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IMPACT OF MONETARY POLICY ON THE PRICE LEVEL IN NIGERIA (2001 - 2010)

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Abstract

This paper examines the impact of quantitative monetary policy on the general price level in Nigeria for the period 2001 to 2010. It sought to find out: (i) if quantitative monetary policy measures had any significant impact on the volume of deposit money banks' credits for the period 2001 to 2010; (ii) if deposit money banks' credits had any significant impact on the volume of money supply from 2001 to 2010; and (iii) if money supply had any significant impact on the level of domestic prices from 2001 to 2010. In view of the nature of the study, the causal-comparative research design was adopted. In order for the study to be well guided, three hypotheses were made and tested using the statistical tools of coefficient of determination (R) and the t-statistic. The Central Bank of Nigeria Statistical Bulletin of 2010 supplied the time series data. The empirical results reveal that the liquidity ratio and cash-reserve ratio had a significant impact on deposit money banks' credits injected into the Nigerian economy where as monetary policy rate and treasury bill rate did not for the period considered. Secondly, deposit money banks' credits had a significant impact on money supply from 2001 to 2010. Finally, money supply had a significant impact on the general price level during the period considered in this paper. It is therefore recommended, inter alia, that for monetary policy to have the desired impact on the price level, the instruments of liquidity ratio and cash-reserve ratio should be used more than ever before.

Introduction

Money is the oil that lubricates the wheel of economic growth and development in any society. Without it, exchange of goods and services will be extremely difficult; society will have to resort

to trade by barter, with all its encumbrances. However, for money to be generally accepted as a medium of exchange, its stability of value must not be in doubt over time. In other words, it must be a reliable store of value. It is against this background that the monetary authority of each country seeks to maintain the internal and external balances of its currency through the instrument of monetary policy. The Central Bank of Nigeria (2012) submits that the importance of money in economic life has made policy makers and other relevant stakeholders to accord special recognition to the conduct of monetary policy. Monetary policy rests on the relationship between the rates of interest in an economy, that is, the price at which money can be borrowed, and the total supply of money,. Until the early 20th century, monetary policy was thought by most experts to be of little use in influencing the economy, and for the records, governments of the Western nations after World War ll had to adopt measures that reduced inflation by restricting growth in the money supply due to the inflationary trends conditions of the late 1960s and 1970s, when inflation in the Western world rose toa a level three (Encyclopaedia Britannica Student and Home Edition, 2010). Furthermore, the inlflationary times the 1950 - 1970 average, revived interest in monetary policy (Encyclopaedia Britannica Student and Home Edition, 2010). Edame (2003) explains that monetary policy is a deliberate effort by the monetary authorities to control the money supply and credit conditions for the purpose of achieving certain broad economic objectives. In consonance, the Central Bank of Nigeria (2012) defines monetary policy as a deliberate action nof the monetary authorities to influence the quantity, cost and availability of money and credit in order to achieve desired macroeconomic objectives of internal and external balances. The action is carried out by changing money suppl and/or interest rates with the aim of managing g the quantity of money in the economny. Jhingan (2003) categorises monetary policy instruments nto quantitative and quantative: quantitative monetary measures aim at controlling the cost and quantity of credit by adopting bank rate policy (known as monetary policy rate in Nigeria), open market operations and by variations in reserve ratios of commercial banks. On the other hand, qualitative measures control the use and direction of credit. Monnet (2011) declared that quantitative controls have been the main instruments of monetary policy for decades in Western Europe, Japan and East Asia after World War lI, during the period of highest grOwth ever experienced by these countries. A research carried out by Brunner (1968) on money and monetary policy in the United States of America shows that: (i) monetary impulses are a major factor accounting for variations in output, employment and prices; (ii) movements in money stock are the most reliable measure of the thrust of monetary impulses; and (iii) the behaviour of monetary authorities dominates movements in money stock over the business cycles.

Bernanke and Gertler (1995) submit that one way by which monetary policy takes effect is through the credit market. Mbutor (2009) concords with this submission by pointing out that the credit channel has come to the frontline of discussions of transmission mechanism in recent times. Thus, changes in money supply are expected to affect the lending behaviour of banks, thereby al tering the volume and direction of loan-relatedinvestments in the economy.

Monetary policy can either be expansionary or contractionary, depending on the overall policy thrust of the monetary authorities. It is expansionary when the policy adopted by the central bank increases the supply of money in the system and contractionary, when the actions reduce the quantity of money supply available in the economy or constrains the growth or ability of the deposit money banks to grant further credit. Ina nutshell, the discretionary control of the money stock by the monetary authority involves the expansion or contraction of credit, influencing interest rate to make money cheaper or more expensive depending on the prevailing economic conditions and thrust of policy. Expansionary policy is traditionally used to try to combat unemployment in a recession by lowering interest rates in the hope that easy credit will entice businesses into expanding while contractionary policy is intended to slow inflation in order to avoid the resulting distortions and deterioration of asser values.

