Does Open Market Operations as a Monetary Policy tool have Impact on Price Stability in Nigeria?

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Abstract
Open market operation was introduced as a monetary policy tool in Nigeria in 1993. Since then, it has been extensively used in conjunction with other tools such as reserve requirement, discount window operation, and moral suasion as an instrument of price stability; however, inflation in Nigeria has not reduced to the desired single digit level on a consistent basis. It is against this background that, our paper investigated the impact of OMO as a tool for monetary policy on price stability in Nigeria from 1993-2007. Using OLS regression model, our result reveals that open market operation has positive non-significant impact on consumer price stability as proxied by inflation rate in Nigeria. Our result also reveals that there was a positive correlation between open market operation and consumer price stability of the Central Bank of Nigeria for the period, therefore remains a useful tool, hence our recommendation is that it should be used in conjunction with other relevant ones in the maintenance of price stability in Nigeria.
Keywords: Open Market Operation, Price Stability, Nigeria

1.0   Introduction

Monetary policy refers to a combination of measures designed to regulate the value, supply and cost of money in an economy, in consonance with the expected level of economic activity. It has been argued that the objectives of monetary policy include price stability, maintenance of balance of payments equilibrium, promotion of employment and output growth, and sustainable development and these objectives are necessary for the attainment of internal and external balance, and the promotion of long-run economic growth (Nnanna, 2001). The importance of price stability is derived from the harmful effects of price volatility, which undermine the ability of policy makers to achieve other laudable macroeconomic objectives.

However, the success of monetary policy often depends on the operating economic environment, the institutional framework adopted, and the choice and mix of the instruments used. In Nigeria, the design and implementation of monetary policy is the responsibility of the Central Bank of Nigeria (CBN). The mandates of the CBN as stated in the CBN Act of 1958 as amended include; issuing of legal tender currency, maintaining external reserves to safeguard the international value of the currency, promoting monetary stability and a sound financial system and acting as banker and financial adviser to the Federal Government. All these objectives are aimed towards the maintenance of stable price in the country.

As have been observed over the years, Nigeria's consumer prices are very volatile, and more unpredictable than in other emerging market economies countries due to policy inconsistency of monetary policy regulators and again partly because of the long rule of military regime in the country, which created problems for the conduct of a monetary policy aimed at price stability. In an attempt to maintain price stability in the economy, the Central bank of Nigeria uses several monetary policy instruments such as open market operation, reserve ratio etc. However, Open Market Operation as a monetary policy tool in Nigeria was introduced at the end of June 1993 and is conducted wholly on Nigerian Treasury Bills (NTBs), including repurchase agreements (repos). OMO entails the sale or purchase of eligible bills or securities in the open market by the CBN for the purpose of influencing deposit money, banks' reserve balances, and the level of base money and consequently the overall level of monetary and financial conditions. In this transaction, banks subscribing to the offer, through the discount houses, draw on their reserve balances at the CBN thereby reducing the overall liquidity of the banking system and the banks' ability to create money via credit.

Since, 1993, when OMO was introduced as a monetary policy tool, it has been extensively used in conjunction with other tools as an instrument of price stability. However, inflation in Nigeria has not reduced to the desired consistent single digit. It is against this background that our paper sought to investigate the impact of OMO as a tool for monetary policy in Nigeria. The remainder of the paper is organized as follows: Section two contains the review of related literature; section three; our methodology; section four; our presentation and analysis of data; while we conclude in section five with conclusion and recommendations.

2.0   Review of Related Literature

The opening up of the Nigerian economy since 1986, which included a significant degree of trade liberalization as well as financial deepening, suggests that the domestic demand for money cannot be realistically estimated without considering the impact of monetary policy management. In Nigeria, monetary factors and macro-monetary policy announcements are major determinants of the inflation generating process. With every policy announcement, economic agents form their expectations about prices accordingly. These factors have a significant impact on the maintenance of stable price stability in the economy.

Studies abound in the literature on the effects of monetary policies on inflation target of monetary policy authorities. For example, in a study of money demand and the inflation process in Brazil, Calomiris and Domowitz (1989) have argued that expected inflation is determined simultaneously with equilibrium real balances and real government debt. In addition, Calomiris and Domowitz (1989) found that changes in money do not predict changes in the price level whereas changes in the price level do predict changes in money. In many other developing countries, studies show that one of the dominant predictors of inflation is the growth of money (see, Owoye, 1997).

