forces of demand and supply to influence macroeconomic targets through the role of interest rate. This period brought about a revamp of the financial system in Nigeria through the deregulation exercise that brought the creation of two foreign exchange markets in 1986, removal of interest rate controls, liberalisation of bank licensing and the unification of the foreign exchange markets in 1987. It also witnessed the establishment of the foreign exchange bureaus in 1988, relaxation of the bank portfolio restrictions and establishment of the Nigerian Deposit Insurance Corporation in 1988. There were some other policies that support price-based economy such as the payment of interest on demand deposits, introduction of the auction markets for government securities, and the removal of mandatory credit allocation guidelines. These reforms were to give leeway to the use of the indirect monetary policy instruments.

However, within these periods the CBN operated the market-based policy alongside with the direct policy (CBN, 2018). As time progressed and the financial market deepens, the use of direct control fizzled out completely as the introduction of the Open Market Operations (OMO) in 1993 became the new key

anchor. Other market-based tools which in addition to OMO, include reserve requirements which specifies the proportion of a bank's total deposit liabilities that should be kept with the central bank; and discount window operations under which the Central Bank performs the role of lender of last resort to the deposit money banks. The OMO operations may be done through direct (outright transaction) or repurchase transactions and/or reverse repo. However, the OMO is being complemented by other instruments which are discount window operations, moral suasion, forex sales and the standing facility introduced in December 2006.

Statement of the Problem

Since the introduction of the Structural Adjustment Programme and all the attendant liberalisation policies, the Nigerian economy has become more open to the market forces and its attendant problems. Some of these problems include high inflation, unstable economic growth, high and increasing rate of unemployment, trade imbalances, unstable exchange rate and high interest rate. This negates the notion that the adoption of a more open economy and the application of price reliant monetary policy is more effective in boosting manufacturing sector output in developing economies like Nigeria.

Previous studies to examine the effects of monetary policy on manufacturing sector output have been conflicting. Some of the existing studies disagreed both in the line of significance and direction of relationship. Some of the studies like Charisma, Lucky & Matthew, (2018), Odior, (2013), Nwosa and Saibu (2012) show a significant positive effects while the work of Siyasanga and Hlalefang, K.(2017) Yunana and Amba (2016) found that all the variables of monetary policy employed have a negative effect on manufacturing output. The result of the study carried out by Adegbemi, 2018; Adekunle, Alalade & Okulenu, 2016) indicate that monetary policy no effect on manufacturing sector output . The discrepancies in these results could be attributed to the use of different statistical techniques and time period, variables used for these studies. Any study that employed a more robust Autoregressive Distributive Lag (ARDL) approach is most likely to produce better and more reliable empirical results as given by Hillary, Imo and Uche (2018) on the state of monetary policy and manufacturing sectorial output nexus in Nigeria. Consequently, this calls for a more robust monetary policy model that could be used to engender economic stability and enhance manufacturing sector output in Nigeria

REVIEW OF RELATED LITERATURE

Conceptual Framework

Monetary Policy Instruments

The essence of government control of an economy is to achieve a desired stability for sustainable development. Monetary policy is one of the economic strategies of the government undertaken through the apex bank in the country to foster macroeconomic stability in order to promote economic growth (Hillary, Imo & Uche (2018). The monetary authority, which is the Central Bank of Nigeria (CBN) in the case of Nigeria, aims to control the value of money in circulation. The Central Bank of Nigeria (1992) in Adegbemi, (2018) defined monetary policy as the combination of measures designed to regulate the value, supply and cost of money in an economy, to match with the desired level of economic activities. The monetary authority acts to control the direction and movement of monetary policy and credit facilities in pursuance of stable price and economic growth in an economy.

According to Akomolafe, Danladi, Babalola. and Abah, (2015) monetary policy is a deliberate effort of the government geared towards altering the volume and value of money supply, cost of credit, size of credit and direction of credit in order to influence the level of economic activities to achieve desired macroeconomic stability in an economy. Thus, monetary policy is a deliberate action to stabilise the economy by influencing the quantity, cost and availability of money credit.

The process of monetary policy is a complex one involving rigors of measures planned to regulate and control the volume, cost and availability of money and credit within an economy in order to achieve some specified macroeconomic policy objectives (Anyanwu, 1993). Ebikila, Agada, Lucky and Matthew, (2018) have succinctly averred that monetary authorities can effectively employ monetary policy instruments to determine the direction of real economic outcomes. The ability to use monetary policy

tools to influence the economy depends on how far the monetary authority is able to control the cost and volume of money. This implies that money supply is the main anchor of monetary policy stance of every government (Ezeji & Michael, 2013).