In pursuit of the provisions ot the Central Bank of Nigeria (CBN) Ac 2007. the primary

objective of monetary poiicy in Nigeria has remained the maintenance of monetary and price stability (Central Bankof Nigeria, 2012). This gives the citizens confidence in the future value of their money so that they can make sound economic and financial decisions. The CBN added that low and stable inflation also helps to prevent inflationary boom and bust cycles that could result in a recession and higher unemployment. It is in response to this objective that this study sought to find out:

i. the impact of quantitative monetary policy measures on the volume of deposit money banks' credits from 2001 to 2010;

ii. the impact of deposit money banks' credits on the volume of money supply from 2001 to 2010; and

iii. the impact of money supply on the level of domestic prices (as measured by the consumer price index) from 2001 to 2010.

It is important to point out that this study was restricted to those instruments used by the Central Bank of Nigeria to control the volume of credit injected into the Nigerian economy by deposit money banks operating in Nigeria.

Methodology of the Study

For the purpose of this study, the causal-comparative research design was adopted. Furthermore, only the quantitative monetary policy measures were considered for the simple fact that they are amenable to empirical analysis. Three hypotheses were made while secondary data were collected from the Statistical Bulletin of the Central Bank of Nigeria (2010) for the period 2001 to 2010. Statistical tools of analysis applied on the simple linear regression were employed as method of data analysis.

Hypotheses

Null hypothesis I (H. 1): a,=0

Monetary policy rate (MPR), Treasury bill rate (TBR), liquidity ratio (LR) and cash- reserve ratio (CRR) had no significant impact on the volume of deposit money banks credits (DMBC) from 2001 to 2010.

Null hypothesis II (H.2): b, =0

The volune of deposit money banks' credits (DMBC) injected into the Nigerian economy had no significant impact on money supply (MS) for the period 2001 to 2010.

Null hypothesis III (H.3,): c,=0

Money supply (MS) to the Nigerian economy had no significant impact on the general price level - as represented by the consumer price index (CPI) - for the period 2001 to 2010.

Model Specification

Three models have been specified in line with the hypotheses made:

Model 1:

DMBC = a + a1MPR + a2TBR + a3LR + a4CRR + U

Where:

- DMBC = Deposit Money Banks' Credits
- MPR = Monetary Policy Rate
- TBR = Treasury Bill Rate
- LR = Liquidity Ratio
- CRR = Cash-Reserve Ratio
- a = Parameter Estimates
- U = Stochastic or Unexplained Variable

MPR, which replaced the Minimum Rediscount Rate (MRR), is the rate at which deposit money banks borrow from the CBN on a short-term basis. TBR is the principal instrument of open market operations. LR is the ratio of total specified liquid assets to total current liabilities, while CRR is the ratio of cash reserve requirements to total deposit liabilities.

Based on a priori reasoning, the expected signs for the parameter estimates of MPR, TBR, LR, and CRR are:

- ?DMBC/?MPR = a1 ? 0
- ?DMBC/?TBR = a2 ? 0

- ?DMBC/?LR = a3 ? 0
- ?DMBC/?CRR = a4 ? 0

Thus, a1, a2, a3, and a4 are all expected to be negative, indicating an inverse relationship between each of these rates and deposit money banks' credits injected into the Nigerian economy.

Model 2:

MS = b0 + b1DMBC + U

Where:

- MS = Money Supply (broadly defined as M2)
- DMBC = Deposit Money Banks' Credits
- b = Parameter Estimates
- U = Stochastic or Unexplained Variable

Based on a priori reasoning, the expected sign for the parameter estimate of DMBC is:

- ?MS/?DMBC = b1 > 0

Thus, b1 is expected to be positive; the higher the deposit money banks' credits to the Nigerian economy, the higher the money supply, all other things remaining constant.

Model 3:

CPI = c0 + c1MS + U

Where:

- CPI = Consumer Price Index
- MS = Money Supply (broadly defined as M2)
- c = Parameter Estimates
- U = Stochastic or Unexplained Variable

Based on a priori reasoning, the expected sign for the parameter estimate of MS is:

- ?CPI/?MS = c1 > 0

Thus, c1 is expected to be positive, indicating that the higher (or lower) the money supply to the Nigerian economy, the higher (or lower) the consumer price index, signifying a direct relationship between money supply and the consumer price index.

5% level. In order to test the statistical significance of the parameter estimates, the student t- statistic was employed.

Data presentation

The data presented in tables 1, 2 and 3 below are in respect of hypotheses 1, 2 and 3 accordingly.