Although these studies return puzzling results, it is evident from their analysis that there seems to be a consensus about the impacts of monetary policy shocks on output and prices in developed economies as Christiano, et. al. (2002) opine. Interestingly, for a developing economy like Nigeria, the potentials for using monetary policy innovations to engender real economic effects are less clear. The ambiguity may stem from the inherent imperfections in the goods, money and labour markets, and the un-sticky nature of prices. among others. Which in the past, central bankers and academia has tried to clarify, using single-equation, simultaneous-equations and (or) the narrative approach (Balolgun, 2007; Odusola, 2005; Uchendu, 1996; Adamgbe, 2004 and Nnanna, 2001).

Bernanke and Mihov (1998) and Leeper, e.t al. (1996) prefer to make the case for the choice of the monetary instrument used for intervention as the major determinant of the degree of impact. They both submit that the traditional approach of using changes in the money stock to stimulate or depress economic activity is inferior to the use of interest rates. This is because the growth rate of monetary aggregates depends on a variety of non-policy influences.

To date, the implementation of monetary policy in Nigeria has been complicated by a number of factors, including fiscal largesse, lack of operational autonomy of the central bank, insufficient and low-quality statistics, a weak transmission mechanism, and a weak financial system. Thus, announcing and pursuing a long-run target for inflation would be a good monetary policy strategy for Nigeria (Batini and Morsink, 2004). Batini and Morsink, (2004) analysis reveals that neither the stable prices/free float nor the fixed exchange rate solutions are particularly appealing for Nigeria in the long run. However, inflation targeting with a free float still seems to be a superior option on various grounds.

Results also suggest that, if over the past 20 years, the Central Bank of Nigeria (CBN) had been granted independence in setting monetary conditions and had followed a Taylor rule consistent with a single-digit inflation target, monetary conditions might have been less accommodative and, hence, inflation in Nigeria might have been lower and less volatile than what was observed. Mishkin (2000) is of the view that inflation targeting has many advantages as a medium term strategy for monetary policy. For these to accrue, all elements of the full-fledged inflation targeting strategy are necessary. Notably, announcing a specific target for inflation and institutionalizing the commitment to price stability enhance the credibility of the strategy and its objectives. The institutional commitment is also important on two other grounds. Clarida, Gali and Gertler (1997), opine that monetary policy in countries such as France and the United Kingdom was far tighter than would have been the case if monetary policy in these countries was focused on domestic considerations.

3.0   Methodology

The research design adopted for this paper is the *ex-post facto* research design. The adoption of this research design hinges on two reasons Firstly, the study relied on historic data obtained from the Central bank of Nigeria statistical bulletin from 1993 – 2008, as such the event under investigation had already taken place and the researcher does not intend to control or manipulate the independent variables. The inability of the researcher to manipulate these variables is a basic feature of *ex-post facto* research design (Onwumere, 2005). Secondly, as described by Kerlinger (1970), the *ex-post facto* research design, also called causal comparative research, is used when the researcher intends to determine cause-effect relationship between the independent and dependent variables with a view to establishing a causal link between them. Data were sourced from the Central Bank of Nigeria Statistical Bulletin from 1993-2007.

The choice of our model is based on, theoretical perspectives of monetary policy instruments as tools for the maintenance of price stability. The OLS regression was used to test the model. Therefore, hypothesizing that Open market Operation does not have a significant positive impact on consumer price stability in Nigeria, led us to formula the model (1):

$INFR = a + b_1 \, OMOR + b_2 \, GDPGR + \mu$ …………................................. (i)

where:

INFR	=	Inflation rate
OMOR	=	Open Market Operation rate
GDPGR	=	Exchange Rate
a	=	Regression equation intercept
b	=	Regression equation coefficient
μ	=	error term

Explanatory Variables

a)   Independent Variable - Open Market Operation

Open Market Operations are the direct actions taken by a central bank to implement its monetary policy objectives for the size of the national money supply by buying and selling government securities or overnight repo agreements, thereby adjusting bank reserve accounts with the central bank. The process of buying or selling government bonds to banks is a way to stabilize the money supply by either adding or removing money from the banking system. In this research, the growth rate of Open market operations sales is used as proxy for open market operation. It was derived by;

$$((OMO_t - OMO_{t-1})/OMO_{t-1})*100 \dots\dots\dots\dots\dots\dots\dots\dots\dots\text{(ii)}$$

b)   Dependent Variables - Consumer Price Stability

This a condition in which the average price level in the economy does not change or changes very slowly, this is a key part of the macroeconomic goal of stability (the other two are full employment and growth). Price stability is commonly indicated by the inflation rate, calculated as percentage changes in either the Consumer Price Index (CPI) or the GDP price deflator. However, price stability is more generally the absence of large or rapid increases or decreases in the price level. In this research the annual rate of inflation is adopted.

c)   Control Variable - Gross Domestic Product

Gross domestic product (GDP) refers to the market value of all final goods and services produced within a country in a given period. The GDP growth rate which measures how fast the economy is growing, either as a percentage increase or decrease of GDP compared to the previous year is adopted in this research as a control variable. The justification is based on the fact that all monetary policy instrument and frameworks in the long run affect productivity output in the country.

