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# MONETARY POLICY AND ECONOMIC PERFORMANCE IN NIGERIA: AN INDUSTRIAL SECTOR ANALYSIS

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## ABSTRACT

*This paper examined the nexus between monetary policy and economic performance in Nigeria from the stand point of industrial sector from 1990 - 2022. The industrial sector is vital to the growth of any economy as it has reflected in the economic performance of the Asian Tigers. The significance of this paper is that it addressed vital elements of industrial sector performance which other works have not examined. The dependent variables for this study were industrial employment rate (INE) and industrial growth rate (IDG) while the independent variables were cash reserve ratio, liquidity ratio, exchange rate, broad money supply, treasury bill, and monetary policy rate. The Autoregressive Distribution Lag (ARDL) was employed and the results indicated that on the part of the industrial sector growth rate, Cash Reserve Ratio (CRR), Exchange Rate (EXR), inflation Rate (INF), Liquidity Rate (LR) and Broad Money Supply (BMS) all have negative impact but EXR and INF are statistically significant. However, Monetary Policy Rate (MPR) and Log of Treasury Bill (LOGTRB) have positive effect on industrial sector growth rate but they are not statistically significant. On the other hand, the findings from the industrial sector employment rate showed that INF, LR, BMS and LOGTRB are inversely related to the employment capacity of industrial sector but not statistically significant. CRR, EXR and MPR have positive effect on the sector's employment rate with CRR and MPR being statistically significant. The only independent variable that has a positive effect on both dependent variables is MPR. This indicates that monetary policy rate is the only vital tool that can enhance the economic performance through IDG and INE. This study recommended the use of MPR to navigate the economy through the industrial sector.*

**Keyword: Monetary policy, Industrial Sector Growth Rate, Industrial Sector Employment Rate, Economic Performance, Nigeria**
***JEL classification:*** **E52, L60, J21, O55**

## 1.0 INTRODUCTION

The attainment of economic prosperity remains one of the focal point of every economy irrespective of its levels of economic growth and development. The industrial sector is the driver of any economy that aspires to be self-sufficient and self-reliant. In the views of Ayunku and Olulu-Briggs (2020), industrial sector transforms raw materials into finished goods. Industrial sector accelerates the pace of economic well-being through diversification and transformation. It reduces a country's dependence on foreign supplies (Bakare-Aremu & Osobase, 2015). This sector navigates the economy from a state of subsistence to a technological driven economy. By its very activities, it links the agricultural and service sectors of the economy. Industrial sector as the engine of production, builds up a nation's capacity for greatness (Ezu, Jeff-Anyeneh & Ogbonnaya-Udo, 2020; Ndiyo & Ebong, 2020). The industrial sector is vital for employment generation, economic growth, poverty alleviation, improvement in living condition, balance of payment and growth of other sectors (Inyang, Effiong & Udofia, 2022; Otchia & Yamada, 2021; Muzammil, 2020; UNIDO, 2020; Eneji, Tangka, Eneji, Haruna, & Uzochukwu, 2020; Onyenebo, 2018).

According to the CBN (2022), sectoral groupings are the agricultural, industrial and service sectors. The industrial sector includes mining and quarrying, construction, manufacturing, water supply, sewage and waste management and electricity, gas, steam and air conditioner (CBN, 2022). In the opinion of Dada (2023); Onyenebo (2018) industrial sector consists of micro, small and medium enterprises. This sector has become one of the flourishing sectors globally (Kutu, Nzimande & Msoni, 2017). The level of industrial development is measured by the manufacturing value added (MVA) per capita which is a reflection of outputs produced by the manufacturing sector in relation to the country's population size (UNIDO, 2020). Improving industrial performance requires a radical shift and structural change. Structural change is driven by technological innovation, development of new economic roadmap, capital and labour uses and changes in the pattern of production and consumption. Developing economies can catch up with developed economies through structural transformation (Ibitoye, Ogunoye & Kleynhans, 2022; Ndiaya & Lv, 2018; Altenburg, 2011). In the views of Zhang (2015); Hu and Khan (1997), the success of the Chinese economy is attributed to industrial revolution. The African Union Commission (AUC, 2015) noted that industrialisation would transform Africa's economies by 2063.