Table 1: Total deposit money banks' credits to the Nigerian economy, monetary policy rate, treasury bill rate, liquidity ratio and the cash-reserve ratio (2001 to 2010)

Year	Total deposit money banks' credits (DMBC) to the economy (₦ Million)	Monetary policy rate (MPR) (%)	Treasury bill rate (TBR) (%)	Liquidity Ratio (LR) (%)	Cash-Reserve Ratio (CRR) (%)
2001	796,164.8	14.31	12.95	52.9	10.8
2002	954,628.8	19	18.88	52.5	10.6
2003	1,210,033.1	15.75	15.02	50.9	10
2004	1,519,242.7	15	14.21	50.5	8.6
2005	1,976,211.2	13	8.85	50.2	9.7
2006	2,524,297.9	12.25	7	55.7	2.6
2007	7,799,400.1133	8.75	6.91	48.8	2.8
2008	8,602,867,525	9.8125	7.025	41.2	2.3
2009	8,602,867.525	7.4375	4.2	30.7	1.25
2010	8,848,081.675	6.125	4.807	30.425	1

Source: Central Bank of Nigeria Statistical Bulletin (2010)

Table 2: Money supply (broadly defined) and total deposit money banks' credits to the

Nigerian economy (2001 to 2010)

Year	Money supply (M2) (₦ Million)	Total deposit money banks' credits (DMBC) (₦ Million)	Percentage of (DMBC) to Money Supply
2001	796,164.8	796,164.8	12.95
2002	954,628.8	954,628.8	18.88
2003	1,210,033.1	1,210,033.1	15.02
2004	1,519,242.7	1,519,242.7	14.21

2005	1,976,211.2	1,976,211.2	8.85
2006	2,524,297.9	2,524,297.9	7
2007	7,799,400.1133	7,799,400.1133	6.91
2008	8,602,867,525	8,602,867,525	7.025
2009	8,602,867.525	8,602,867.525	4.2
2010	8,848,081.675	8,848,081.675	4.807

Source: Central Bank of Nigeria Statistical Bulletin (2010)

Table 3: Core consumer price index and money supply in Nigeria (2001 to 2010)

Year	Core consumer price index (CPI) ALL items less farm produce (All items composite May 2003 = 100)	Money Supply (M2) (₦ Million)
2001	64.8	1,210,033.1
2002	28.8	1,519,242.7
2003	33.1	1,976,211.2
2004	42.7	2,524,297.9
2005	11.2	7,799,400.1133
2006	97.9	8,602,867,525
2007	13.3	8,602,867.525
2008	52.5	8,848,081.675
2009	71.5	1,210,033.1
2010	81.6	1,519,242.7

Source: Central Bank of Nigeria Statistical Bulletin (2010)

Results

Hypothesis I

The estimate of model1 is:

DMBC (49,062.560)

Core Consumer Price Index (CP): All

items less farm produce (All items

composite = 16,080,000

May 2003 = 100)

Source: Central Bank of Nigeria Statistical Bulletin (2010)

78.4

Decision: R is significant

Hypothesis II

The estimate of model 2 is: MS

Standard error

112.1

129.4

140.8

216,837.697LR - 359,745.387CRR

158.8

Standard error (1,597,604.744) (305,42 1.915)

(136,533.605)

173.4

182.2

199.0

209.4

Decision: R is significant

+ 52,303.983MPR

Comparison: F* > Foos (39.321 > 5.19)

Money supply

(M,)

(NMillion)

543,274.822 + 1.061DMBC

(285,870.767) (0.057)

1,269,321.61

1,505,963.50

1,952,921.19

R?= 96.9%; Empirical F (F*) = 39.321; Theoretical F (Fo os) = 5.19

2,131,818.98

Comparison: F > Fogs (347.295> 5.32)

2,637,912.73

Degrees of freedom = V, and v,; V, = k-1= 5-1= 4 while v, = N-k= l0 - 5 = 3,797,908.98

Where: k= number of parameters (i.e. 5); and N = number of observations (i.e. 10)

The theoretical F (F o0s) was compared with the empirical F (F*) and a decision taken.

5,127,400.70

8,008,203.95

9,411,112.25

11,034,940.93

61,156.575TBR

(172,730.251)

R=97.7%. ; Empirical F (F*) = 347.295; Theoretical F (Foos) = 5.32

Degrees of freedom = v, and v,; Vị = k-l= 2 - 1=1 while v,=N- k= 10

Where: k = number of parameters (i.e. 2); and N= number of observations (1.e. The theoretical F (F oos) Was compared with the empirical F (F*) and a decision taken.

