The Role of Interest Rates and Liquidity Ratios in Controlling Inflation in Nigeria

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Abstract

This study examined the role interest rates and liquidity ratios plays in controlling inflation in Nigeria. The study adopted interest rate, minimum rediscount rate, liquidity ratio, and cash reserve ratio as the independent variables. These were regressed against inflation rate, the dependent variable. Secondary time series panel data for the period covering 1982 to 2011, were collected from the Central Bank of Nigeria (CBN) Statistical Bulletin in 2011. The study employed multiple regression technique based on E-views 7 computer software to analyze data obtained on the study variables. Four hypotheses were tested and the null hypotheses were accepted based on the regression results. The study found that interest rate, minimum rediscount rate, liquidity ratio and cash reserve ratio had no significant influence on inflation. The study recommended that Nigeria should shift from being a consumption-driven economy to a production-based economy.

Keywords: Monetary policy, Inflation, Minimum rediscount rate, Cash reserve ratio, Liquidity Ratio.

1. Introduction

Inflation was defined as a situation where there is a substantial sustained increase in price of goods and services (Kanu, 2002). Increases in price should be reasonable and also sustained for a long period of time before it could be regarded as inflation. Inflation as it exists in Nigeria is a national scourge which has plagued the economy over the years. It is a phenomenon that has deified all known economic theories. According to Masha (1995), inflation in Nigeria is driven from both demand and supply side. The demand side pressures arise from charges in monetary aggregates while the supply side pressure arises from silent structural characteristics of the economy. Scholars agreed that increases in prices of goods and services, income levels, capital inflow, persistent deficit budgeting, increase money supply among others are some of the causes of inflation in Nigeria.

Traditional monetarist stresses the importance of the link between money supply and inflation and argued that inflation is always and everywhere a monetary phenomenon (Mishkin, 2011). Friedman (1983) opined that inflation has a monetary character because it results from the rise in the quantity of money although, a change in price may not show up at the same time as the rise in the quantity of money. However the monetarist approach is in clear contrast with the structuralist school of thought which sees financial factors as forces propagating inflation rather than causing it. The structuralist point of view is that inflation can result from a number of special problems and not just from excessive money growth. It could also arise from the cost side such as increase in local earning power, as a result of increase in wages and thus drive up production cost and increase the price of goods and services.

As pointed out in 2002 Federal Budget, three types of inflation were identified as the mother of Nigeria's inflationary situation. They are demand-pull inflation, cost push inflation and wage push inflation. Within the Nigeria economy, the effects of inflation includes expansion of production capacity, increase in employment levels, benefits the borrower, high interest rates, low investment, low earnings, high cost of production, depreciation of the nation's currency amongst others.

Monetary policy on the other hand refers to the combination of measures designed to regulate the value, supply and cost of money in an economy in consonance with the expected level of economic activities. According to Uchedu (2009) monetary policies refers to the use of instruments at the disposal of the central Bank to influence availability and cost of credit/money in other to achieve macroeconomic stability. It is a monetary management tool performed by the central bank on behalf of the government. Anyanwu (2003) stated that monetary authorities must attempt to keep the money supply growing at an appropriate rate to ensure sustainable economic growth and maintain internal and external stability. The direction of monetary policy is dictated by the prevailing economic situation and policy objective which have remained broadly the same over the years. Over the years, authorities have enunciated and implemented a myriad of inflationary policies in an attempt to transcend desired economic growth. Till date, the achievement of these remains a subject of public discussion.

The research findings of past studies have not reached consensus on measures of combating inflation, indicating the need to for further studies. Moreover, the economies of the world are different and diverse with

peculiar macroeconomic characteristics. Each must find and adopt their specific measures of dealing with inflation. This paper seeks to examine the role monetary policy plays in curbing persistent presence of inflation and its continuous growth despite effort to reduce it in Nigeria. In more specific terms, the objective of the study was to examine the role of interest rate, minimum rediscount rate, liquidity ratio, and cash reserve ratio in inflation management or control in Nigeria. This form the basis of four the hypotheses tested in the study.