4.0   Presentation and Analysis of Data

4.1   Presentation of Data

The section presents the data used for the analysis**.** They include the values of the value parameters (open market operation percentage change, inflation rate in percentage, growth domestic product at real factor cost and growth domestic product growth rate in percentage) for the period 1993-2007. Below the table (4.1) are acronyms for the

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data variables. The computed values of the parameter from 1993-2007 are time series in nature.

Table 4.1   Presentation of Model Data from 1993-2007

Years	OMOS (N,000)	OMOR (%)	INFR (%)	GDP (N,000)	GDPGR (%)
1993	47,265	100	57.2	688,136.6	100
1994	223,681	373	57	904,004.7	31.37
1995	158,190	-29	72.8	1,934,831	114.03
1996	234,836	48	29.3	2,703,809	39.74
1997	111,534	-53	8.5	2,801,973	3.63
1998	27,447	-75	10	2,721,178	-2.88
1999	80,956	195	6.6	3,313,563	21.77
2000	103,845	28	6.9	4,727,523	42.67
2001	386,941.5	273	18.9	5,374,335	13.68
2002	591,988.3	53	12.9	6,232,244	15.96
2003	794,647.1	26	14	6,061,700	-2.74
2004	1,099,446	38	15	11,411,067	46.88
2005	989,840	10	17.9	15,610,882	36.8
2006	1,808,420	83	8.2	18,564,595	18.92
2007	3,736,300	107	5.4	23,280,713	25.4

**Source:** Central Bank of Nigeria Statistical Bulletin, 2008 Edition
Note:
OMOS   =   Open Market Operations Sales
OMOR   =   Open Market Operations Rates
EXR   =   Exchange Rate
INFR   =   Inflation Rate
GDP   =   Gross Domestic Product
GDPGR =   Gross Domestic Product Growth Rate

From table 4.1,, it could be observed that the proxies are represented in aggregates as well as in percentages. For open market operations sales, the table reveals that the highest sale by the Central Bank of Nigeria was in 2007, where N3, 736,300m debt instrument was sold to deposit money institutions in Nigeria. This was followed by 2006 (N1, 808,420m), 2004 (N1, 099,446m), 2005 (N989, 840m), 2003 (N794, 647.1m) and 2002 (N591, 988.3m) respectively. The lowest open market operation sales was made in 1998 (N27, 447m), 1993 (N47, 265m and 1999 (N80, 956) respectively. On percentage changes in open market operation sales, it was observed that there was a negative 1995 (-29%), 1997 (-53%) and 1998 (-75%) respectively, while the other years revealed a positive percentage change and the highest was observed in 1994 where the change was 373% change when compared to the figure in 1993.

On gross domestic product at real factor, it could be observed that there was a gradual progressive increase in the variable from 1993 to 2007. However the percentage changes as observed from the gross domestic product growth rate indicates that the highest growth in Nigeria's GDP was in 1995 (114.03%), this was followed by 2004 (46.88%). A negative growth rate was observed in 1998 (-2.88%). On inflation rate, the highest was recorded in 1995 where it was 72.8%, followed by 1993 (57.2%). It was single digits in 1997, 1999, 2000, 2006 and 2007. Figure 4.1 depicts a diagrammatical representation of table 4.1.