In order to control money supply, two sets of monetary policies applicable is either expansionary or contractionary (restrictive) policy. An expansionary monetary policy is designed to stimulate the growth of aggregate demand through increase in the rate of money supply thereby making credit more available and interest rates lower. An expansionary monetary policy is more appropriate when aggregate demand is low in relation to the capacity of the economy to produce goods and services. On the contrary, if the quantity of money is reduced or restricted, money income will rise slowly so that consumers spend less and funds for investment are difficult to acquire thereby decreasing aggregate investment (restrictive monetary policy) (Gatawa, Akinola & Muftau, 2017).

Money Supply

Money supply is the total amount of all forms of money in circulation in a given country at a given period of time (Jhingan, 2005; Abdullahi, 2009). Total money supply can be grouped into three broad categories as defined by the Central Bank of Nigeria: These money (M_1) and broad money (M_2) (CBN, 2003). M_1 indicates currency in circulation plus current account deposits with commercial banks while M_2 is M_1 plus savings and time deposits. If the apex Bank wants to curtail money supply by reducing the power of participants (Deposit Money Bank), it will increase interest rates, while in case of an expansionary monetary policy the reverse will be the case (Yunana & Amba, 2016). There is M_3 covering M_2 plus near money as defined by Gurley and Shaw. However the Central Bank of Nigeria adopts M_2 definition which it refers to as total money aggregate (Akamolafe, Danladi, Babalola & Abah, 2015).

There is excess money supply when the amount of money in circulation is higher than the level of total output of the economy. When money supply exceeds the level the economy can efficiently absorb, it dislodges the stability of the price system, leading to inflation or higher prices of goods. Money Supply is the life wire of all economic activities and so has powerful effects on the economic life of any nation. An increase in Money Supply puts more money in the hands of producers and consumers and thereby stimulating increased investment and consumption. Consumers increase purchases and business firms respond to increased sales by ordering for more raw materials and other resources to achieve more production, the spread of business and capital goods. As the economy goes buoyant, Stock Market prices rise and firms issue more equity and debt instruments. As the Money Supply expands, prices begin to rise, especially if output growth reaches full capacity. Lenders insist on higher interest rates to offset expected decline in purchasing power over the life span of their loans. Opposite effects occur when the Money Supply falls or when there is decline in its growth rate, economic activities decline and disinflation (reduced inflation) or deflation (falling price) results (Umeora 2010).

The CBN changes the level of money supply to control base money. Monetary Base is made up of currency and coins outside the banking system plus the deposits of banks with the Central Bank. If the Central Bank perceives that there is too much money in circulation and prices are rising (or there is potential pressure for prices to rise), it may reduce money supply by reducing the base money. To reduce the base money, the Central Bank sells financial securities to banks and the nonbank public so as to reduce the ability of deposit money banks to create new money. The Central Bank can reduce the money supply by also raising the cash reserve deposits that banks are required to hold with the Central Bank. The larger the deposit balances on bank balance sheet, the higher their ability to create more money. Central bank monetary policy therefore, targets the growth in those deposit balances so as to control the expansion in money supply which could precipitate price distortions. Monetary stability can contribute towards price stability in the Nigerian economy since the variation in price level is mainly caused by money supply (Mohamed & Sri, 2016).

Monetary Policy Rate

Monetary policy rate is the baseline interest rate that every other interest rate adds on to. The rate controls the amount of money in circulation at any given time. Monetary policy rate is set by the Apex bank of a country. Situating it to Nigeria context, it refers to the Central Bank of Nigeria benchmark for interest rate

in the Nigerian economy. It is a short term interest rate at which banks can borrow from the apex bank. The MPR was introduced by the former CBN Governor, Professor Charles Soludo in December 2006 to replace the minimum rediscount rate (MRR). A rise in monetary policy rate will result in the shrinking of money in circulation and when you lower it, money supply will expand. The decision to tighten or loosen money supply in an economy rest on the apex bank and depends on its monetary policy focus. Monetary policy rate for Nigeria has remained at 14% since July 2016, but have been reviewed by the Central Bank of Nigeria to 13.5% in March, 2019

In the late 1970s and early 1980s, a number of central banks world-wide adopted monetary targets as a guide for monetary policy. Monetary targeting is an attempt by central banks to describe or determine the optimum money stock that will yield the desired macroeconomic objectives. Theoretically, the choice of target is normally between the stock of monetary aggregates and interest rates. Whenever the money demand function is unstable, interest rate is generally the preferred target; otherwise, the money stock is the appropriate target (McCallum, 1989). In the early 1990s, some central banks adopted numerical inflation or nominal GDP targets as guides for monetary policy in contrast to the conventional choice of interest rate or money stock. Economists and analysts attribute this departure to the unreliability of monetary aggregates as guides for monetary policy (Osakwe, Ibenta & Nzotta, 2019).