The rest of the paper structured as follows: Section two provides the review of relevant literature, while section three presents the methodology of the study. The results and discussion are presented in section four, and section five dwells on the conclusion and recommendations.

2. Literature Review

This section dwells on the review of related literature to provide a basis for the investigation of the role of monetary policies variables such as interest rate, minimum rediscount rate, liquidity ratio and cash reserve ratio in combating inflation in Nigeria. The review covered theoretical framework and past empirical studies done in Nigeria and countries.

2.1 Theoretical Framework

Inflation has been defined by scholars from countries based on antecedence occurrence on their economies. Okere and Sanni (2005) defined inflation as any general rise in price level which has the tendency of distorting the policy objective of government over a given period of time. It is also defined as a situation of rapid, persistent and unacceptable high rise in the general price level in an economy resulting to general loss of purchasing power (Afolabi & Olayemi, 1995). Essentially, growing inflation affects the value of money by exerting a downward and upward pressure on it. It is an economic phenomenon of consistent raising prices (Okere & Sanni, 2005).

Consequently, the 1950's until the Late 1960's, inflation rates were rare. Following the collapse of the Brenthon Woods fixed exchange rate system in the early 1970's, inflation became a worldwide phenomenon. Since the early 1990's, inflation has however declined. In advanced economics for instance, the median inflation rate has fallen from 7% in the 1980's to 2% in the current decade. In emerging markets, the median inflation rate has fallen from 9% to 4% over the same period. Indeed as seen in the latest issue of the International Monetary Fund's world economic outlook, average inflation in recent years are at their lowest levels since early 1970's. Some of the inflationary theories known are the (a) Cost Push theory (b) Demand Pull Theories (c) Structural Rigidity Theories (d) Open and Suppressed Theory.

2.2 Inflationary Trend in Nigeria

The rising trend in the inflationary rate in Nigeria has become a source of concern to both the Government and members of the public. It is therefore obvious to state that the tide of rising inflation trend can only be controlled if certain policies and actions by both government and public entity authorities are religiously executed (Philip, 1999). Okere and Sanni, (2005) said it has become one of the perennial problems that has plagued the nation especially in the late 80's and 90's. According to him, the trend shows four (4) major episodes of high inflation in excess of 30 percent characterized (especially during the SAP era) by wage increase which created a cost-push effect.

Some of the factors often adduced for this inflation is the drought in the northern part of Nigeria which destroyed agricultural produces and pushed up the cost of agricultural food items, a significant proportion of the average consumers' budget; worsening terms of external trade among others. The experience indicates an excess monetization of oil exports revenue which might have given the inflation a monetary character reaching the peak at 40 percent in 1991. At that time, the government was under pressure to devalue her currency from debtor groups like the IMF. The expectation that devaluation was imminent fuelled inflation as price adjusted to the parallel rate of exchange. Over the same period, excess money growth was about 43 percent and credit to government had increased by over 70 percent (Okere & Sanni, 2005), and (Ogunbiyi & Funsho, 2010).

The third high inflation episode started in the last quarter of 1987 and accelerated through 1988 and 1989. This episode is related to the fiscal expansion that accompanied the 1988 budget. Though, initially, the expansion was financed by credit from the CBN, it was later sustained by increasing oil revenue that was not sterilized. In addition, with the debt conversion exercise, through which debt for equity swaps took place, external debt was repurchased with new local currency obligation. However, with the drastic monetary contraction initiated by the- authorities in the middle of the period, inflation fell reaching its lowest point in 2009.

The fourth inflationary episode occurred in 1983 and persisted through the end of 1997. Though inflation gathered momentum towards the tail end of 1993, it reached 80% by the end of 1997, the highest rate since the 1980s and by the end of 1997, it was above 70%. As with the third inflation period; it coincided with a period of expansionary fiscal deficit and money supply growth. The authorities found it too difficult to contain the growth of the private sector domestic credit and bank liquidity and by the end of 1992, money supply growth

was 70%. The trend continues on a swinging note up to 1999 when Nigeria became a democratic nation and the rate currently stood at 11.1 percent in February 2011 (CBN, 2011).