Monetary policy has proved to be efficient and effective in the management of macroeconomic instability globally (Husseiny, 2023; Zhou, Wang, Gao & Wang, 2022; Saqib & Aggarwal, 2017; Nwaogwugwu & Evans, 2016; Mishkin, 1995). Monetary policy touches our national life (Kalu, Ogbonna & Paul, 2015). The impact of

monetary policy on economic performance differs from country to country and from sector to sector. Monetary policy is a deliberate action taken by a country's monetary authority to control the cost of, value and supply of money in the economy aimed at achieving macroeconomic objectives. In the opinion of Adekunle (2021) monetary policy is a regulatory framework designed to regulate economic activities. Monetary policy is a component of economic strategies and planning that provide a healthy atmosphere to achieve economic development and improved welfare of the general public (Mehar, 2023).

The weak performance of this sector has contributed to the country's economic woes. Government has made spirited efforts towards the improvement of the sector (Beyene & Singh, 2019). Many studies have investigated the impact of fiscal policy on the industrial sector (Oladipo, Joshua, Machi, Yusuf, & Afamefuna, 2023; Olasehinde & Omolade, 2022; Ozuzu & Isukul, 2021; Ighoroje & Akpokerere, 2021; Effiong & Essien, 2020; Iweriebor, Egharevba & Adegboye, 2015) to the neglect of monetary policy. Globally, monetary policy influences investment in the industrial sector through the transmission mechanism of exchange rate, interest rate and credit channel (Abile & Mpuure, 2020; Leith, Meldovan & Rossi, 2015; Ganley & Salmon, 1997). According to UNIDO (2020), industrialisation has lifted millions of people out of poverty. The sector generates about 12% employment annually in India and it has contributed to the reduction of poverty in China (Manjula, 2022; Chen, 2020). The question that arises is can monetary policy improve the performance of industrial sector in Nigeria? In an attempt to answer this question, this study therefore examines the impact of monetary policy on industrial sector performance in Nigeria with specific objectives of ascertaining the effect of monetary policy on industrial sector annual growth rate and employment generation. Having gone through the available works in relation to this study in Nigeria, evidence shows that these research works are few and have focused on industrial sector contribution to GDP neglecting other variables. This has created an empirical gap which this study wishes to address. This study is unique in a number of ways. First, two hypotheses were developed to test the performance of the industrial sector. Secondly, broad money supply and treasury bill were captured as part of the independent variables. Thirdly, it will be contributing to the number of empirical works on the subject matter from 1990 to 2022.

**Nigeria's Industrial Sector Performance**

Studies on the performance of Nigeria's industrial sector dates back to 1914 (Chukwu, 2022). The dismal performance of this sector has limited the growth potential of the economy (Ezeji & Okonkwo, 2014; Bokosi, 2022). The industrial sector's contribution to the growth of the economy has not been impressive compared

to other sectors (Chete, Adeoti, Adeyinka & Ogundele (n.d)). The sector's highest contribution to GDP was 37.71% in 1992. Its worst growth rate was -8.85% in 2016 and its highest percentage of employment stood at 12.66% in 2021 and 2022. In 33 years average growth rate and employment rate were 1.56% and 11.53% respectively. The manufacturing sub-sector has been the major driver of the sector. Industrial sector performance can be evaluated through value added by the sector, the level of capital formation, employment generated, structural changes and product coverage (Simon-Oke & Awoyemi, 2010).

