

Indirect Monetary Policy Instruments and Poverty Reduction in Nigeria: An Empirical Evidence from Time Series Data

Gideon G. Goshit, PhD and Thaddeaus D. Longduut

Department of Economics, University of Jos, Nigeria.

E-mail: gideongoshit@gmail.com and longduutt@unijos.edu.ng

DOI Link: <http://dx.doi.org/10.6007/IJARBSS/v6-i4/2083>

Published Date: 05 April 2016

Abstract

The paper examines the effectiveness of indirect monetary policy instruments in reducing poverty in Nigeria using a multiple regression model as well as time series data covering the period 1986 to 2012. The Ordinary Least Squares (OLS) technique was used in the estimation of the regression model. The OLS regression result revealed that interest rate (INTR), banking sector's credit to the economy (BSCE), bank reserve requirement (BARR), bank liquidity ratio (BLQR), central bank discount rate (CBDR) and inflation rate (INFR) could not significantly impact on poverty rate except money supply (MS), real gross domestic product (RGDP), unemployment rate (UNEMPR) and balance of payment (BOP). A major implication of this result is that indirect monetary policy instruments alone were grossly inadequate measure/policy to reduce poverty in Nigeria during the period under review. The paper therefore recommends that in addition to combining monetary policy with other economic policies (fiscal, income policies) etc to fight poverty in Nigeria, the monetary authorities as a matter of obligation must strengthen banking rules and regulations to enhance compliance with CBN's rules and directives by commercial banks in order to further facilitate and enhance the effectiveness of monetary policy instruments in the economy in order to influence poverty reduction in Nigeria.

Keywords: Indirect, Monetary policy, Instruments, Poverty reduction, Time series data

JEL Classification: E59, I38, C22.

1. Introduction

The ultimate objective of monetary policy is to promote sound economic performance and high living standards of the citizens. This gives the citizens confidence in the currency as a store of value, unit of account and medium of exchange, so that they can make sound economic and financial decisions. Monetary policy impacts on the wellbeing of individuals depending on the policy measures put in place. For instance, monetary policy affects welfare by influencing the cost and availability of credit. An expansionary monetary policy reduces the cost of credit and thus, boosts investments. This would in turn increase output and

employment and wellbeing (CBN, 2011). The reverse also holds when the monetary authorities seek to pursue a restrictive monetary policy. Therefore, monetary policy is a key element of macroeconomic management and its effectiveness is crucial to the overall economic performance of a country.

Worldwide, there are many objectives that monetary policy tries to achieve in different economies at different times. According to Ajayi and Ojo (2006), four of the quantifiable objectives of monetary policy include high level of employment, price stability, high growth rate and a sustained balance of payment equilibrium. It is the level at which these objectives are attained that gauges the effectiveness of monetary policy in reducing poverty in an economy (Goshit, 2014).

The various instruments of monetary policy which central bank employs to achieve the goals of economic policy could be classified into quantitative or indirect instruments and qualitative or direct instruments. While the indirect approach has been used extensively in more developed economies, the direct approach predominates in the less developed economies such as Nigeria. Both techniques aims at influencing the cost and availability of banking system's credit. They affect level of aggregate demand through the supply, cost of money and availability of credit.

The introduction of SAP in 1986 marked the beginning of the extensive use of the market-based (indirect) instruments of monetary policy in Nigeria. However, the introduction of SAP in the Nigeria economy has made poverty to be arguably the most pressing economic problem of our time because rising inequality in levels of income has led to greater poverty (Goshit, 2014). Yet, the reduction of poverty is the most difficult challenge facing any developing economy including Nigeria where the average of the population is considered poor and evidence in Nigeria shows that the number of those that are poor have continue to increase. Ogwumike (2001) estimated that more than 70 per cent of Nigerians live in poverty. Despite several government's policies and programmes towards poverty reduction in the economy, more than half of Nigeria's population remain poor. The consequences of extreme poverty in Nigeria are manifested in diverse ways including vices such as political thugry, arm robbery, prostitution, hunger, malnutrition, illiteracy, kidnapping, oil bunkering, ethno-religious and political crises etc which are inimical to economic growth and development. At the same time, monetary policy is one of the modern age's most potent tool for managing the economy. Given the devastating effects of poverty on the economy, it is reasonable to ask if monetary policy can be used as a tool to help reduce poverty. It is this possibility that we pursue in this paper. This paper adopts the view that poverty is as a result of insufficient income for securing basic goods and services (basic needs – food, water, shelter, clothing, healthcare, education, etc) as a result of impaired access to productive resources, outcome of insufficient use of resources and as a result of 'exclusion mechanism'.