Figure 4.1 Graphical Presentations of Table 4.1
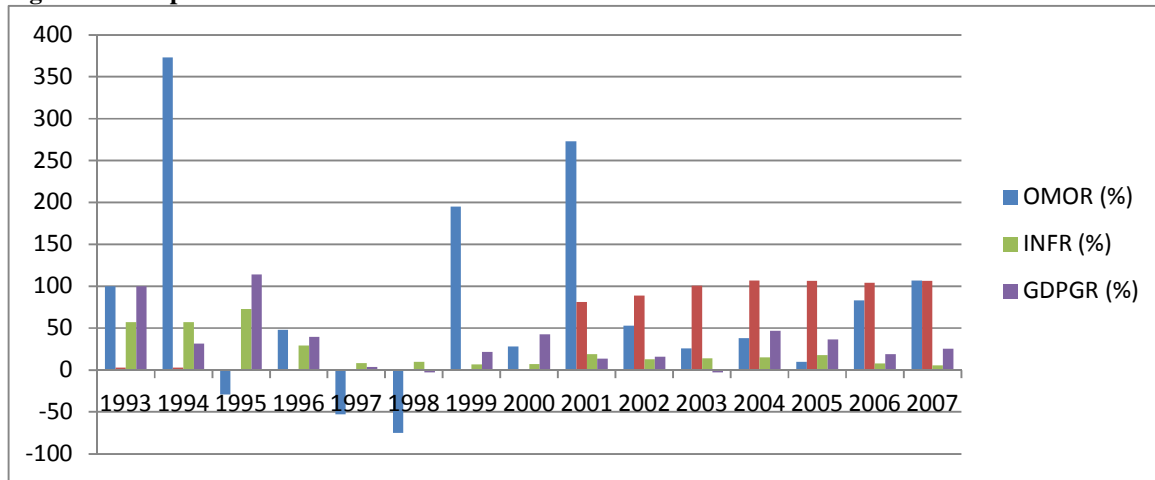
Source: Authors' Graphical Presentation

4.2   Analysis of Results

Table 4.2 below presents the regression and correlation results of our analysis,

Table 4.2   Regression and Correlation Results

Model	R	R^2	R^2 Adj.	Std Error of the Estimate	F Change	t-value	Sig (p)	Beta	Durbin Watson
1	0.828[a]	0.685	0.632	13.1372	13.034	-	-	-	1.298
OMOR	-	-	-	-	-	1.604	0.135	0.260	-
GDPGR	-	-	-	-	-	4.923	0.000	0.799	-

Source: SPSS Results

Model Equation   INFR   = $a + 0.047OMOR + 0.514GDPGR + \mu$

                                $F_{2,14}$ =   13.034, p = 0.001

From table 4.2, it indicates that open market operation has positive non-significant impact on consumer price stability as proxied by inflation rate in Nigeria (t = 1.604, coefficient of OMOR = 0.047). The p-value = 0.135 > 0.05 indicates that it is non-significant. As indicated by the $F_{2,14}$ = 13.034 and p = 0.001, this ANOVA result provides evidence of a strong linear relationship between inflation rate and the two explanatory variables viz open market operation and gross domestic product growth rate. On the correlation results as observed from the table, it indicates that there is a positive relationship between inflation rate and open market operation shown by the beta coefficient of the independent variable (0.260). The coefficient of determination (R^2) result of 68.5% shows that the proportion of the variance in the criterion variable (inflation rate) which is accounted for by our model is significant. This result was further confirmed by the Adjusted R^2 (63.2%). In sum the impact of open market operation in realizing the objectives of price stability has been positive though not significant.

5.0   Conclusion and Recommendations

There is fairly widespread consensus among macroeconomists that the primary long-term objective of monetary policy ought to be a stable currency (Orphanides and Wieland, 1998). The result of our analysis reveals that Open market operation sales as a monetary policy tool have a positive non-significant impact on consumer price stability. That is, an increase in open market sales which involves reducing the volume of currency in the economy reduces the rate of inflation. Conversely a decrease in open market sales through expansionary means of open market purchases increases the rate of inflation in the economy. Again, the paper found that there is positive correlation between open market operation and consumer price stability of the Central Bank of Nigeria for the period.

One of the major objectives of Nigeria's monetary policy is the maintenance of price stability. Using this yardstick, the outcome of monetary policy in Nigeria has been generally mixed. By definition, price stability in Nigeria refers to the achievement of a single- digit inflation rate on an annual basis. Indeed, this objective has not been achieved on a sustained basis (Nnanna, 2001). However a cursory look at the rate of inflation in Nigeria revealed that from 1993

to 2007, a single-digit inflation rate was only achieved in 1997 (8.5), 1999 (6.6), 2000 (6.9), 2006 (8.2) and 2007 (5.4). This is quite worrisome considering the effect such high volatility in price of goods and services will have on outputs in the economy. The effect of such volatility necessitated the introduction of the gross domestic product growth rate as control measure in this paper. We therefore, strongly recommend the use of open market operations among other policy tools as a monetary policy tool in Nigeria. Our result reveals that OMO has had a positive effect in this regard.

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