Treasury Bill Rate

Treasury bill rate is used as a proxy for the return on the governments' debt instruments. It is expected that high Treasury bill rates can have a positive impact on commercial banks' investment in Government's instrument. Further, it is anticipated that the high Treasury bill rates could engineer upward pressure on commercial rates in the economy thereby leading to higher interest rates on loans and advances. In this regard, a positive impact is also expected on commercial banks' investment in loans. The inclusion of the Government's fiscal balance has merit in the fact that Government's debt financing activities are driven primarily by the balance on its fiscal accounts (Biza, Kapingura & Tsegaye, 2013)

These are instruments for short term borrowing issued by the Central Bank on behalf of the Federal Government to meet its short term treasury need. A Treasury Bill is a paperless short-term borrowing instrument issued by the Government through the Central Bank of Nigeria (as a fiscal agent) to raise money on short term basis – for a period of up to 1 year. Treasury bills are issued in maturities of 91, 182 and 364 days. Treasury bills are sold at a discounted price to reflect investor's return and redeemed at face (par) value (Anthony, 2015).

Cash Reserve Ratio

Cash Reserve Ratio refers to a certain percentage of total deposits the commercial banks are required to maintain in the form of cash reserve with the central bank.

The objective of maintaining the cash reserve is to prevent the shortage of funds in meeting the demand by the depositor. The amount of reserve to be maintained depends on the bank's experience regarding the cash demand by the depositors. If there had been no government rules, the commercial banks would keep a very low percentage of their deposits in the form of reserves. Since cash reserve is non-interest bearing, i.e. no interest is paid on the deposits, therefore, the commercial banks often keep the reserve below the safe limits. This might lead to a financial crisis in the banking sector. Thus, in order to avoid such uncertainty the central bank imposes a cash reserve ratio or CRR on commercial banks. The central bank has the legal power to change the CRR any time at its discretion. The cash reserve ratio is a legal requirement and therefore it is also called as a Statutory Reserve Ratio (SRR). Through a cash reserve ratio, the central bank can change money supply in the economy. Such as, when the economy demands a Contractionary Monetary Policy the central bank will raise the CRR. On the other hand, when the economic conditions, demand for an Expansionary Monetary Policy the central bank cuts down the CRR. The effect on the supply of money and credit due to the change in CRR is explained below:

Suppose a commercial bank has total deposits of Rs 150 million and CRR is 20%. It means a bank can loan Rs 120 million ($150 \times 20/100 = 30$ million), and the credit of deposit multiplier is equal to Five (*deposit multiplier, $Dm = 1/CRR = 1/0.20$*). This means a bank can create, through a credit multiplier a total credit of Rs 750 million (150×5) or an additional credit of Rs 600 million (120×5).

Now, if the central bank decides to curb the supply of money to the public raises the CRR to 25%. The credit multiplier will go down to Four ($1/0.25$). By doing so, the commercial bank can now only give a loan of Rs. 112.5 million ($150 * 0.25 = 37.5$ million). Thus, the total credit created by the commercial bank will go down to Rs 600 million ($150*4$), and the additional credit goes down to Rs 450 million ($112.5 * 4$). A fall in the bank credit by Rs 150 million will have a great impact on the money market. The cash reserve ratio method is more handy and effective where the open market operations and bank rate policy proves to be ineffective. However, its efficiency with respect to its impact on the capital market depends on the banking credit share in the credit market. In addition to CRR, the central bank has imposed another kind of reserve called as Statutory Liquidity Ratio (SLR).

Cash Reserve Ratio is one of the components of the monetary policy of the Central Bank of Nigeria which is used to regulate the money supply, level of inflation and liquidity in the country. The higher the CRR, the lower is the liquidity with the banks and vice-versa.

During high levels of inflation, attempts are made to reduce the money supply in the economy. For this, RBI increases the CRR, sucking the loanable funds available with the banks. This, in turn, slows down investment and reduces the supply of money in the economy. As a result, the growth of the economy is negatively impacted. However, this also helps bring down inflation.