The major objective of this paper therefore is to examine the impact of indirect monetary policy instruments on poverty reduction in Nigeria. It is also the aim of this paper to determine the nature and direction of causality between poverty rate and indirect monetary policy instruments between 1986 and 2014. The paper is structured into six sections including the introduction as section one. Section two is the literature review. While section three presents the methodology and sources of data, section four is the presentation of the empirical results. Section five discusses the empirical results and implications of the findings. Finally, section six provides the concluding remark and policy recommendation.

2. Literature Review

A concise and universally acceptable definition of poverty is elusive largely because it affects many aspects of human conditions, including physical, moral and psychological. Different criteria have, therefore, been used to conceptualize poverty. Most analyses follow the conventional view of poverty as a result of insufficient income for securing basic goods and services (Ajakaiye and Adeyeye, 2001). Others view poverty, in parts, as a function of education, health, life expectancy, child mortality, etc. Yet, other experts see poverty in very broad terms such as being unable to meet 'basic needs' (physical; food, healthcare, education, shelter, etc and non-physical; participation, identity etc) requirements for a meaningful life (World Bank, 1996). Ajakaiye and Adeyeye (2001) have broadly conceptualized poverty in four ways. These are lack of access to basic needs/goods; a result of lack or impaired access to productive resources; outcome of inefficient use of common resources; result of 'exclusion mechanism'. Poverty as lack of basic needs/goods is essentially economic or consumption oriented. It explains poverty in material terms and specifically employs consumption-based categories to explain the extent and depth of poverty and establish who is and who is not poor. Thus, the poor are conceived as those individuals or households in a particular society, incapable of purchasing a specified basket of basic goods and services. Basic goods are nutrition, shelter/housing, water, healthcare, and access to productive resources including education, working skills, tools, political and civil rights to participate in decisions concerning socio-economic conditions (Adeyeye, 1999). The first three are the basic needs/goods necessary for survival. Impaired access to productive resources (agricultural land, physical capital and financial assets) leads to absolute low income, unemployment, undernourishment etc.

On the other hand, the literatures examining the effects of monetary policy on poverty is relatively small unlike many studies about trends and causes of poverty and inequality. However, studies on the effectiveness of monetary policy in influencing the Nigerian economy have been well documented by many scholars including Ogwuma (1979); Aigbokhan (1989); Ojo (1992); Asogu (1998); Nwaobi (2001); Ajisafe and Folorunsho (2002); Nnanna (2002) and Masha (2002) among others.

It is a well known fact that monetary policy can affect the poor through expansionary monetary policy by raising both output and inflation in the short-run. Fouda (2014) posited that high inflation and macroeconomic volatility can also affect the poor through the distribution of income. He argued that the poor may suffer from inflation through an erosion of its nominal assets, whereas the middle class may benefit from an erosion of its nominal liabilities. Ogwuma (1979) submitted that high inflation may also affect income distribution indirectly by lowering output and employment through a variety of channels, indicating distortion in relative price signals and their effects on allocation efficiency. He further stressed that it can also harm the poor by reducing the real value of wages and transfers.

Romer and Romer (1998) have identified at least five channels through which monetary policy can affect long-run income distribution. First, the redistribution caused by swings in unanticipated inflation directly raise inequality. Second, the reduction in physical capital investment caused by uncertainty and financial markets disruptions raise the average return on capital and depress wages; thus widened the income distribution. Third, offsetting this, inflation may shift the burden of taxation away from labour towards capital. Fourth, the markets cause by inflation and macroeconomic instability reduce not just physical investment, but human capital investment. This thwarts an important mechanism by which inequality can be mitigated.