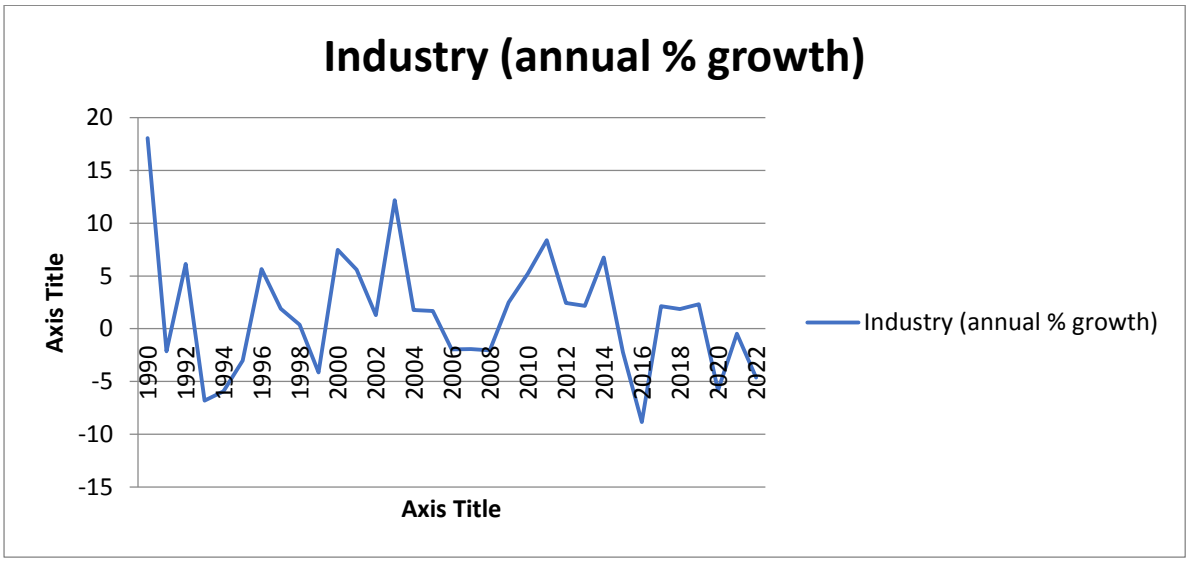


**Figure 1: Annual growth rate of the industrial sector from 1990 – 2022.**

**Authors' compilation (Source: WDI)**

## 2.0 Monetary policy and industrial sector performance: An Empirical Review

There are divergent views on the impact of monetary policy on industrial sector performance in Nigeria. Ezeaku, Ibe, Ugwuanyi, Modebe and Agbaeze (2018) investigated the transmission mechanism of monetary policy channels on industrial sector in Nigeria between 1981-2014 using Johansen cointegration and error correction model. The results showed that the dependent variable (real output) was negatively affected by all the independent variables (credit channel, interest rate and exchange rate) in the short and long run while noting that the effect of the independent variables on the dependent variable are lower in the short run than in the long run. The ECM revealed that the speed of adjustment in the system was 72.2% annually. Bakare-Aremu and Osobase (2015), examined the impact of stabilisation policies on manufacturing sector performance in Nigeria using error correction model. The method of analysis adopted by the study was the ordinary least square technique. The Johansen cointegration test revealed the existence of long run relationship between the dependent variable (GDP) and independent variables (monetary and fiscal policies). The study concluded that stabilisation policies are vital to the growth of the industrial sector.

In the works of Asiagwu, Utalor and Anaele (2021), monetary policy improves industrial and economic growth. The study utilised data from 1996-2019 and employed Ordinary Least Square (OLS), descriptive statistics, granger causality and Augmented Dickey Fuller. The need to review monetary policy instruments to better the performance of the sector was the study's recommendation.

Beyene and Singh (2019), looked at the role of monetary policy on Ethiopia's industrial growth. The bond test confirmed the existence of long run relationships between the variables. The independent variables used for the study were interest rate, broad money supply growth rate, inflation rate and nominal exchange rate while the dependent variable was industrial output. Findings revealed that all the variables except interest rate had a significant impact on industrial growth in the long run. The error correction techniques showed that there is a possibility of disequilibrium adjusting at a speed of 70% in subsequent period. The study concluded that the axiom of non-neutrality of money does not exist. The paper recommended the need to thoroughly examine monetary policy action in order to achieve industrial growth. Ghosh (2009) examined industrial output and monetary policy in India between 1981-2004. The study adopted Vector Autoregressive Model. Three sets data used for the study were industries two-digit level, macro and monetary variables and trade union membership. Findings from the study discovered that contractionary monetary policy affects industries differently while financial accelerator and interest rate were useful in explaining the reasons for the differences. Kutu, Nzimande and Msomi (2017) aimed at determining how the growth of the China's industrial sector can be enhanced through the effectiveness of monetary policy. The dependent variable for the study was industrial output production while the independent variables were interest rate, exchange rate, inflation rate and money supply. The study also empirically investigated the steady-state of monetary policy and industrial sector growth. Using monthly time series data from 1994-2013 and employing Autoregressive Distribution Lag (ARDL) and Error Correction Model (ECM), the outcome of the analysis showed that industrial sector growth is significantly affected by the effectiveness of monetary policy in the short run. Matola (2023) while investigating the relationship between monetary policy and industrial production in Malawi using monthly data from 04/2004-05/2016. The study used industrial output, consumer price index, inflation, exchange rate, monetary base, policy rate, lending rate bank loans and money supply as the variables for the study. The methodology employed were the ARDL bond test, Conditional Error Correction model, Least Squares with breakpoints and VAR model discovered that contractionary monetary policy had a negative impact on industrial output in the short run and long run. The study further revealed that monetary policy transmission mechanism to the industrial sector is achieved through money supply and interest

rate channels. It was recommended that prolonged use of contractionary monetary policy limits the growth of the sector.

