Monetary Policy Shocks and Industrial Output in Nigeria: A Dynamic Effect

Akanbi Michael Olanrewaju[16] and Dada James Temitope[17]

Abstract
The study examines the dynamic effect of positive and negative monetary policy shocks on industrial output in Nigeria. Quarterly secondary data covering the period from 1986 to 2015 were used for the study. Applying Autoregressive Distributed Lag (ARDL), the results shows that both negative monetary policy shocks and positive monetary policy shocks have negative effect on industrial output in Nigeria both in the short run and in the long run. The study recommend that monetary policy should the used with caution in Nigeria.

Keyword: Positive Monetary Policy Shock, Negative Monetary Policy Shock, Industrial Output, ARDL

[16] Department of Economics, Obafemi Awolowo University, Ile-Ife, Nigeria, email: michy_4me@yahoo.com,
[17] Corresponding author, Department of Economics, Obafemi Awolowo University, Ile-Ife, Nigeria, email: temitope2081@yahoo.com

1.0 Introduction

Monetary policy has always been seen as a fundamental instrument over the years for the attainment of macro-economic stability, often viewed as prerequisite to achieving sustainable output growth. The influence of monetary policy on real economic activity has been a contentious area of macro-economic debate. A vast literature (to name a few, Friedman and Schwartz, 1963; Romer and Romer, 1989; Sims, 1972, 1980a, 1980b; Stock and Watson, 1989; Masih and Masih, 1996; Ibrahim, 1998; Tan and Baharumshah, 1999; Ramachadran,2004; Gamber and Hakes,2005) has been devoted over the past few decades to ascertain the importance of money in the economy. In the words of Friedman (1968), "Monetary Policy was a string. You could pull it to stop inflation but you push it to halt recession".

The industrial sector in Nigeria is regarded as the engine of economic growth and the financial sector is widely acknowledged as the lubricant of that engine. Nigerian governments since independence had pursued various policies aimed at revamping the industrial sector. It had aimed at setting the economy on the path of sustainable development. In the words of Mike (2012), industrial policy is a deliberate attempt by government to promote industrialization. However, these policies had not been able to come near to realizing the desired development in the industrial sector. The influence on policy makers by primordial sentiments such as vested interest or rent seeking by external and internal forces, failure to get input from the relevant stakeholders, lack of infrastructural facilities, poor linkage between the sectors, lack of political will on the part of the leaders coupled with corruption, excessive import dependence and inability of government to operationalize the policies were factors that led to the failure of Nigeria industrial policies. Most of them are mere blue prints well staked in shelves but never consulted for implementation. The disappointing performance of the industrial sector in Nigeria is receiving increasing attention of the monetary policy makers. This intervention in industrial sector is wild spread and is practiced in rich and poor countries alike. The story of Nigeria's industrialization level (quality & quantity wise) has been less desired. Most of the countries that were in the same shoes as Nigeria (Malaysia, Indonesia, Thailand and the likes) have left us at the back (lagging) in terms of their level of industrialization and productivity level.

Controversies have been generated on the issue whether or not the effect of monetary policy and output is symmetric or not with respect to direction of policy change and size of policy shocks in the economy. In the words of Hafstein (2011), "the notion of symmetric and asymmetric effects of monetary policy could be viewed as what happens when the monetary authority introduces a policy innovation, for instance, given that the short-term interest rate is the monetary policy tool, then, does a 1% increase in the interest rate which is a contractionary monetary policy have the same effects on the economy as a 1% decrease in the interest rate which is an expansionary monetary policy? If the answer is yes, the effects are symmetric and the monetary authority can use its policy measure in the same manner at any point in time. On the other hand, a negative answer results in asymmetric effects, monetary authorities can effectively manage these effects so as to get the desire results". Many studies in advanced countries have purported that positive and negative monetary policy shocks have asymmetric effects, see Cover (1992), Delong and Summers (1988), and Morgan (1993) supported that positive and negative monetary policy shocks have asymmetric effects. On the other hand, Ravn and Sola (2004) find that positive and negative monetary policy shocks have symmetric effects. Monetary policy sometimes seems to