2.3 Review of Empirical Literature

Gbadebo and Mohammed (2015) examined the effectiveness of monetary policy as a measure to control inflation in Nigeria. Time series data collected for the period 1980 to 2012 were tested using co-integration analysis and error correction model. The study identified interest rate, exchange rate, money supply and oil price as major causes of inflation in Nigeria. They also found that money supply showed significant positive impact on inflation in both the short and long run. Thus they concluded that monetary impulses caused inflation in Nigeria. Emerenini and Eke (2014) investigated the determinants of inflation in Nigeria using OLS technique and co-integration analysis test data collected for the period 2007 to 2014, The econometric model regressed inflation as a function of money supply, treasury bill rate, monetary policy rate and exchange rate. The study found that money supply and exchange rate influenced inflation, while Treasury bill rate and monetary policy rate did not. In a similar study, Raymond (2014) examined the impact of money supply, interest rate, cash reserve ratio, liquidity ratio and exchange rate on inflation in Nigeria. Data covering the period 1980 to 2010 were tested using OLS technique. The study revealed that liquidity ratio and interest rate were effective in combating inflation, while cash reserve ratio, money supply and exchange rate are not. Chuku (2009) also investigated the effect of monetary policy shocks on output and prices in Nigeria, using a Structural Vector Auto-regression (SVAR) model for analyzing data. He found money supply as the most effective monetary policy instrument in combating inflation.

Muco Sanfey and Taci (2004) examined the effectiveness of monetary policy measures in controlling inflation during the transition period in Albania. They concluded that exchange rate was effective in keeping inflation low during the transition period. But the introduction of more monetary policy instruments resulted to more stable and predictable movements in money supply and price levels.

Mishkin (2011) examined the effectiveness of monetary policy strategies for controlling inflation in some developed countries before and after the financial crisis of 2007 – 2009. The study outlined nine basic principles that guided the thinking of most central banks on monetary policy and inflation before the crisis. They also identified five lessons to be drawn from the crisis about monetary policy strategies, and concluded that monetary policy and financial stability policy should be closely linked. Earlier, Mishkin (2000) had examined the evolution of monetary policy in industrialized countries by looking at monetary targeting and inflation targeting. In that study he concluded that monetary targeting worked well for Switzerland and Germany, and suggested that inflation targeting could work well for countries with independent domestic monetary policy.

Kumo (2015) investigated the impact of inflation and monetary policy on economic growth in South Africa, using Generalized Autoregressive Conditional Hetroskedasticity (GARCH) model to test annualized quarterly consumer price data for the period 1960 to 2013. Three monetary policy regimes were identified. The findings revealed that inflation volatility had statistically significant negative impact on economic growth during 1960 to 1998. But inflation volatility had no impact on economic growth during the period 1999 to 2013. The study concluded that South Africa achieved low and stable inflation rates conducive to economic growth from 2000 by adopting an inflation targeting monetary policy regime.

Bhattacharya (2013) investigated the determinants of inflation and the role of monetary policy in combating inflation in Vietnam. He found that exchange rate and bank lending had significant impact on inflation, and there was a strong and significant relationship between inflation and economic growth. He concluded that Vietnam experienced higher degree of inflation than other Asian countries as result of the fact that the state bank had been passive in responding to changes in inflation.

3. Methodology

This section presents the methodology adopted for this study. The study examined the role of interest rate, minimum rediscount rate, liquidity ratio and cash reserve ratio in inflation management in Nigeria. The study adopted *ex-post facto* research design. This is because *ex-post facto* research design is one in which the research does not have the ability to manipulate the data and study variables. Secondary data for the period 1982 to 2011 was collected from the Central Bank of Nigeria Statistical Bulletin 2011. This source of data is considered very reliable and dependable. Availability of relevant required data was a justification for choosing the period 1982 to 2011; which was considered long enough to establish a long-run linearity relationship among the variables.