Finally, inflation and macroeconomic volatility may harm some sectors of the economy disproportionately. For example, they may be particularly harmful to simple manufacturing or export-oriented industries. Depending on the relative position of the workers in these industries, this can either increase or decrease in inequality. This therefore implies that the short and long run effects of monetary policy can influence the poor both positively and negatively.

Goshit (2014) has opined that monetary policy can also influence poverty reduction through the attainment of high level of employment in the economy. When the objective of monetary policy is to achieve high level of employment in an economy, money supply will assume an expansionary dimension. First, an expansion in money supply leads directly to increased expenditure on goods and services and there should then be increased employment to produce the extra goods and services being demanded. This increased employment invariably enhances income and thereby reduce income poverty in the economy. On the other hand, Ajayi and Ojo (2006) opined that the alternative view in the transmission mechanism in which the increased money supply is seen to have led to a fall in interest rates, which in turn increases investment expenditure and thus, increased employment could be more potent in poverty reduction. Therefore, improving the quality and quantity of employment opportunities links economic growth to poverty reduction. Hence, a development strategy that fully employs a country's human resources and raises the returns to labour becomes an effective instrument for reducing poverty. It is on this premise that Romer and Romer (1998) submitted that an alternative monetary policy which focuses on real variables including employment and faster GDP growth is both feasible and necessary if any developing country is to make more rapid progress in reducing poverty and generating sustainable development. It is on this backdrop that Oni (2006) stressed that, to generate employment opportunities in Nigeria, the monetary policy must encourage employment-generating investment, facilitate sustainable economic expansion and maintain macroeconomic stability.

Goshit (2014) has further argued that monetary policy also affects poverty in an economy through the attainment of macroeconomic goal of price stability. The achievement of macroeconomic goal of price stability or low inflation in an economy could be possible through the adoption of restrictive or dear monetary policy in order to lower aggregate consumption and investment by increasing the cost of and availability of bank credit. The central bank might do so by selling government securities in the open market, raising reserve requirements of commercial banks, raising the discount rate, and controlling consumer and business credit in the money market and thereby controls inflationary pressures (Jhinghan, 2004). However, a trade-off of policy exist between full employment and price stability goals of the monetary policy. Therefore, price stability does not only guarantees productive firms the ability to forecast output, prices and profits with some levels of certainty, but also allows the poor to acquire goods and services in the economy at a low rate of prices given their income.

Nzekwu (2006) opined that the nature of the relationship between monetary policy and output is an important policy consideration because rapid growth is crucial for poverty reduction. In short, monetary policy can help in promoting economic growth by helping to maintain price stability and ensuring the full use of economy's total productive resources.

Romer and Romer (1998) have however argued that the impact of monetary policy cannot be considered in isolation from the nature of the country's financial institutions. The financial sector is the primary conduit through which monetary policy affects real economic outcomes and monetary policy determines the amount and distribution of resources available

to financial institutions. The adoption of tight monetary policies that emphasize high interest rates and restrict credit flows, with the view to combating inflation are found to be disincentive to investment, private sector development, and employment generation which may further deepen poverty incidence (Goshit, 2014).

Stressing the importance of monetary policy's effects on poverty reduction, Galbraith (2007) also suggested that labour earnings are the primary source of income for most households and these earnings may respond differently for high-income and low income households to monetary policy shocks. This could occur, for example, if unemployment disproportionately falls upon low income groups.

Romer and Romer (1998) made empirical attempts to analyze the effects of monetary policy on poverty and inequality. They analyzed short-term influence of monetary policy on poverty and inequality using the U.S. time series data and found that the short-run and long-run relationships go in opposite directions. Their result indicated a cyclical boom created by expansionary monetary policy was associated with improved conditions for the poor in the short run and low inflation and stable aggregate demand growth was associated with improved wellbeing of the poor in the long run. More recently, Kang, Chung and Sohn (2013) using provincial data for South Korea found that real interest rate and poverty were positively correlated, while real interest rates did not have significant effects on income distribution. They also found that inflation reduces poverty while inflation improves income distribution in the short-term but had no significant effects on income distribution in the long-term. Monetary policy therefore affects poverty and income inequality through income and output growth, employment level, interest rate and inflation. However, none of these works have investigated the impact of indirect monetary policy instruments on poverty reduction in Nigeria. Thus, this paper aims at filling this gap.