have large output effects but at other times, seems to have small or no effect. It is generally conceived that when shocks are unexpected, and they surface, such effects are stronger and felt more than when such shocks are expected. This is supported by the studies of Lucas (1973) and, Sargent and Wallace (1975) in the Policy Ineffectiveness Proposition (PIP) hypothesis. In Nigeria, the works of Odedokun (1991), Saibu and Oladeji (2008) and Apanisile (2012) have examined the PIP hypothesis nexus between monetary policy and macro-economic variables with mixed findings. They all came into conclusion that unanticipated monetary policy has effects on output without stating categorically whether it is the positive or negative unanticipated monetary policy shock that has impact on macro-economic variables. Apart from the fact that most studies have focused on monetary policy and economic growth, they have paid less emphasis on positive and negative monetary policy shocks on industrial output. They have not also considered the asymmetric relationship between monetary policy shocks and industrial output in Nigeria. Hence, this study seeks to fill the gap by empirically investigating the relationship between monetary policy shocks and industrial output in Nigeria.

The remainder of this study is organized as follows. While section 2 reviews the literature, section 3 provides the methodology of the study. Section 4 reports the empirial results and discusses the findings. The last section gives conclusion and reccomendations.

2.0 Literature Review

The theoretical foundation of this study provides a number of reasons for asymmetric output response to changes in monetary policy. Generally, these asymmetric effects are explained on the basis of asymmetric information and nominal rigidities. In the theoretical front, four theories were considered and they are the traditional Keynesian asymmetry, menu cost, credit rationing hypothesis and asymmetric information. The Keynesian asymmetry states that positive money supply shocks are neutral while negative money supply shocks have real effects. This asymmetry can be derived under the assumption of either downwards (upwards) sticky (flexible) nominal wages or sticky prices together rationing of demand. This is the type of asymmetry that has been tested empirically for the US by Delong and Summers (1988) and Cover (1972). The Menu Cost model explain the strategy of keeping prices constant in response to a small nominal demand so as to avoid the menu cost.

Akerlof and Yellen (1985), Mankiw (1985) and Blanchard and Kiyotaki (1987) have analyzed how menu-cost models or near-rationality may affect the pricing decision of firms and how this affect changes in nominal demand. The menu cost model concludes that positive money supply shocks are more likely to be neutral than negative money-supply shocks. The reason is that, in the face of the positive steady-state inflation, "moderate" negative shocks bring the actual price closer to the optimal price and oppositely so for positive shocks. The Credit Rationing Hypothesis is another source of asymmetry because monetary policy may affect aggregate output and employment differently in booms and recessions. In booms, credit and liquidity may be readily available and thus likely that monetary shocks are neutral (or close being neutral). In recessions, firms and consumers may find it harder to obtain funds for investments and production.

There are more chances of facing credit constraints during recessionary periods than in expansions. According to credit rationing hypothesis explained by Bernanke and Gertler (1989), a tight monetary policy will increase the cost of capital as well as lessen the liquidity which in turn lead to a contraction of investment demand for the investors who are already facing credit constraints. This is the mechanism looked into in the research of financial market imperfections (Gertler; 1992; Greenwald and Stiglitz;1993). The asymmetric information was extensively discussed by Akerlof G., Spence M., and Stiglitz J. which they jointly received the Nobel Prize in Economics for 2001. Akerlof's contribution is the main focus due to the fact that he is the oldest amongst the three and also made his contribution before others. The key paper in the economic asymmetric information is Akerlof's (1970) study of the market for lemons, one of the most frequently cited papers in the last half of the 20th century. The 'lemons' in question are used cars. Akerlof began by noting the owner of a car knows more about than any potential buyer.

Therefore, the used car market inevitably involves asymmetric information. Akerlof showed that awareness of their relative ignorance would lead potential buyers to assume that any used car would have a high probability of being low quality, a lemon. This would cause them to bid down the price of used cars in general, and this would drive highest quality used cars out of the market. The idea of asymmetric effects of monetary policy is not new. We can find its root in the Great Depression at the end of 1920's when it was realized that an expansionary policy may not work. Before that, the impact of monetary policy was considered to be symmetric and it was believed that by changing monetary policy, Central Bank can lower or stimulate the level of economic activity equally well.

Empirically, the first distinction made in the effects of changes in nominal demand was about the different effects of anticipated and unanticipated changes in monetary policy on output done by Barro (1977), Mishkin (1982), Frydman and Rappoport (1987). However, the notion of asymmetric in the effects of monetary policy actions was actually realized after the seminar work by Cover in 1992 where he concludes that negative money supply shocks have a significantly larger effect on output than positive shocks do. Delong and Summers (1988) echoed Cover's findings which was questioned by Rhee and Rich (1995). Rhee and Rich (1995) found that asymmetric effects of money on real output is largely fuelled by inflation periods. During moderate inflation periods, evidence that support asymmetric effects of money on real output is difficult to come-by.