Manufacturing Sector Output

The manufacturing sector industry played a significant role in the transformation of the economy for example; it is an avenue for increasing productivity related to import replacement and export expansion, creating foreign exchange earning capacity; and raising employment and per capital income which causes unique consumption patterns. Furthermore, Ogwuma (1995) opines that it creates investment capital at a faster rate than any other sector of the economy while promoting wider and more effective linkages among different sectors. Acknowledge this benefit of this sector; the Nigerian government has introduced various strategies to bust the sector such as import substitution strategy, export promotion strategy, the introduction of bank of industry to induced credit facility to the sector and the National Economic Empowerment and Development Strategy (NEEDS).

Loto (2012) revealed that the Structural Adjustment Programme (SAP) introduced in May 1986 was partly designed to revitalize the manufacturing sector by shifting emphasis to increased domestic sourcing of inputs through monetary and fiscal incentives. The deregulation of the foreign exchange market was also effected to make non-oil exports especially manufacturing sector more competitive even though, this also resulted in massive escalation in input costs. Examining the manufacturing sector over the years in Nigerian economy shows that the share of the manufacturing sector in the gross domestic product has not been impressive. The manufacturing sector contributes 34.94% to gross domestic product in 1986 after the structural adjustment programme. By 1990 and 1995 it decline to 22.84% and 10.17% respectively. The contribution of the Nigerian manufacturing sector to Gross domestic product is very insignificant between 1996 to 2012. The year 2000, 2005 and 2012 recorded 6.97%, 2.80% and 1.88% respectively. The insignificant contribution of the sector to gross domestic product is as a results of continues deterioration in infrastructural facility especially the power sector. The growth rate of manufacturing sector has not been very impressive. The highest growth rate was recorded in 1988 during the SAP period. In fact negative rate was experience in 2002, 2003 and 2004

Theoretical Framework

This study is anchored on the Quantity Theory of Money by Irving Fisher's (1920) which state that the quantity of money is the main determinant of the price level or the value of money. Any change in the quantity of money produces an exactly proportionate change in the price level in the words of Irving Fisher, "Other things remaining unchanged, as the quantity of money in circulation increases, the price level also increases in direct proportion and the value of money decreases and as the quantity of money in circulation decreases, the price level also decreases in direct proportion and the value of money increase." If the quantity of money is doubled, the price level will also double and the value of money will be one half. On the other hand, if the quantity of money is reduced by one half, the price level will also be

reduced by one half and the value of money will be twice. The quantity theory was first developed by Irving Fisher and is a basic theoretical explanation for the link between money and the general price level (Nasko, 2016). The quantity theory of money posit that short-run monetary control can be achieved by interest rates which were sticky but in the long-run the demand of influence was real cash balance (Irving Fisher, 1932). Fisher further assumed that the rise in commodity prices would precede the increase in interest rate which was regarded as main channel of the firms operation cost. Fisher also formulates his equation of exchange and specified that;

$$MV=PT \text{-----} (2.1)$$

Where m is the actual money stock, V is the transaction velocity of circulation of money, p is the average price level and T is the number of transaction made per the period. He contends that if the velocity of money changes the supply of money affects prices. An increase in the velocity of circulation will give rise to a proportionate increase in prices and vice versa, with M and T being constant. Prices rise because money moves faster to chase the same quantity of goods. Interest rate affect the velocity of money as rising interest rates and consequently prices will lead buyers to economise on their holdings of money, thus reducing the turnover of money. Fisher, imposes the assumption that the equilibrium values of V , and T will be fairly constant in the short run and invariant with respect to change in the quantity of money. Given the assumption, equation (1) can be re-written as;

$$Mv=PT \text{-----} (2.2)$$

Where bars (-) signify that v and t are constant. Given that m is exogenous, there must be proportional relationship in equilibrium between money supply (m) and the general price level. The quantity theory of money with a simple growth model, the quantity theory of money is based on the link between the stock of money (M) and the market value of output that it finances (PY), where p is the price level and y is the output. M is related to p with a factor of proportionality k , the relationship is given by:

$$M=kPY \text{-----} (2.3)$$

$$M/p=KY \text{-----} (2.4)$$

K is assumed to be constant

Equation (2) can actually be written as;

$$MV=PY \text{-----} (2.5)$$

Where $V= 1/k$ and this is the income velocity of money, the ratio of money income (nominal GDP) to the number of times the stock of money turns over in a given period in financing the flow of nominal income. The scenario here is that with the quantity theory, there is a link between monetary policy tools, money supply, it's velocity of circulation and general price level of the Industrial sector output. Therefore, V as income velocity of circulation of money is a very useful concept for monetary policy formulation.