Akanbi and Dada (2018) examined the effects of monetary policy shocks on industrial sector in Nigeria from 1986-2015 employing ARDL econometric model. The independent data for the study was industrial output while the dependent variables were broad money supply, inflation and interest rate. The Evidence showed that monetary policy shocks had negative impact on industrial output in the short run and long run. The study recommended that monetary policy should be applied with caution. Shobande (2019) while investigating the effects of migrating from direct to indirect monetary policy on industrial sector growth in Nigeria using an ARDL bond test to estimate the relationship between the dependent variable (industrial output) and independent variables (domestic credit, interest rate, trade balances, money supply, inflation and exchange rate). Results obtained from the study shows that in the long run, the dependent variable have positive relationship with trade balance, domestic credit and interest rate while exchange rate, money supply and inflation impacts negatively on the dependent variable. Variations in indirect monetary policy in preceding years had negative effects on industrial output in the short run. The study recommended conventional and non-conventional monetary policy in order to improve growth in industrial output. In the work of Ubi, Lionel and Eyo (2012) while deploying time series variables of money supply, total reserve, interest rate, balance of trade, exchange rate and industrial output, found out that the independent variable are statistically significant on industrial output. In their submissions, monetary authority should ensure that monetary policy is in line with prevailing economic situation.

## Theoretical Review

### Classical Theory of Monetary Policy

According to the classicalists, money has a neutral effect on the economy but affecting only price. In their view, money only serves as a medium of exchange and nothing more. The basis of the classical view on monetary policy was anchored on the equation of exchange developed by Irving Fisher. The equation of exchange which is used to explain the Quantity Theory of Money (QTM) is expressed as MV = PT. In the equation, PT represents the current market value of goods and services (nominal GDP) which equal money supply (M) and the velocity of exchange (V). The theory holds that if V and T are held constant, the equation becomes M = P. This implies that there is a direct and proportional relationship between money supply (M) and general price level (P). As the volume of money supply increases/(decreases), price will also increase/(decrease). In the classical analysis, there is complete absence of trade-off between aggregate output and inflation. In the classical view, money supply is fixed and exogenously determined by the central monetary authority. The classicalists further hold the views that

market forces will in the long run lead the economy into full employment.

**Monetarist Theory of Monetary Policy**

According to the monetarists, money is a vital instrument used in directing, controlling and influencing macroeconomic variables aimed at improving economic activities. They are of the views that monetary authority should adopt an effective monetary policy to address economic instability. The position of the monetarists on monetary policy was a hybrid between the Keynesians and the classicalists. The monetarists hold the same view as the Keynes that the economy is not always at its full employment level in the short run and suggested the use of loose monetary policy to boost economic activities in the long run. Like the classicalists, the monetarists suggested that to curb inflation in the economy, monetary authority should control the growth in money supply as inflation is seen as monetary phenomenon.

**Keynesian Theory of Monetary Policy**

John Maynard Keynes in his book The General Theory of Employment, Interest and Money in 1936 proposed the Keynesian Theory of Monetary Policy. Keynes rejected the positions of the classical economists on the grounds that money is not neutral in the economy; the velocity of money (V) cannot be constant and money supply and price level are not directly proportional. Keynes in his analysis believes that monetary policy is vital to the growth and sustenance of the economy. According to Keynes, altering money supply affects income, interest, output, employment and aggregate demand. Keynes acknowledged the importance of investment multiplier, interest rate and marginal efficiency of capital in the application of monetary policy. Keynes further addressed the issue of unemployment in the economy which he believes can be resolved in the long period through monetary policy. Twinoburyo and Odhiambo (2018) noted that in Keynes liquidity preference, demand for money is endogenous and not exogenous which depends on rate of interest and income. According to Keynes equilibrium level of money is determined by the interaction of demand and supply of money. Consumption and investment are influenced by adjustments in interest rates which causes a shift in output and prices. An expansionary monetary policy increases money supply in the economy, encourages investment and consumption which forces employment and output to increase. Improving the performance of the industrial sector is closely connected to monetary policy which the monetary authority uses to allocate scarce resources in order to improve production and output. The Keynesian's further noted that when the economy does not align with the Walrasian general equilibrium, both monetary and fiscal policies will be applied to improve on the performance of the economy. This paper is anchored on the Keynesian theory of monetary policy.