3.1 Data Analysis

The five main variables identified for the study are inflation rate (INF), used as proxy for inflation management and the dependent variable; while interest rate (INT), minimum rediscount rate (MRR), liquidity ratio (LIQ) and cash reserve ratio (CRR) are used as proxy for monetary policy instruments and the independent variables. Data collected for the study was tested using multiple regression analysis based the computer software E-views 7.

3.2 Model Specification
Here, the researchers prefer to view the primary study elements as interrelated set of variables for the fundamental fact that they are inherent in the financial decisions of the authorities. Consequently, the functional regression model adopted for the study is presented as follows:

$$INF = f\ (INT,\ MRR,\ LIQ,\ CRR)$$

Where: INF   =   Inflationary rate
             INT   =   Interest rates
             MRR   =   Minimum rediscount rate
             LIQ   =   Liquidity ratio
             CRR   =   Credit reserve ratio

For the purpose of estimation, we therefore, re-write model in the form of equation as;

$$INF = \beta_o + \beta_1\,INT + \beta_2\,MRR + \beta_3\,LIQ + \beta_4\,CRR + ei \qquad\qquad \text{equation 1}$$

Where: INF   =   inflationary rate
          β_o =   Constant term
$\beta_1, \beta_2, \beta_3, \beta_4$ = the coefficients of interest rate, minimum rediscount rate, liquidity ratio, and cash reserve ratio to be determined
          ei   =   error or stochastic term.
    $\beta_1, \beta_2, \beta_3, \beta_4 > 0$ = the apriori expectation is positive values

4. Data Presentation, Results and Discussion

The table 1 shows the trend in movement in inflationary rate, interest rate, liquidity ratio and the minimum rediscount rate of the Central Bank of Nigeria. As evidenced from the literature, a cursory look at inflationary rates shows that it reached its peak of 72 percent in 1997 after the much visible fluctuations. The increasing trend continued up to 44.5 percent in 1994, 57.2 in 1995, 57.0 in 1996 and 72.8 in 1997 which could be tagged as the highest ever witnessed by the economy. The logical explanation is evidence in the literature. On the other hand, interest rate maintained a persistent but minor fluctuations increase until it reached its peak at 42 percent in 2010. This may not be unconnected from the recent global financial crises that found its way into the economy. As a matter of controlling money in circulation, the liquidity ratio seems not to have a definite movement pattern. This is evidenced from the fact that its usage is at the mercy of situational circumstances. The cash reserve ratio and the minimum rediscount rate show onward similar movement with liquidity ratio.

Table 1: Annual rates and ratios of the study variables (1982 – 2011)

Year	Inflation Rate %	Interest Rate %	Minimum Rediscount Rate %	Liquidity Ratio	Cash Reserve Ratio
1982	9.9	6.50	6.00	47.6	10.6
1983	20.9	7.75	6.00	38.5	9.5
1984	7.7	9.50	8.00	40.5	10.7
1985	23.2	7.50	8.99	54.7	7.1
1986	39.6	9.75	10.00	65.1	4.7
1987	5.5	10.50	10.00	36.4	1.7
1988	5.4	10.50	10.00	36.4	1.7
1989	10.2	18.05	12.25	46.5	14
1990	38.3	16.50	12.75	45.0	2.1
1991	40.9	26.80	18.50	40.3	2.9
1992	7.5	25.50	18.50	44.3	2.9
1993	13.0	20.4	14.50	38.6	2.9
1994	44.5	29.80	17.50	29.1	4.4
1995	57.2	26.09	26.00	42.2	6.0
1996	57.0	21.00	13.50	48.5	5.7
1997	72.8	20.18	13.50	33.1	5.8
1998	29.3	19.74	13.50	43.1	7.5
1999	8.50	18.29	13.50	40.2	7.8
2000	10.0	21.32	14.31	46.8	8.3
2001	6.6	17.98	18.00	61.9	11.7
2002	6.9	18.29	13.50	64.1	9.8
2003	18.9	20.48	14.31	52.9	10.8
2004	12.9	24.15	19.00	52.9	10.6
2005	14.0	20.50	15.75	50.9	10.0
2006	15.0	19.15	13.00	50.5	8.6
2007	17.9	15.75	10.00	50.2	9.7
2008	8.2	15.75	10.00	57.9	4.2
2009	5.4	18.25	9.50	55.1	5.6
2010	11.6	42.60	9.75	57.6	5.9
2011	11.9.	10.50	9.90	56.2	6.2