Empirical evidence from U.S. in Karras's article of 2013 titled "Asymmetric effects of monetary policy with or without Qualitative Easing", this papers asks whether the effects of Qualitative Easing are subject to the asymmetries that have been established for more conventional monetary policies. Using quarterly data from 1950-2011, monetary base shocks and their effects on real GDP and industrial production are estimated. The paper's finding strongly support with or without Qualitative Easing, monetary base contractions have larger effects than monetary base expansions (sign asymmetry) and size asymmetry appears stronger in negative shocks than positive monetary base shocks. Empirical evidence from ASEAN-4 Economies (Indonesia, Malaysia, Philippines and Thailand) in the work of Siow-Hooi *et al* (2010) titled "Asymmetric Effects of Monetary Policy in ASEAN-4 Economies. The paper employed a Markov model to examine if real output asymmetrically responds to monetary policy shocks in these afore-

mentioned countries. The study provides evidence that a contractionary monetary policy has a larger absolute impact than an expansionary policy. Moreover, the effects of an expansionary policy are gradually mitigated when the inflation rate is increasing (except in Malaysia). These findings imply that monetary authorities must consider not only the behavior of the inflation process but also the fact that not all economies can react in a similar way to expansionary and contractionary monetary policy shocks.

The existence of asymmetric in the economies of perspective union partners may limit the influence of monetary policy under any joint currency arrangement. Some economies may face a monetary policy that is determined by union-wide economic conditions but which is not suited to their own conditions. Coming down home, Saibu and Oladeji (2007) investigated the asymmetric effects of monetary and fiscal policies on real output growth in a small open economy (Nigeria) using a modified Generalized Autoregressive Conditional Heteroskedastic (GARCH). Danilo (2008), in his paper titled "Monetary Policy and Asymmetries in the Business Cycle of Argentina", using the data from 1977-2006, studies the asymmetries that are claimed to rise in the real economy as a response to monetary policy shocks. It follows Lo and Piger's (2005) regime-switching specification in order to investigate time variation in the response of transitory component of output to monetary shocks in Argentina. The results suggest time variation in the coefficients that describe the response of output, which can be well explained by a dummy variable indicating the phase of the cycle at the time the policy is applied. However, in contrast with the results for the U.S by Lo and Piger (2005), this paper's findings show that output in Argentina responds mostly to policy actions taken during expansions.

In the work of Nadia and Wasim (2013) titled "Are the effects of Monetary Policy on Output Asymmetric in Pakistan?" The research mainly investigates whether the response of output to monetary policy actions is symmetric or not. Using data from the period of 1977:2 to 2001:1, they test all the three main forms of asymmetries in the impact of monetary policy and also make some hybrid cases to go further in the detail of the tested asymmetries. While mainly following the methodology given by Cover (1992), some necessary variations are applied to the procedure. The finding is in favour of asymmetry in the effects of monetary policy actions on output. The results indicate that monetary policy actions seem ineffective in periods of high growth while having strong effects on output during low growth periods. In this paper, expansionary monetary and fiscal policies generally found to reduce output growth while contractionary policies of both monetary and fiscal had boosted output growth in Nigeria. Shen (2000) complemented the existing inverted L-shaped Aggregate Supply curve with a negative-sloped equilibrium locus during very high inflation regime.

By employing data from Taiwan using a time-varying asymmetric model, Shen's (2000) findings argued that an expansionary monetary policy is expected to have a positive effect, no effect and negative effect during low, medium and high inflation regimes respectively. In the paper of Luiggi (2014) titled "Do Monetary Policy Shocks Generate TAR or STAR Dynamics in Output?", it studies whether the relationship between policy shocks of different size and output is better described by threshold autoregressive (TAR) or smooth transition autoregressive (STAR) dynamics. Using a Bayesian framework, a TAR process and a STAR process are formally compared within an unobserved components model of output, augmented with a monetary policy