Empirical Review

Osakwe , Ibenta and Ezeabasili (2019) examined the effect of monetary policy on the performance of the Manufacturing sector in Nigeria. The explanatory variables are monetary policy rate, Treasury bills rate, Cash reserve requirement and money supply; while the dependent variable is the Manufacturing (MANU) sector output. The study adopted an ex-post facto research design and used secondary data obtained from the CBN Statistical Bulletin. The study covered a period of 32 years (1986 to 2017). The data were subjected to Augmented Dicker Fuller stationarity test to determine the best suitable econometric tool of analyses. The Autoregressive Distributive Lag (ARDL) was used for the model estimation. The results indicate that: monetary policy tools have significant effect on the manufacturing sector output in Nigeria in the short run only.

Egbulonu and Ukwuoma, (2018) studied the impact of monetary policy on the growth of the manufacturing sector in Nigeria from 1980-2016. Secondary data were used for the study and were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin 2016 edition. Manufacturing sector's output was used as the dependent variable while Money Supply, Exchange rate and Interest rate were the independent variables. The test for stationarity of the data showed the data are integrated of mixed order thereby necessitating the Bounds test for cointegration. The bounds test confirmed the existence of a long

run relationship amongst the variables. Analyses of the data was done using the Autoregressive Distributive lag model which estimated both the short run and long run forms of the model. The result showed that money supply has a positive and significant impact on manufacturing output in Nigeria in the short and long run. Exchange rate on the other hand remained negative both in the short and long run and not statistically significant. Interest rate was positive in the short and long run but not a significant determinant of manufacturing output.

Hillary, Imo and Uche (2018) assessed the industry effects of monetary policy transmission channels in Nigeria within the period 1981-2014. Techniques of analysis employed in the study are the Johansen cointegration and the error correction model (ECM). Our regression estimates reveal that the private sector credit, interest rate, and exchange rate channels have negative effects on real output growth, both in the long run and in the short run. The results further show that, relatively, the degrees of the established effects are higher in the long run than in the short run. We employed the Johansen cointegration approach to determine the nature of relationship that exists between our dependent variable and the independent variables. The results show that, in the Nigerian case, monetary policy transmission channels jointly have a long-run relationship with real output growth of the industrial sector, and disequilibrium in the system is corrected at the speed of 72.2% annually

Lawrence, Odimgbe and Ezeabalisi, (2018) investigated the effect of monetary policy on economic growth in Nigeria. The natural log of the GDP was used as the dependent variables against the explanatory monetary policy variables: monetary policy rate, money supply, exchange rate, lending rate and investment. The time series data is the market-controlled period covering 1986 to 2016. The study adopted an Ordinary Least Squared technique and also conducted the unit root and co-integration tests. The study showed that long run relationship exists among the variables. In addition, the core finding of this study showed that monetary policy rate, interest rate, and investment have insignificant positive effect on economic growth in Nigeria. Money supply however has significant positive effect on growth in Nigeria. Exchange rate has significant negative effect on GDP in Nigeria. Money supply and investment granger cause economic growth, while economic growth causes interest rate in Nigeria.

Onyeka, Nnado and Iroegbu (2018) examined the relationship between cash (including liquid substitutes) and profitability of listed firms in the manufacturing sector of the Nigerian Stock Exchange. Ex-post-facto research approach via quantitative panel methodology was employed to evaluate the effect of the cash and cash equivalents on the dependent variable. Data were collated from the audited annual reports of thirty-six (36) manufacturing firms listed on the Nigerian Stock Exchange for the fifteen year period: 2003-2017. Diagnostic tests were carried out on the collated data using Levin-Lin-Chu panel unit-root test which confirmed their stationarity and Westerlund Panel Cointegration Tests that depicted the variables were not cointegrated in the long run. Further, Hausman test confirmed the consistency and suitability of the Fixed Effects (FE) multiple regression model. Hypothetical statements tested portrayed the existence of a significant positive influence of cash and cash equivalents on return on assets of the sampled firms. These results imply that optimizing firms' profits necessitate striking the best liquidity-profitability trade-offs, otherwise firms keeping insufficient liquid assets may be forced to borrow from external sources at exorbitant costs or become illiquid.