Hypothesis III

The estimate of model 3 is:

CPI Standard error

R= 84.4%6; Empirical F (F*) = 43.271; Theoretical F (Fo 09) = 5.32

Deorees of freedom = V, and v2; Vj =k-l=2-1 = 1 while v, = N -k= 10 -2-

Where: k = number of parameters (1.e. 2); and N = number of observations (i.e. 1o)

The theoretical F (F 005) Was Compared with the empirical F (F*) and a decision taken.

Comparison: F* > Foos (43.271 > 5.32)

Decision: R is significant

Statistical tests of the parameters

Test Statistic

= 92.578 + 0.00001164MS

(10.235)

In order to test the statistical significance of the parameters, the student t statistic was employed.

Hypothesis I

Empirical t (t)

Theoretical

To .o25

Comparison

Decision

Hypothesis II

10.067

(0.00)

+ 2.2621

10.067 >

2.2621

Significant

Test Statistic

t-statistic

Empirical t (t*)

Theoretical to.oz5

Comparison

Decision t-statistic

0.171

2.2621

0.171 ?

2.2621

Not

Parameter Estimates Significant Do

1.900

2.2621

0.354

1.900 ? 2.2621

Not significant

+ 2.2621

-0.354?

Parameter Estimates

-2.2621

Not

significant

-4.420

18.636

+2.2621

+ 2.2621

-4.42 ?

-2.635

18.636 >2.2621

Significant

+ 2.2621

- 2.262 1l -2.2621

-2.635 ?

Significant Significant

Hypothesis III

9.067

(0.00)

+ 2.2621

9.067 >

2.2621

Significant

Test Statistic

t-statistic

Empirical t (t*)

Theoretical to.oz5

Comparison

Decision t-statistic

0.171

2.2621

0.171?

2.2621

Not

Parameter Estimates Significant Do

1.900

2.2621

0.354

1.900 ? 2.2621

Not significant

+ 2.2621

-0.354?

Parameter Estimates

-2.2621

Not

significant

-4.420

18.636

+2.2621

+ 2.2621

-4.42 ?

-2.635

18.636 >2.2621

Significant

+ 2.2621

- 2.262 1l -2.2621

-2.635 ?

Significant Significant

Discussion of Results:

Model 1 Findings:

- The coefficient of determination (R^2) reveals that 96.90% of variations in deposit money banks' credits to the Nigerian economy can be explained by variations in MPR, TBR, LR, and CRR.
- The F-statistic (39.321) indicates that the regression is significant at the 5% level.

- Parameter estimates a2 (TBR) and a4 (CRR) were significant, while a1 (MPR) and a3 (LR) were not.
- Liquidity Ratio (LR) and Cash-Reserve Ratio (CRR) had significant impacts on deposit money banks' credits, whereas MPR and TBR did not.

Model 2 Findings:

- The coefficient of determination (R^2) is 97.7%, indicating that variations in money supply are highly dependent on deposit money banks' credits.
- The F-statistic (347.295) confirms the significance of the regression.
- Parameter estimate b1 (DMBC) was significant, implying that variations in deposit money banks' credits significantly impact Nigeria's money supply.

Model 3 Findings:

- The coefficient of determination (R^2) is 84.4%, suggesting that variations in the general price level (CPI) are significantly influenced by money supply.
- The F-statistic (43.271) confirms that the regression is significant at the 5% level.
- Parameter estimate c1 (MS) was significant, indicating that variations in money supply significantly impact the general price level.

Conclusion:

- Liquidity Ratio (LR) and Cash-Reserve Ratio (CRR) had a significant impact on deposit money banks' credits.
- The Monetary Policy Rate (MPR) and Treasury Bill Rate (TBR) were not effective due to the underdeveloped nature of Nigeria's money market.
- Deposit money banks' credits had a significant impact on money supply.
- Money supply significantly influenced the consumer price index, highlighting its role in determining the general price level in Nigeria.
- To control the general price level, liquidity and cash-reserve ratios should be emphasized while efforts are made to improve the effectiveness of MPR and TBR.

Recommendations:

1. The Nigerian monetary authorities should develop the money market to enhance the effectiveness of monetary policy instruments.
2. The Central Bank of Nigeria (CBN) should encourage deposit money banks to expand their branches to promote savings and reduce cash circulation.
3. Liquidity Ratio and Cash-Reserve Ratio should be prioritized, while efforts are made to make Treasury Bill Rate and Monetary Policy Rate more functional.
4. A combination of monetary policy instruments should be used rather than applying any in isolation.
5. Banks should invest in financial technology to facilitate a cashless society and improve transaction efficiency.

6. Public enlightenment campaigns should be conducted in local languages to educate Nigerians on investment opportunities like Treasury Bills, which can help reduce cash circulation and stabilize prices.

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