**Endogenous Growth Model**

According to this theory of economic growth, the growth rate of any economy is a result of

internal factors rather than external factors as postulated by the neoclassical theorists. The theory is based on the understanding that positive economic outcome such as increase in productivity takes through increase in knowledge, improvement in innovation and human capital development. The theory ascertained that long run economic growth is achieved by increase in output per individual. Increased output per person is only possible through advancement in technology and human capital development. Emphasis was placed on research and development as core to technological advancement.

**3.0 Methodology**

The study employed ex-post facto research design which relates the response and explanatory variables in order to show cause and effect. Data for the study were sourced from National Bureau of Statistics (NBS), various issues of Central Bank of Nigeria statistical bulletin and World Development Indicator (WDI). The period of data collected covered for thirty three years from 1990 to 2022. The dependent variables for the study were percentage of industrial sector employment and percentage of annual growth rate. The independent variables are liquidity ratio (LR), cash reserve ratio (CRR), exchange rate (EXR), broad money supply (BMS) and monetary policy rate (MPR). The independent variables were used to test each of the dependent variables to ascertain their effects. Philip Perron (PP) and Augmented Dickey-Fuller (ADF) were used as pre-estimation tool to test the stationarity of the data to avoid using a spurious data for analysis. Dickey-Fuller 1979 noted that time series data need to be pre-tested to ascertain if it exhibit randomness that leads to white-noise before being used for estimation. A time series data is said to be white-noise if the variables are independent and identically distributed with mean zero. Autoregressive Distributive Lag (ARDL) was adopted for this study for three reasons. First it uses mixed integrated data, secondly, it is more efficient and offers better results for small set of data and thirdly, the long run results are unbiased (Harris & Sollis, 2003).

**Model Specification:**

Two hypotheses were developed for this study. The first hypothesis tests the effects of monetary policy on industrial sector employment. The second hypothesis tests relationship between monetary policy and industrial sector growth rate. Equations (1) and (2) explain the first hypothesis. Equation (1) shows the functional relationship between the dependent and independent variables while equations (2) shows the econometrics form.

$$INE = f(INF, LR, CRR, EXR, BMS, MPR, TRB) \quad \text{.....(1)}$$

$$INE = a_o + a_1 INF + a_2 LR + a_3 CRR + a_4 EXR + a_5 BMS + a_6 MPR + a_7 TRB + \varepsilon_t \quad \text{.....(2)}$$

$$IDG = f(INF, LR, CRR, EXR, BMS, MPR, TRB) \quad \text{.....(3)}$$

$$IDG = b_o + b_1 INF + b_2 LR + b_3 CRR + b_4 EXR + b_5 BMS + b_6 MPR + b_7 TRB + \varepsilon_t \quad \text{.....(4)}$$

Equations (3) and (4) explain the second hypothesis. Equation (3) shows the functional relationship between the dependent and independent variables while equation (4) shows the econometrics form.

Where INE = industrial sector employment rate, IDG = industrial sector growth rate, LR = liquidity rate, CRR = Cash reserve ratio, EXR = exchange rate, BMS = broad money supply, MPR = monetary policy rate while TRB = treasury bill. In equation (2) and (4) $a_o$ and $b_o$ is the autonomous parameters or the intercepts, $a_1$-$a_7$, $b_1$-$b_7$ are the slope of the explanatory variables while $\varepsilon_t$ is the stochastic term.