Methodology and Sources of Data

The period of this study spans from 1986 to 2012 and the data employed were secondary data sourced from the Central Bank Nigeria (CBN's) Statistical Bulletin and annual report and National Bureau of statistics (NBS). The methodology adopted for this study is the ordinary least squares (OLS).

3.1 Model Specification, Estimation and Evaluation

The role of monetary policy in ensuring sustainable macroeconomic stability, output growth, high level of employment and a favourable balance of payments position is critical to economic growth and development of a country. In the Keynesian analysis, monetary policy affects the level of economic activity through the interest rate and credit conditions. In the quantity theory analysis, it is the changes in the quantity of money that influence the level of economic activity (Ajayi and Ojo, 2006).

According to Ajayi and Ojo (2006), balance of payments influences the money supply, while variation in the money supply determines the level and variation in the GDP and prices. The latter in turn influences or determines the GDP. The rate of growth of the national product also affects the price level. The rate of growth of the price level affects the growth in the money supply.

However, the monetarists (Monetarist theory) belief that "money matters" and for economic stabilization, monetary policy is a powerful tool in an economy. The argument of the monetarist becomes important in this study because monetarism believes that monetary

policy is assumed to have more influence on aggregate expenditure, output, employment and income and hence poverty reduction. Therefore, the model for this study is guided by the monetarist's view on the effectiveness of monetary policy in economic activities and draws from Anderson and Jordan (1968) and Ajayi (1974). The function is therefore specified as; poverty rate is a function of indirect monetary policy instruments such as money supply (MS), interest rate (INTR), banking sector credit to the economy (BSCE), Bank reserve requirement (BARR) bank liquidity ratio (BLQR) and Central Bank Discount Rate (CBDR).

This can be functionally written as:

$$PVR = f (MS, INTR, BSCE, BARR, BLQR, CBDR) \dots\dots\dots(1)$$

However, we also know that output growth (GDP), price levels (inflation rate), unemployment rate and balance of payments are major macroeconomic variables that influence poverty rate in an economy. Introducing these variables in our model yields:

$$PVR = f (MS, INTR, BSCE, BARR, BLQR, CBDR, RGDP, INFR, UNEMPR, BOP)\dots\dots\dots (2)$$

This function could be written in an econometric form as:

$$\log PVR = \log \beta_0 + \log \beta_1 MS + \log \beta_2 INTR + \log \beta_3 BSCE + \log \beta_4 BARR + \log \beta_5 BLQR + \log \beta_6 CBDR + \log \beta_7 RGDP + \log \beta_8 INFR + \log \beta_9 UNEMPR + \log \beta_{10} BOP + \mu \dots\dots\dots(3)$$

Where

PVR = Poverty rate (Annual rate of poverty in percentage)

MS = Money Supply (M₂ or M₁ plus savings deposits)

INTR = Interest Rate (Prime lending rate)

BSCE = Banking Sectors Credit to the Economy

CBDR = Central Bank Discount Rate

BLQR = Bank Liquidity Ratio

BARR = Bank Reserve Requirement

RGDP = Real Gross Domestic Product (Domestic output)

INFR = Inflation Rate

UNEMPR = Unemployment rate

BOP = Balance of Payments

Therefore the apriori expectation of the model is that $\beta_2, \beta_4, \beta_5, \beta_8$ and $\beta_9 > 0$, while $\beta_1, \beta_3, \beta_6, \beta_7$, and $\beta_{10} < 0$. This means that interest rates (INTR), bank reserve requirement (BARR), bank liquidity ratio (BLQR), inflation rate (INFR) and unemployment rate (UNEMPR) are positively related to poverty rate (PVR) while money supply (MS), banking sector's credit to the economy (BSCE), Central Bank discount rate (CBDR), real gross domestic product (RGDP), and balance of payments (BOP) are inversely related to poverty rate (PVR). By implication, increases in INTR, BARR, BLQR, INFR and UNEMPR leads to increase in PVR while increases in MS, BSCE, CBDR, RGDP, and BOP leads to reduction in PVR.