variable. The Bayesian model comparison favours the notion that the dynamics are non-linear and better described by a smooth transition between regimes which suggest that aggregation plays a role in the dynamics between monetary policy and output. This evidence is further supported by the sectorial level; when more disaggregated data are employed, the transition between regimes is more abrupt. Erick (2012), in his paper titled "Measuring the Effects of Monetary Policy Using Market Expectations", employs an alternative empirical of monetary policy shocks based on market expectations obtained from media and survey information in Peru. Using Peruvian monthly data for the period 2003-2011 (during which the official rate was used explicitly as the monetary policy instrument), shows that the proposed measure provides a more coherent picture of the effects of monetary policy shocks compared to other traditional approaches. The comparison was made on the basis of the corresponding impulse-response functions. Kumar and Khendrakpan (2013), in his paper titled "Are there Asymmetric Effects of Monetary Policy in India" attempts to analyze the effects of monetary policy in India using quarterly data from 1996-97 Q1 to 2011-12Q4. It finds that an unanticipated hike and an unanticipated cut in policy rate have a symmetric impact of on real GDP growth, but differently impact the components of real aggregate demand. While the impact on real investment is symmetric, it is asymmetric on real private and government consumption. An unanticipated cut in policy rate leads to their increase while an unanticipated policy hike in policy rate has no impact on them. The impact on inflation is also symmetric. An unanticipated policy rate change also has a negative impact on real GDP growth as well as on the components of real aggregate demand, except for real government consumption. This research work intends to single out the monetary policy whose shocks can make or mar the growth of industrial output in Nigeria.

3.0 Methodology and Data

In an attempt to investigate the effects of monetary policy shocks on industrial output in Nigeria which may be symmetric or not, this study has adopted Credit-Rationing Theory. According to credit-rationing explained by Bernanke and Gertler (1989), a tight monetary policy will increase the cost of capital as well as lessen the liquidity which in turn leads to a contractionary of investment demand for the investors who are already facing credit constraints. Firstly, the study specifies the monetary policy reaction function from which we get estimates of the series monetary policy shocks. The monetary policy reaction function is given as:

$$\Delta m_t = \Phi(L)\Delta m_{t-1} + \Theta x_{t-1} + \varepsilon_t \qquad (1)$$

Where Δ is the first-difference operator, m_t is the measure of the monetary policy, $\Phi(L)$ is a lag-polynomial, Θ is a vector of parameters, x_{t-1} is vector of exogenous regressors and ε_t is the residual series which are the shocks. The residual series which are the shocks is decomposed into the industrial output equation which is given as:

$$\varepsilon_t^- \equiv -\,{}^1/_2\,[abs(shock_t) - shock_t] \qquad (2)$$

$$\varepsilon_t^+ \equiv {}^1/_2\,[abs(shock_t) + shock_t] \qquad (3)$$

Equation 2 and 3 above (the negative and positive monetary policy shocks) are generated using the decomposition of Cover (1992). ε_t^+ and ε_t^- are the positive and negative parts of ε_t , from equation 2 and 3. These shocks are defined as:

$$\varepsilon_t^+ \equiv max\ (0, \varepsilon_t) \tag{4}$$

$$\varepsilon_t^- \equiv \min\ (0, \varepsilon_t) \tag{5}$$

ε_t^+ equals the money-supply shocks if the shock is positive, otherwise is zero. The series ε_t^- equals the money-supply if the shock is negative, otherwise is zero.

In order to look at the effect of monetary policy shocks on industrial output, the function is stated as follows:

$$ind_t = f(Z_t, \varepsilon_t^+, \varepsilon_t^-) \tag{6}$$

where ind_t is the measure of industrial output, and Z_t are other explanatory variables that affect industrial output.

In specific function, equation 6 can be written as

$$ind_t = \alpha + \phi Z_t + \lambda \varepsilon_t^+ + \beta \varepsilon_t^- + \mu_t \tag{7}$$

Since Z_t (the explanatory variables) contains money supply (m2) interest rate (INT) and inflation rate (INF), substituting it in equation 7 becomes

$$ind_t = \alpha + \phi m2_t + \chi \,\mathrm{int}_t + \delta \,\mathrm{inf}_t + \lambda \varepsilon_t^+ + \beta \varepsilon_t^- + \mu_t \tag{8}$$