## 4.0 DATA ANALYSIS AND INTERPRETATION

**Table 4.1: Descriptive Statistic**

| | IDG | INE | INF | LR | CRR | MPR | BMS | EXR | LOGTRB |
|---|---|---|---|---|---|---|---|---|---|
| Mean | 1.391601 | 11.53151 | 18.08576 | 39.83091 | 14.80606 | 13.74242 | 25.18374 | 146.5512 | 6.785814 |
| Median | 1.761326 | 11.51595 | 12.88000 | 35.00000 | 9.800000 | 13.50000 | 20.67703 | 129.2224 | 7.593601 |
| Maximum | 18.05893 | 12.66120 | 72.84000 | 81.42000 | 75.00000 | 26.00000 | 87.76135 | 425.9792 | 8.450168 |
| Minimum | -8.850374 | 10.14651 | 5.390000 | 25.00000 | 1.000000 | 6.000000 | -0.794167 | 8.038285 | 4.274720 |
| Std. Dev. | 5.630870 | 0.630079 | 16.10830 | 12.97485 | 14.89486 | 3.810699 | 18.55629 | 116.6380 | 1.640520 |
| Skewness | 0.681996 | -0.317892 | 2.199110 | 1.238032 | 2.448276 | 0.746966 | 1.396060 | 0.841832 | -0.566002 |
| Kurtosis | 3.880222 | 2.774430 | 6.826989 | 4.397401 | 9.766398 | 5.117290 | 5.396065 | 2.938160 | 1.512959 |
| Jarque-Bera | 3.623488 | 0.625766 | 46.73650 | 11.11498 | 95.92052 | 9.232779 | 18.61345 | 3.903008 | 4.802498 |
| Probability | 0.163369 | 0.731336 | 0.000000 | 0.003858 | 0.000000 | 0.009888 | 0.000091 | 0.142060 | 0.090605 |
| Sum | 45.92284 | 380.5397 | 596.8300 | 1314.420 | 488.6000 | 453.5000 | 831.0633 | 4836.189 | 223.9319 |
| Sum Sq. Dev. | 1014.614 | 12.70399 | 8303.273 | 5387.093 | 7099.419 | 464.6856 | 11018.75 | 435341.2 | 86.12178 |
| Observ. | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |

**Authors' computation 2024**

From Table 4.1 the mean and median values of all the independent variables lie between the minimum and maximum values. The standard deviations of the response variables are relatively low but positively skewed. The coefficient of Kurtosis indicates that IDG, INF, LR, CRR, MPR and BMS are Leptokurtic since their coefficient is greater than 3 while INE, EXR and LOGTRB are Platykurtic with their coefficients less than 3 respectively. The null hypothesis of the Jarque-Bera statistic is rejected with the exception of INE. The probability of the Jarque-Bera statistic is statistically significant with the exception of IDG, INE, EXR and LOGTRB at either 1% or 5% level of significance.

**Table 4.2: Unit Root Test**

| | @ Level | | @ 1st Different | | |
|---|---|---|---|---|---|
| Variables | ADF stat | PP stat | ADF stat | PP stat | OOI |
| INE | -2.0973 | -1.18887 | -3.2828** | -2.92711** | 1 |
| IDG | -6.0081*** | -5.9660*** | -3.2825** | -27.7628*** | 0 |
| INF | -2.1563 | -2.4293 | -4.3015** | -4.5793*** | 1 |
| LR | -2.5387 | -2.4744 | -7.4915*** | -8.4907*** | 1 |
| CRR | -2.5972 | -2.6777 | -5.7931*** | -8.2898*** | 1 |
| MPR | -3.2388** | -3.1712** | -7.8696*** | -8.3989*** | 0 |
| BMS | -3.1252** | -2.9110 | -5.8749*** | -11.4932*** | 0 |
| EXR | 1.9662 | 2.2029 | -3.9039** | -3.8213** | 1 |
| LTRB | -0.8685 | -0.8865 | -5.4013*** | -5.4011*** | 1 |

*** 1%, **5%

**Authors' computation, 2024**

Table 4.2 shows the unit root test using the Augmented Dickey Fuller (ADF) and Phillips Peron (PP). The results indicate that IDG, MPR and BMS are stationary at levels I(0) while the remaining variables are stationary at first difference I(1). The results are consistent with previous literatures that found most of the monetary policy tools non-mean reverting.

**Table 4.3: Long run Bounds test**

| **F- Bounds Test** | | | **Null Hypothesis No levels relationship** | |
|---|---|---|---|---|
| Test Statistic | | Value | i(0) | i(1) |
| Variables | F-Statistic | Sig | | |
| INE | 2.950212 | 10% | 1.85 | 2.85 |
| IDG | 5.315286 | 5% | 2.11 | 3.15 |
| | | 2.5% | 2.33 | 3.42 |
| | | 1% | 2.62 | 3.77 |

**Authors' computation 2024**

Table 4.3 shows the long run bounds test for IDG with F- statistic value of 5.315286 which is a figure higher than the I(0) and I(1) at both 1% and 5% respectively. The null hypothesis of no co-integration is rejected and we conclude that there is the presence of long run relationship among the variables of IDG. However, the bounds test of INE gives an F-statistic value of 2.950212 which lies between I(0) and I(1) at 1% and 5% levels of significance indicates a weak cointegration. It is concluded that there is somewhat cointegration among the variables of INE and the null hypothesis is rejected.