Source: CBN Statistical Bulletin 2011

Table 2: Regression Estimation Results (Dependent Variable - Inflation Rate)

Variables	Coefficients	Standard error	t-Statistics	Sig t-values.
INT	-0.062	0.469	-.237	0.8 14
MRR	0.344	0.824	1.280	0.209
CRR	0.075	0.468	0.437	0.665
LIQ	-0.175	0.210	-0.983	0.332
R= 0.387, R^2 = 0.149, Adj R^2 = 0.049, F= 1.493, Sig F= 0.226				

Source: E-view 7 Data Output

Following Maddala (2007) and Norusis (2000), the beta values are adopted for the variables since they are not measured in the same units. The results indicate a positive relationship between cash reserve ratio (CRR), minimum rediscount rate (MRR) and inflation rate (INF) which leaves more to desire in the theoretical sense. In the same vein, the negative relationship observed between interest rate (INT), liquidity ratio (LIQ) and inflation rate (INF) indicate a mutually exclusive characteristics. The results in table 2 above shows that, on the whole, the strength of the combined relationship between all the employed explanatory variables and inflation as indicated by the coefficient of the multiple correlations R is 0.387 i.e. a 38 percent, while the extent to which changes in inflation are explained by changes in the combined variables as portrayed by the values of the coefficient of determination R^2 is as low as 0.149 which is 14 percent.

The combined relationship between the independent and dependent variables as given by the value of the coefficient of regression R is evaluated. The significance of R is verified by means of F-test at 0.05 level of significance as a decision rule, given its degree of freedom. Consequently, the associated result of F-value = 1.493 with corresponding level of significance of 0.226 equivalent to 77 percent confidence level. As a decision rule, since the level of significance of 0.226 and or 77 percent confidence level are below the acceptable 0.05 level of significance, we accept the null hypothesis and reject the alternative that there is a significance relationship between inflation and a combination of interest rate, liquidity rate, cash reserve rate and minimum rediscount rate.

On the other hand, examining the changes in the explanatory variable are relevant in predicting the changes in inflation rate, therefore the beta t-value by means of a t-test at 5 per cent level of significance was considered. The results of E-views 7 gave 0.814, 0.209, 0.665 and 0.332 for interest rate, minimum rediscount rate; liquidity ratio and cash reserve ratio respectively. Being below 5 per cent level of significance, we accept the null hypothesis and reject the alternative that changes in none of the variables are important in predicting changes in the inflationary rate.

5 Conclusion and Recommendations

This study examined the role of monetary policy instruments such as interest rate, minimum rediscount rate, liquidity ratio and cash reserve ratio in combating inflation in Nigeria. Relevant data on the study variables were obtained from CBN Statistical Bulletin and analyzed using multiple regression technique based on E-view 7 computer software. The resultant evidence from this study indicates that;

i.   Inflationary trend and or growth was not significantly related to the combined monetary policy instruments such as interest rate, minimum rediscount rate, liquidity ratio and cash reserve ratio.

ii. That, changes in the monetary policy instruments adopted in the study were also not measures in determining changes in the rate of inflation.

Consequently, what primarily comes to mind is that, what then constitute the persistent rise or increase in the rate of inflation in the country? Evidenced from computation proved that unlike the developed countries where any alteration either or combination of our primary instruments immediately gives the desired shift in macroeconomic balances expected (Onoh, 2007). It is believed that the workings of these explanatory variables are complimented by the fact that the developed economies are producing economies while the emerging ones are consumer economies. This is evident in the Nigerian economy whereby virtually all goods are imported, the essence why the trends persist. Until there is a shift from a consumption economy to a production economy, the trend is unlikely to change. This study therefore recommended that Nigeria should shift her focus from being a consumption based economy to a production based economy for the impact of monetary policies to achieve desired results.

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