Applying a semi logarithm model and Autoregresive Distributed Lag format (ARDL), equation 8 can be written as

$$\begin{aligned} \Delta lind_t = \alpha &+ \sum_{j=1}^{p} \phi_j \Delta lm2_{t-j} + \sum_{j=1}^{p} \gamma_j \Delta l\,\mathrm{int}_{t-j} + \sum_{j=1}^{p} \chi_j \Delta l\,\mathrm{inf}_{t-j} + \sum_{j=1}^{p} \lambda_j \Delta \varepsilon_{t-j}^+ + \sum_{j=1}^{p} \beta_j \Delta \varepsilon_{t-j}^- + \sum_{j=1}^{p} \varphi_j \Delta lind_{t-j} \\ &+ \eta_1 lm2_{t-1} + \eta_2 l\,\mathrm{int}_{t-1} + \eta_3 l\,\mathrm{inf}_{t-1} + \eta_4 \varepsilon_{t-1}^+ + \eta_5 \varepsilon_{t-1}^- + \eta_6 lind_{t-1} + \mu_t \end{aligned} \tag{9}$$

Where Δ is the change, lind is log of industrial output, lm2 is the log of monetary supply, lint is the log of interest rate, linf is the log inflation, ϕ_j, γ_j, χ_j, λ_j, β_j and φ_j are short run parameters, while η_j are long run parameters.

From equation 9, the error correction model is written as

$$\Delta lind_t = \alpha + \sum_{j=1}^{p} \phi_j \Delta lm2_{t-j} + \sum_{j=1}^{p} \gamma_j \Delta l\,\text{int}_{t-j} \sum_{j=1}^{p} \chi_j \Delta l\,\text{inf}_{t-j} + \sum_{j=1}^{p} \lambda_j \Delta \varepsilon^{+}_{t-j} + \sum_{j=1}^{p} \beta_j \Delta \varepsilon^{-}_{t-j} + \sum_{j=1}^{p} \varphi_j \Delta lind_{t-j} + \eta Ect_{t-1} + \mu_t \quad (10)$$

Where Ect is the error correction term.

In order to account whether the response of industrial output to monetary policy shocks is symmetric or otherwise, this study employs a quarterly data for the period 1986:1 to 2015:4. The variable of interests are broad money supply (M_2), interest rate (int_t), inflation rate ($infl_t$) and industrial output (y_t) that are found in the CBN statistical bulletin.

4.0 Results and Findings

Examination of the properties of time series before analyzing the relationship among variables has become important, owing to the challenges non-stationarity presence in regression analysis. To avoid spurious regression estimates, the unit root test (Table 1) on all the variables were carried-out using Phillips-Perron (PP) test and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test. Using Phillips-Perron test, industrial output, broad money supply and interest rate were stationary at first difference I(1) while inflation rate was stationary at level I(0). Applying KPSS test, industrial output and broad money supply were stationary at first difference 1(1) while interest and inflation rates were stationary at level 1(0).

Table 1 Unit Root Test

	PP			KPSS		
Variables	Level	1st Difference	Status	Level	1st Difference	Status
LIND	-2.1903	-14.0818*	I(1)	1.1821	0.2612*	I(1)
LM2	-0.9912	-12.7934*	I(1)	1.2137	0.1651*	I(1)
LINF	-2.9218**	-	I(0)	0.4134**	-	I(0)
LINT	-2.0760	-9.5788*	I(1)	0.6302*	-	I(0)
	PP Critical values			KPSS Critical values		
1%	-3.490210		1%	0.739000		
5%	-2.887665		5%	0.463000		
10%	-2.580778		10%	0.347000		

Sources: Author's Computation, 2017

*Note: * = 1%, ** = 5% significant level. For the Augmented Dickey-Fuller (ADF) test, the automatic maximum lag length based on Schwarz information criterion is applied while for the Phillips-Peron (PP) test and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test, the automatic maximum lag length based on Newey-West Bandwidth is applied.*

The ARDL Bound Testing/Co-integration test in Table 2 shows that there exists a long run relationship between industrial output and monetary shocks in Nigeria because the calculated F-statistic (4.427) is higher than the critical values of the upper bound at 5% and 10% significant level.

Table 2 ARDL Bound Testing/ Cointegration Estimates

Model		
F- statistic 4.427005		
Critical Values	**Lower Bound**	**Upper Bound**
10%	2.26	3.35
5%	2.62	3.79

Source: Author's computation 2017

In order to achieve the effect of positive and negative monetary policy shocks on industrial output, autoregressive distributed lag is used. For the short run estimates (Table 3), it was discovered that negative monetary policy shocks have a negative and significant effect on industrial output. This suggests that an increase in negative monetary shocks will decrease industrial output by 0.0177%. Furthermore, previous lag values of negative monetary policy shocks have a mixed result but these effects are statistically significant which is similar to the result obtained by Edilean and Marcelo (2007) and Garcia and Schaller (1995). It was also discovered that positive monetary shocks have a negative and significant effect on industrial output. This suggests that an increase in positive monetary shocks will decrease industrial output by 0.011%. Also previous lag values of positive monetary policy shocks show mixed results similar to results obtained by Edilean and Marcelo (2007). The coefficient of the error correction term is negatively signed (-0.51) and statistically significant. This implies that the model corrects its short run disequilibrium by 51% speed of adjustment quarterly in order to return to long run equilibrium.