**Table 4.4 Short Run ARDL Test**

| Variables | Industrial Growth Rate (IDG) | | | | Industrial Employment Rate (INE) | | | |
|---|---|---|---|---|---|---|---|---|
| | Coeff | Std. Error | t-Statistic | Prob. | Coeff | Std. Error | t-Statistic | Prob. |
| IDG(-1), INE(-1) | -0.45793 | 0.426775 | -1.07301 | 0.2949 | 0.703219 | 0.094484 | 7.442731 | 0.0000 |
| CRR | -0.04392 | 0.073066 | -0.60108 | 0.5539 | 0.009975 | 0.003326 | 2.999669 | 0.0066 |
| EXR | -0.04117 | 0.015764 | -2.61152 | 0.0159 | 0.001199 | 0.000702 | 1.708324 | 0.1016 |
| INF | -0.18237 | 0.085768 | -2.12634 | 0.0449 | -0.001962 | 0.003376 | -0.581186 | 0.567 |
| LR | -0.06984 | 0.082498 | -0.84659 | 0.4063 | -0.003025 | 0.004269 | -0.708511 | 0.4861 |
| MPR | 0.398868 | 0.327843 | 1.216645 | 0.2366 | 0.029943 | 0.013094 | 2.286797 | 0.0322 |
| BMS | -0.09886 | 0.054769 | -1.80501 | 0.0848 | -0.002262 | 0.00242 | -0.93447 | 0.3602 |
| LOGTRB | 1.58944 | 1.003014 | 1.584664 | 0.1273 | -0.060408 | 0.053032 | -1.139091 | 0.2669 |
| ECT(-1) | 0.099621 | 0.407403 | 0.244527 | 0.8091 | -0.060539 | 0.044093 | -1.372984 | 0.1836 |
| C | 0.721363 | 7.792551 | 0.092571 | 0.9271 | 3.333152 | 1.116518 | 2.985309 | 0.0068 |

| | IDG | INE | | IDG | INE |
|---|---|---|---|---|---|
| R-squared | 0.351199 | 0.926764 | Mean dependent var | 0.870747 | 11.51994 |
| Adjusted R-squared | 0.08578 | 0.896803 | S.D. dependent var | 4.84646 | 0.636592 |
| S.E. of regression | 4.633936 | 0.2045 | Akaike info criterion | 6.154997 | -0.08619 |
| Sum squared resid | 472.4139 | 0.920048 | Schwarz criterion | 6.613039 | 0.371854 |
| Log likelihood | -88.48 | 11.37901 | Hannan-Quinn criter. | 6.306825 | 0.06564 |
| F-statistic | 1.323187 | 30.93305 | Durbin-Watson stat | 1.909004 | 2.237186 |
| Prob(F-statistic) | 0.281035 | 0.0000 | | | |

**Authors' computation 2024**

From table 4.4 the lag of industrial growth rate is inversely related to the current industrial growth rate and it is not statistically significant at 5%. The coefficient of CRR, EXR, INF, LR and BMS are all negative indicating that these variables are inversely related to the performance of industrial growth rate with EXR and INF being statistically significant. MPR and LOGTRB are positive but not significant. A percentage increase in CRR and EXR declines IDG by 4.39% and 4.12% respectively. On the other hand, a percentage increase in MPR and LOGTRB increases IDG by 39.88% and 158.94% respectively. The R-squared value 0.351199 (35.12%) indicates that 35.12% variations in industrial growth rate is accounted by the independent variables. If other variables of monetary policy instruments are accounted for in the model, 8.58% will be explained by the independent variables which are the value of the adjusted R-squared of 0.08578. The F-statistic (1.323187) and probability (0.281035) give the goodness of fit but not statistically significant at 5%. The F-statistic and p-value given above

indicate that the dependent variable is not statistically affected by the presence of the independent variables. The Durbin-Watson statistic of 1.909004 gives an indication that the alternative hypothesis of the presence of serial correlation is rejected. The error correction term (ECT) with a positive value of 0.099621 gives an indication that there is no presence of adjustment of disequilibrium in the long run. This implies that the variables being studied are in a balanced and stable state over the period of the study.