Table 1:
Summary of Theoretical Expectations

| VARIABLE | EXPECTED SIGN |
|----------|---------------|
| MS | Negative |
| INTR | Positive |
| BSCE | Negative |
| CBDR | Negative |
| BLQR | Positive |
| BARR | Positive |

| | |
|---------------|----------|
| RGDP | Negative |
| INFR | Positive |
| UNEMPR | Positive |
| BOP | Negative |

Source: Authors' Computation

3.2 Causality Model

Causality test is carried out between the dependent and independent variables using

Granger causality model to determine the nature and direction of causality between the variables. The granger causality equation for real GDP (RGDP), inflation rate (INFR) unemployment rate (UNEMPR) and balance of payments (BOP) granger cause poverty (PVR) is specified respectively as:

$$PVR_t = \beta_0 + \sum_{i=1}^n \beta_i INTR_{t-i} + \sum_{j=1}^n \beta_j PVR_{t-i} + u_{1t} \dots \dots \dots (4)$$

$$PVR_t = \beta_0 + \sum_{i=1}^n \beta_i RGDP_{i-1} + \sum_{j=1}^n \beta_j PVR_{t-i} + u_{2t} \dots \dots \dots (5)$$

$$PVR_t = \beta_0 + \sum_{i=1}^n \beta_i INFR_{t-i} + \sum_{j=1}^n \beta_j PVR_{t-i} + u_{3t} \dots \dots \dots (6)$$

$$PVR_t = \beta_0 + \sum_{i=1}^n \beta_i UNEMPR_{i-1} + \sum_{j=1}^n \beta_j PVR_{t-i} + u_{4t} \dots \dots \dots (7)$$

The F-statistic is used for the joint test of hypotheses that $\beta_1 = \beta_2 \dots = \beta_n$ in equations 4 to 7.

4. Empirical Results

The empirical investigation commenced with the examination of the time series properties of all the variables. Accordingly, the unit root test was conducted to examine the order of integration of each of the variables in the model. This was followed by the cointegration test to determine the long-run relationship between poverty rate and indirect monetary policy instruments. The causality test between poverty rate and indirect monetary policy instruments using the Pairwise granger causality test was also carried out. Consequently, the Breusch - Pagan - Godfrey (BPG) test was carried out to determine the presence of Heteroscedasticity. Furthermore, the estimation of the model was conducted using the econometric computer software package (Eviews 7.0). The empirical results are presented as follows:

4.1 Unit Root Test Result

The Augmented Dickey-fuller (ADF) test was employed to check the presence of unit root in the series. The result of the unit root test based on ADF is presented in table 2.

Table 2:

Unit root Test Result (Augmented Dickey-Fuller)

| SERIES | ADF STATISTIC | 5% CRITICAL VALUE | PROB* | ORDER OF INTEGRATION |
|--------|---------------|-------------------|--------|----------------------|
| PVR | -4.617802 | -2.986225 | 0.0012 | I(1) |
| MS | -4.438422 | -3.029970 | 1.0000 | I(1) |
| INTR | -4.601828 | -2.981038 | 0.0012 | I(0) |
| BSCE | -4.585171 | -3.020686 | 1.0000 | I(0) |

| | | | | |
|---------------|-----------|-----------|--------|------|
| BARR | -2.70510 | -0048612 | 0.0891 | I(0) |
| BLQR | -5.621599 | 2.986225 | 0.0001 | I(1) |
| CBDR | -2.952757 | -2.981038 | 0.0530 | I(0) |
| RGDP | -6.781600 | -2.991878 | 0.0000 | I(2) |
| INFR | -4.249309 | -2.991878 | 0.0031 | I(1) |
| UNEMPR | -5.846025 | -2.991878 | 0.0001 | I(1) |
| BOP | -4.674650 | -3.012363 | 0.0014 | I(1) |

Source: Authors' Computation using E-Views Version 7.0

Table 2 shows that INTR, BSCE, BARR and CBDR were stationary at levels, that is I(0) variables; PVR, MS, BLQR, INFR, UNEMPR, BOP and RGDP exhibited unit root and were only stationary at either first difference or second difference, hence I(d). To investigate if there is a long-run relationship between the variables, we embark on cointegration test. By implication we want to find out whether the variables will converge in the long-run, if they diverge in the short-run. Thus, cointegration arises base on the need to integrate short-run dynamics with long-run equilibrium between economic variables. This is necessary because in an attempt to achieve stationarity when differencing will result in the loss of valuable information about the long-run equilibrium relationship between the variables.