Egbulonu and Ukwuoma (2018) this research studied the impact of monetary policy on the growth of the manufacturing sector in Nigeria from 1980-2016. Secondary data were used for the study and were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin 2016 edition. Manufacturing sector's output was used as the dependent variable while Money Supply, Exchange rate and Interest rate were the independent variables. The test for stationarity of the data showed the data are integrated of mixed order thereby necessitating the Bounds test for cointegration. The bounds test confirmed the existence of a long run relationship amongst the variables. Analyses of the data was done using the Autoregressive Distributive lag model which estimated both the short run and long run forms of the model. The result showed that money supply has a positive and significant impact on manufacturing output in Nigeria in the short and long run. Exchange rate on the other hand remained negative both in the short and long run and not statistically significant. Interest rate was positive in the short and long run but not a significant

determinant of manufacturing output. The research concluded that despite the existing interest rate and money supply, manufacturers still borrow funds for production but this has not related to a significant growth in manufacturing sector's output in Nigeria. Based on the findings, the researcher recommended amongst others that monetary authority should avoid policy inconsistencies to enable long term business planning and investment by manufacturers in Nigeria. Again the Federal government under the current managed flexible exchange rate regime should formulate policies that will strengthen the domestic currency (Naira) against the global market currency (US Dollars); policies such as diversifying the productive base of the economy, encouraging the patronage of locally produced goods etc. will go a long way towards strengthening the local currency and the manufacturing sector

Ebikila, Agada, Lucky, and Matthew (2018) examined the impact of money supply on macroeconomic variables in Nigeria from 1985 to 2016. The specific objectives of the paper were to ascertain the impact of narrow money supply, broad money supply, inflation rate, and exchange rate on real gross domestic product on one hand, and narrow money supply, broad money supply and exchange rate on consumer price index in Nigeria. The ex post facto research design and descriptive statistics were used to observe the variables in retrospect. To avoid spurious results, the Augmented Dickey Fuller test was used to solidify the data, which integrated at first difference I(1). The ordinary least square technique was employed to determine the magnitude and direction of the variables in the models. It emerged that narrow money supply has a positive and significant impact on inflation and per capita income; conversely, broad money supply does not have any significant impact on inflation and real gross domestic pro per capita income. Empirical evidence further showed that exchange rate has an insignificant impact on inflation and per capita income. Inflation rate on the other hand, has an inverse and statistically insignificant impact on per capita income in Nigeria.

Summary of Empirical Literature

The empirical review of the effect of monetary policy on manufacturing output has shown conflicting findings. A number of the findings posit significant influence from monetary policy especially the moderating effect of money supply (Onyeiwu, 2012; Fasanya, *et al* 2013; Owolabi & Adegbite, 2014; Okonkwo *et al* 2015; Adigwe *et al*, 2015; Apinran, 2016; Srithilat & Sun, 2017; Ahmad, *et al* 2016; Ufoeze, *et al* 2018). Despite agreeing that monetary policy instruments enhances manufacturing sector output, these studies are at variance to the direction of the effects. For instance Srithilat and Sun (2017) and Ezeaku, *et al*, (2018) averred that all the variables of monetary policy it employed has a negative effect on manufacturing sector in both long and short run which implies that growing money supply and credit extension will rather hamper manufacturing in Nigeria; as against the belief from studies like Onyeiwu (2012), Adigwe *et al* (2015) and Ahmad, *et al* (2016) that monetary policy instruments enhances manufacturing sector output in the economy.

A number of studies out rightly argued that monetary policy has no effect on the manufacturing sector (Danjuma, 2013; Okulegu, *et al* 2013; Udude, 2014; Chipote & Makhetha-Kosi, 2014; Anowor and Okorie, 2016; Goshit & Longduut, 2016). These studies fund that money supply has insignificant effect on the manufacturing sector output (Okulegu, *et al* 2013; Udude, 2014; Chipote & Makhetha-Kosi, 2014) and Anowor and Okorie (2016) noted that monetary policy rate and cash reserve requirement are not statistically significant tools for enhancing manufacturing

METHODOLOGY

Research Design

The study employed an *ex-post facto* research design because the data for the study were secondary data which were obtained from Central bank of Nigeria Statistical Bulletin, 2020. The dependent variable is the manufacturing sector output. The independent variables are the monetary policy instruments (tools) that determine the direction of economic performance in Nigeria. Following the market-based economic trends, the data for monetary policy is anchored on the market-based instruments which include monetary policy rate (MPR), Treasury bill rate (TBR), Cash Reserve Requirement (CRR). Since the Broad Money

Supply (M_2) is the vehicle for monetary policy transmission, the M_2 is included to control for monetary policy stance.

Model Specification

The general bases for model specification is the quantity theory of money which posits that the velocity at which money is distributed has macroeconomic implication for an economy. This presupposes that monetary policy instruments can influence manufacturing sector output.

The model for the study will be adopted from the work of Alagh and Emeka (2014).

Their model is stated thus:

$$MANU = f(MPR, TBR, CRR)$$

Where:

MANU = Contribution of manufacturing subsector output to Gross Domestic Product.