For the long run estimates (Table 4), positive monetary shocks have a negative and significant effect on industrial output, indicating that a unit increase in positive monetary shocks will decrease by 539.4%. While negative monetary shocks also have a negative relationship and insignificant effect on industrial output, indicating that a unit increase in negative monetary shocks will decrease by 284%. The diagnostic statistics also reveals that the model is well specified (Table 5).

Table 3 Short Run Effect of Positive and Negative Monetary Policy Shocks on Industrial Output, ARDL (2, 3, 0, 1, 2, 3), Dependent Variable: D(LIND)

Variable	Coefficient	Std. error	t-statistic	Prob.
D(LIND(-1))	-0.310848	0.128287	-2.423056	0.0175
D(LIND(-2))	-0.256663	0.106004	-2.421250	0.0176
D(LM2)	1.443773	0.540986	2.668783	0.0091
D(LM2(-1))	1.371572	0.730207	1.878334	0.0637
D(LM2(-2))	-3.902647	0.537724	-7.257709	0.0000
D(LM2(-3))	2.453610	0.357378	6.865591	0.0000
D(LINT)	0.004291	0.035753	0.120012	0.9048
D(LINF)	0.005038	0.022027	0.228726	0.8196
D(LINF(-1))	-0.051981	0.024368	-2.133167	0.0358
D(NEG)	-1.771355	0.652008	-2.716768	0.0080
D(NEG(-1))	-2.034768	0.578992	-3.514328	0.0007
D(NEG(-2))	2.719309	0.567357	4.792940	0.0000
D(POS)	-1.100036	0.544861	-2.018928	0.0466
D(POS(-1))	-1.315924	0.398076	-3.305714	0.0014
D(POS(-2))	1.803294	0.369545	4.879763	0.0000
D(POS(-3))	0.741090	0.162029	4.573822	0.0000
COINTEQ(-1)	-0.510579	0.125432	-4.070556	0.0001

Table 4 Long Run Effect of Positive and Negative Monetary Policy Shocks on Industrial Output

Dependent Variable: LIND

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LM2	0.098953	0.011052	8.953709	0.0000
LINT	0.008404	0.069951	0.120139	0.9047
LINF	-0.008653	0.025379	-0.340936	0.7340
NEG	-2.840072	2.364492	-1.201134	0.2330
POS	-5.394403	2.375633	-2.270723	0.0257
C	8.997046	0.311560	28.877401	0.0000

Source: Author's computation 2017

Note: POS is positive monetary shock (ε_t^+) and NEG is negative monetary policy shock (ε_t^-)

Table 5 ARDL Diagnostic Test

Test	LM	ARCH	RESET	Normality Test
F-statistics	4.432	1.004	1.784	0.031
Prob	(0.056)	(0.325)	(0.214)	(0.984)

Source: Author's computation 2017

5.0 Conclusion and Recommendation

The study examines the dynamic effect of positive and negative monetary policy shocks on industrial output in Nigeria. Quarterly secondary data covering the period from 1986 to 2015 were used for the study. Applying Autoregressive Distributed Lag (ARDL), the results show that negative monetary policy shocks had a negative and statistically significant effect on industrial output in Nigeria in the short run, while in the long run, negative monetary policy shocks had a negative but insignificant effect on industrial output. The result further shows that positive monetary policy had a negative and significant effect on industrial output in the short run, while in the long run positive monetary policy shocks had a negative and significant effect on industrial output. Based on the empirical findings, this study makes the following recommendations. Government through its agents which is the CBN should direct commercial banks to give loans at an affordable and considerable rate so as to make funds or credit available for production activities in the industrial sector which definitely boost industrial output in Nigeria. In spite of the increase in money supply into the economy over the years, the industrial output productivity level in Nigeria has been in a dwindling state, CBN should direct commercial banks to keep certain percentage of their loanable funds that is significant enough to trigger the development of real sectors which the industrial sector is part of. CBN through its monetary policies should put in place policies that can reduce the effects of shocks that can mar the activities of industrial sector in Nigeria.

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