4.2 Cointegration Test Result

The cointegration test was carried out to determine the long-run relationship between the poverty rate and indirect monetary policy instruments. The Johansen cointegration model was used to carry out the test. The Johansen cointegration test result is presented in table 3.

Table 3:
Johansen Co integration Test Result

| Hypothesized No. of CE(s) | Eigenvalue | Trace statistic | 0.05 value | Critical | Prob** |
|---------------------------|------------|-----------------|------------|----------|--------|
| None * | 0.915089 | 182.5296 | 125.6154 | | 0.0000 |
| At most 1 * | 0.797170 | 120.8760 | 95.75366 | | 0.0003 |
| At most 2 * | 0.696296 | 80.99131 | 69.81889 | | 0.0049 |
| At most 3 * | 0.636894 | 51.19874 | 47.85613 | | 0.0235 |
| At most 4 | 0.405927 | 25.87221 | 29.79707 | | 0.1326 |
| At most 5 | 0.334274 | 12.85338 | 15.49471 | | 0.1203 |
| At most 6 | 0.101706 | 2.681452 | 3.841466 | | 0.1015 |

Trace test indicates 4 cointegrating equations at 0.05 levels

*Denotes rejection of the hypothesis at 0.05 level

**MacKinnon –Haug-Michelis (1999) p-values

The variables included in the co-integration test were the indirect monetary policy variables (MS, INTR, BSCE, BARR, BLQR and CBDR). The co integration test result revealed that there exist four co integrating equations at 5 per cent level.

4.3 Causality Test Result

The Pairwise granger causality test was conducted to find out the causal relationship between poverty rate and indirect monetary instruments. The result is presented in table 4.

Table 4:
Pairwise Granger Causality Test Result

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|--|-----|-------------|--------|
| INTR does not Granger Cause PVR | 25 | 1.71020 | 0.2062 |
| PVR does not Granger Cause INTR | | 2.71673 | 0.0904 |
| RGDP does not Granger Cause PVR | 25 | 1.28257 | 0.2992 |
| PVR does not Granger Cause RGDP | | 1.14035 | 0.0339 |
| INFR does not Granger Cause PVR | 24 | 0.69641 | 0.5107 |
| PVR does not Granger Cause INFR | | 3.30927 | 0.0585 |
| UNEMPR does not Granger Cause PVR | 24 | 0.50410 | 0.6119 |
| PVR does not Granger Cause UNEMPR | | 6.873886 | 0.0057 |

Source: Authors' Computation using E-Views Version 7.0

Note: Rejecting the null hypothesis means that one variable actually granger causes the other, while accepting the null hypothesis confirms that there is no causality between both variables at 5% significance level.

Table 4 shows that there is unidirectional causal relationship between PVR and INTR; PVR and RGDP; PVR and INFR and PVR and UNEMPR. The summary of the nature and direction of the causal relationship between these variable is presented in table 5.

Table 5:
Summary of Causality

| Direction of causality | Nature of causality | Expectation |
|------------------------|---------------------|--------------|
| PVR → INTR | Unidirectional | Not expected |
| PVR → RGDP | Unidirectional | Expected |
| PVR → INFR | Unidirectional | Not expected |
| PVR → UNEMPR | Unidirectional | Expected |
| BSCE → PVR | Unidirectional | Expected |

Source: Authors' Computation

4.4 Breusch – Pagan – Godfrey (BPG) Test Result

The Breusch – Pagan – Godfrey (BPG) was conducted to determine the presence of Heteroscedasticity. The result is presented in table 6.