MPR = Monetary policy rate

TBR = Treasury Bill Rate

CRR = Cash Reserve Ratio

The model will be modified by introducing ratio of broad money supply as a new variable, thus:

$$MANU = f(MPR, TBR, CRR, M_2)$$

Where:

MANU = Contribution of manufacturing subsector output to Gross Domestic Product.

MPR = Monetary policy rate

TBR = Treasury Bill Rate

CRR = Cash Reserve Ratio

M_2 = Ratio of broad money supply to Gross Domestic Product.

The Econometric Equation Form of the Model is:

$$MANU = b_0 + b_1MPR + b_2TBR + b_3CRR + b_4M_2 + \varepsilon \quad \text{----} \quad \text{----}1$$

b_0 is the constant while b_{1-4} are the coefficients of the explanatory variables (MPR, TBR, CRR and M_2). ε is the error term.

Method of Data Analyses

The data will be analyzed with econometric techniques such as Descriptive Statistics, Augmented Dickey Fuller Tests for Unit Roots, The Autoregressive Distributive Lag (ARDL) Approach. The Autoregressive Distributive Lag (ARDL). Bounds test for cointegration will be applied. The nature of the Autoregressive Distributive Lag (ARDL) long run relationship and speed of correction to equilibrium and the Autoregressive Distributive Lag (ARDL) short run relationship will be used for the data analysis using E-view

DATA PRESENTATION AND ANALYSIS

Unit Root Test

Table 1: Summary Unit Root test for Stationarity

Variables	At Level 1(0)	At First Difference 1(1)	At Second Difference	Order of Integration	Probability
MANU	-3.730558			1(0)	0.0039
MPR	-4.561864			1(0)	0.0112
TBR	-3.595801			1(0)	0.0046
CRR	-5.814004			1(0)	0.0022
M_2	-4.340303			1(1)	0.0048

Source: Eviews 9.0

The variables were tested for stationarity. The test aimed at understanding the state at which the variables can be held stable for regression analyses. This test becomes pertinent because time series variables are often prone to non-stationarity which is capable of distorting the reliability of regression results. The

variables used in the analysis were subjected to Augmented Dickey Fuller (ADF) Tests, to determine whether they are stationary series or non-stationary series. The result of the stationarity test indicate that MANU, MPR, TBR and CRR were stationary at [1(0)] while and M_2 were stationarity at first difference [1(1)]. From the analyses of stationarity of the variables, it was seen that the variables have mixed stationarity of level and first differences. The Autoregressive Distributive Lag (ARDL) approach which is capable of handling both stationary at level I(0) and first difference I(1) were used for the data analysis. Thus, the most suitable tool of analyses is the ARDL test that accommodates both the short and long run trends in testing the relationship between the dependent and independent variables.

ARDL (Bounds) Test for Cointegration

Table 2. Result of the ARDL (Bounds) Test for Cointegration Monetary Policy and Manufacturing Sector Output in Nigeria

ARDL Bounds Test

Date: 11/04/21 Time: 13:31

Sample: 1987 2019

Included observations: 32

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	4.807187	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	3.01
2.5%	3.25	4.49
1%	3.74	4.06

Source: Eviews 9.0

The bound test is shown in Table 3. The result is compared the F-statistics with the critical bound values. The F-statistics is 4.807187. The results showed that the F-statistic is greater than the lower bounds at 2.86 and upper bounds at 3.01 of the critical values at 0.05 level of significance. The implication is that there is a cointegration or long run relationship between monetary policies on manufacturing sector output in Nigeria

Nature of ARDL Long Run Relationship and Speed of Correction to Equilibrium

Table 3: Model of the Long Run Relationship Between Monetary Policy and Manufacturing Sector Output in Nigeria 1987- 2019

ARDL Cointegrating And Long Run Form

Dependent Variable: MANU

Selected Model: ARDL

Date: 11/04/21 Time: 15:35

Sample: 1987 2019

Included observations: 32

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MPR)	0.440569	0.260218	1.693073	0.0029
D(TBR)	0.075244	0.100613	2.747855	0.0615
D(CRR)	0.013770	1.252775	0.010991	0.9913
D(M2)	-0.743069	0.402146	1.847758	0.0765
CointEq(-1)	-5.816499	0.163788	-2.079510	0.0339
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MPR	1.293514	0.751385	1.721506	0.0975
TBR	0.040428	3.679439	0.010987	0.9913
CRR	-2.181658	1.307951	-1.667997	0.1078
M2	1.220574	1.545133	0.789948	0.4370
C	3.113743	11.418334	0.272697	0.7873