Also, table 4.4 revealed the short analysis of the regression result. It indicates that the lag of industrial employment as a percentage of total employment in Nigeria economy (INE-1) is positively related to the present industrial employment and it is statistically significant. INF, LR, BMS and LOGTRB are inversely related but they are not statistically significant. CRR, EXR and MPR are positive but only EXR is not statistically significant. The error correction term (ECT) of -0.060539 shows the speed of adjustment in the long run. The R-square value of 92.7% is explained by the variations in the independent variables. The F-statistic value of 30.93 shows the robustness of the analysis and the probability of 0.0000 indicates that it is statistically significant. With a Durbin-Watson statistic of 2.237, the null hypothesis of no serial correlation among the variables in the model is accepted.

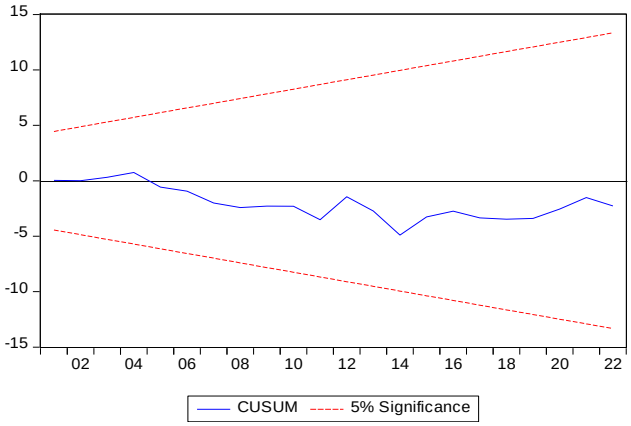


**Figure 2: Stability Test**

Figure 2 shows the stability test of the model where the blue line is enclosed in between the read lines which is 5% critical bound, it indicates that the parameter of the model does not suffer from any structural instability over the period of analysis.

### 4.6 Robustness Test (FMOLS)

| VARIABLES | IDG (COEFF) | IDG (PROB) | INE (COEFF) | INE (PROB) |
|---|---|---|---|---|
| CRR | -0.043919 | 0.5539 | 0.009975 | 0.0066 |
| EXR | -0.041168 | 0.0159 | 0.001199 | 0.1016 |
| INF | -0.182372 | 0.0449 | -0.001962 | 0.5670 |
| LR | -0.069842 | 0.4063 | -0.003025 | 0.4861 |
| MPR | 0.398868 | 0.2366 | 0.029943 | 0.0322 |
| BMS | -0.098858 | 0.0848 | -0.002262 | 0.3602 |
| LOGTRB | 1.589440 | 0.1273 | -0.060408 | 0.2669 |

Table 4.6 shows the robustness of the model using fully modified ordinary least square (FMOLS). With most of the coefficient of the variables in the baseline regression result, conforming with the coefficient of the variables in the fully modified test. It shows the level of robustness of the two regression models, having industrial growth rate (IDG) and industrial employment rate (INE) as separate dependent variables.

## 5.0 CONCLUSION AND POLICY IMPLICATIONS

Monetary policy has proved to be a potent macroeconomic instrument employed to correct or stimulate economic activities and as such cannot be downplayed. Monetary policy has the capacity to improve the performance of the industrial sector which forms the hallmark for this study. This paper studied monetary policy and economic performance in Nigeria focusing on the industrial sector. The period covered by this study was 33 years from 1990 - 2022. The independent variables did not exhibit equal strength on the dependent variables. This study was carried out using descriptive statistic, ARDL and error correction term (ECT). It was observed that the lag of IDG(-1) was negatively related to the current year's growth rate while lag of INE(-1) was positively related to the current year's industrial employment. The independent variables had negative effects on IDG except MPR and LOGTRB while on the IDE only CRR, EXR and MPR were positive. The result of this study is in line with the position of Keynes (1936) that monetary policy improves economic performance and the overall wellbeing of the economy. This study aligns with the findings of Asiagwu, Utalor and Anaele (2021) and Beyene & Singh (2019);

The policy implications from this study are:

i. Monetary authority is advised to reduce the rate of inflation, liquidity ratio and broad money supply. Any increase in these instruments will hamper the growth rate and employment ability of industrial sector.

ii. The present monetary policy rate (MPR) is ideal for the sustenance of the sector given the fact that it has positive effect on both dependent variables. The Central Bank of Nigeria is advised to apply caution in the management of the MPR (being the benchmark for lending rate) during economic fluctuation so as not to hamper the performance of the industrial sector.

iii. The monetary authority should review the impacts of these instruments from time to time to enhance economic performance of the industrial sector.

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