Table 6:
Heteroscedasticity Test Result

| | | | |
|----------------------------|-----------------|------------------------|---------------|
| F-statistic | 0.236126 | Prob. F(10, 15) | 0.9869 |
| Obs* R-squared | 3.536188 | Prob. Chi-Square (10) | 0.9659 |
| Scaled explained SS | 1.027091 | Prob. Chi-Square (10) | 0.9998 |

Source: Authors' Computation using E-Views Version 7.0

Using the Breusch – Pagan – Godfrey (BPG) test for the presence of Heteroscedasticity, the result confirmed that the explanatory variables were homoscedastic as shown by F-statistic to be 24 per cent with a probability statistic of 99 per cent. This means that the variables were free of Heteroscedasticity, therefore, we can apply the variances of the coefficients to conduct tests of significance and construct confidence intervals in our study.

4.5 The OLS Regression Result of the Model

The regression result revealed that all the variables (MS, BSCE, RGOD, INTR, BARR, and UNEMPR) included in the model possessed their expected signs, except BLQR. The result is presented in table 7.

Table 7:
Ordinary Least squares (OLS) Regression Results

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|--------|
| C | 8.995048 | 3.135569 | 2.868713 | 0.0117 |
| LOG(MS) | -0.198774 | 0.081751 | -2.431445 | 0.0280 |
| INTR | 0.005050 | 0.006250 | 0.808011 | 0.4317 |
| LOG (BSCE) | -0.012738 | 0.069497 | -0.183287 | 0.8570 |
| LOG(BARR) | 0.002915 | 0.058477 | 0.049845 | 0.9609 |
| LOG(BLQR) | 0.035633 | 0.157549 | 0.226168 | 0.8241 |
| LOG(CBDR) | -0.048362 | 0.123622 | -0.391211 | 0.7011 |
| LOG(RGDP) | -0.569821 | 0.297781 | -1.913561 | 0.0750 |
| LOG(INFR) | 0.055790 | 0.036571 | 1.525542 | 0.1479 |
| LOG(UNEMPR) | 0.108733 | 0.042040 | 2.586431 | 0.0206 |
| BOP | -3.60E-08 | 2.56E-08 | 1.408479 | 0.0794 |
| R-squared | 0.868434 | Akaike info criterion | -1.636273 | |
| Adjusted R-squared | 0.780723 | Schwartz criterion | -1.104002 | |
| F-statistic | 9.901119 | Hannan-Quinn cri. | -1.482998 | |
| Prob(F-statistic) | 0.000061 | Durbin-Watson stat. | 1.874705 | |

Source: Authors' computation using E-Views Version 7.0

4.6 Stability Diagnostic

The stability test was performed using cumulative sum (CUSUM) of residuals. The plots of the stability test are given in figure 1. The existence of parameter instability is established if the cumulative sum of the residual goes outside the area between the critical (dotted bounded) lines. It was estimated at 5 per cent critical level.