Source: Eviews 9.0

Having found the presence of long run relationship between monetary policy on manufacturing sector output in Nigeria from result of the bound test, further analyses presented in table 6 explained the nature of the long run relationship. The results showed that the error correction term [cointeq(-1)] is rightly signed. The coefficient of the error term is -5.816499 with probability value of 0.0339. Since the p.value is less than 0.05, it connotes that the error term is statistically significant. This indicates that changes in the trend of manufacturing sector output in Nigeria will eventually return on a growing normal trend over time. The coefficient indicates that about 580% of the deviations on s manufacturing sector output in Nigeria due to instability in monetary policy can be corrected within a year. This implies that monetary policy variables model can be used to stabilize s manufacturing sector output in Nigeria. This suggests that monetary policy variables has a significant policy adjustment effect on manufacturing sector output in Nigeria within the period under review

Short Run Relationship

Table 4: Short Run Model of the Relationship Between Monetary Policy and Manufacturing Sector Output in Nigeria

Dependent Variable: MANU

Method: ARDL

Date: 11/04/21 Time: 15:34

Sample (adjusted): 1987 2019

Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
MANU(-1)	0.659402	0.163788	3.025955	0.0005
MPR	0.440569	0.260218	2.693073	0.0029
TBR	-0.075244	0.100613	-0.747855	0.4615
CRR	0.013770	1.252775	2.010991	0.0013
M2	-0.743069	0.402146	-1.847758	0.3765
C	1.060535	3.969493	0.267171	0.7915
R-squared	0.679881	Mean dependent var		6.171040
Adjusted R-squared	0.649053	S.D. dependent var		1.323823
S.E. of regression	0.955491	Akaike info criterion		2.937457
Sum squared resid	22.82408	Schwarz criterion		3.258087
Log likelihood	-39.99932	Hannan-Quinn criter.		3.043737
F-statistic	5.751165	Durbin-Watson stat		2.167160
Prob(F-statistic)	0.000718			

Source: Eviews 9.0

The short run effect of monetary policy on manufacturing sector output in Nigeria is explained in the result in Table 7. The analyses are interpreted based on the coefficient of the explanatory variables, and the coefficient of determination (R²). The statistical significance is confirmed using the t-statistics for the coefficient of regression, and F-statistics for the coefficient of determination.

Manufacturing Subsector Output (MANU): The results showed that the coefficient of manufacturing subsector output is positive at 0.659402 with t-Statistic of 3.025955 and probability value of 0.0005 which suggest that manufacturing subsector output has positive and significant effect on the model at 0.05 level of significance. This implies that manufacturing subsector output is an endogenous variable in the explanation of the effect of monetary policy on manufacturing sector output in Nigeria in the short run

Monetary Policy Rate (MPR): The coefficient of monetary policy rate (MPR) is positive at 0.440569 with t-Statistic of 2.693073 and probability value of 0.0029 which means that monetary policy rate has positive and significant effect on manufacturing sector output in the short run

Treasury Bill Rate (TBR): The coefficient of treasury bill rate (TBR) is negative at -0.075244 with t-Statistic of -0.747855 and probability value of 0.4615 which means that treasury bill rate has no significant effect on manufacturing sector output in the short run

Money Supply (M2): The coefficient of money supply (M2) is positive at 0.013770 with t-Statistic of 2.010991 and probability value of 0.0013 showing that money supply has significant effect on manufacturing sector output in the short run

CONCLUSION

The result of the study indicates that manufacturing subsector output is an endogenous variable in the explanation of the effect of monetary policy on manufacturing sector output in Nigeria in the short run, monetary policy rate, money supply has positive and significant effect on manufacturing sector output in

the short run while treasury bill rate has no significant effect on manufacturing sector output in the short run

RECOMMENDATIONS

The recommendations of the study are as follows:

1. Since money supply was seen to have positive effects on manufacturing sector outputs, the study recommended that the CBN should employ an expansionary monetary policy that can increase the money supply to the real sectors and boost performance of the Nigerian economy.
2. The study recommended that the CBN should reduce the MPR to attract low interest rates that can encourage credit and boost productivity across the sectors in Nigeria.
3. As seen from the results, the various monetary policy tools have diverse effects on manufacturing outputs in Nigeria. Thus, this study recommends that the CBN should employ different set of monetary policy directives under guided deregulation for each of the sectors in Nigeria.
4. Since this study found that cash reserve requirements (CRR) has not significant effect on manufacturing sector output, this study recommends that financial institutions, especially the Deposit Money Banks, should not be constrained by CRR as this might hinder growth in the economy.

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