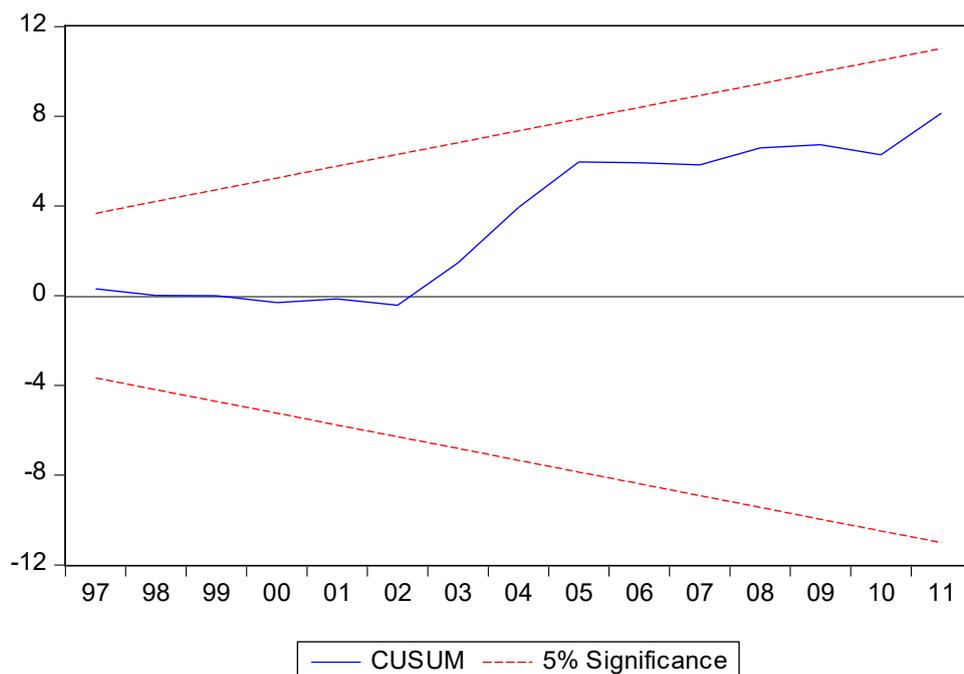


Figure 1: Stability Test Result

From figure 1, it can be inferred that the model at 5 percent level of significance has been stable over time and can be relied upon for forecast. This is because the observed bound is lying between the two limits and it is positive overtime at 5 percent critical value.

5. Discussion of Empirical Results and Implications of Findings

The empirical investigation commenced with the examination of the time series properties of the data employed. The unit root test result shows that INTR, BSCE, BARR and CBDR were stationary at levels while the rest of variables exhibited unit root and were only stationary at either first or second difference, hence $I(d)$. It therefore means that there is a long-run relationship that exists between poverty rate and indirect monetary instruments in the model.

The granger causality test result on its part shows that causality only exists between PVR and INTR, RGDP, INFR, UNEMPR and BSCE in the model. The nature and direction of causality between PVR and INTR, RGDP, INFR and UNEMPR was unidirectional and it runs from PVR to INTR, RGDP, INFR and UNEMPR. However, it was a unidirectional relationship between PVR and BSCE running from BSCE to PVR. This means that poverty rate causes interest rate, real gross domestic product, inflation and unemployment rates during the period without feedback. The implication of this result is that out of the variables under consideration in the model, only interest rate, real gross domestic product, inflation rate, unemployment rate and the banking sector's credit to the economy contain useful information for predicting poverty reduction in the economy.

The OLS regression result indicated that the a priori expectations of all the variables were met with respect to their signs except BLQR. However, it was only MS, RGDP, UNEMPR and BOP that were statistically significant at 5 percent level. This implies that only MS, RGDP, UNEMPR and BOP in the model were capable of influencing poverty rate significantly during the period. The result further revealed that a unit increase in MMS, BSCE, CBDR, RGDP and BOP led to 19 percent, 1 percent, 4 percent, 56 percent and 36 percent reduction in poverty rate respectively. While a unit increase in UNEMPR led to 10 percent increase in poverty rate. However, it is interesting to note that only MS, RGDP, BOP and UNEMPR among these

variables were statistically significant at 5 percent level. This implies that the major determinants of poverty rate in the model were MS, RGDP, BOP and UNEMPR. Although INTR, BARR and INFR attained their a priori expectations, they were not statistically significant. By implication, they were not major determinants of poverty rate within the model.

On the other hand, BLQR was found to be positively related to poverty rate in the model. This actually violates the theoretical expectation of the model. However, it was not statistically significant, therefore can not be considered as a major determinant of poverty rate in the model. The negative sign of RGDP implies that there is an inverse relationship between RGDP and PVR. This confirms the theoretical expectation of the model which specifies that increase in RGDP would enhance employment which would further lead to increases in income hence reduction in poverty rate. The negative relationship between MS, BSCE, CBDR, and BOP also confirms the expectations of the model that increases in these variables would lead to reduction in poverty rate in the economy as formulated.

The goodness of fit ($R^2 = 0.868434$) of the model was impressive signifying that 86 percent variation in poverty rate was explained by variation in the independent variables. The result also revealed that the overall performance of the specified model was jointly statistically significant at 5 percent level given a low value of the probability of F- statistic = 0.000061 which is less than the F- statistic = 9.901119. This means that the independent variables jointly impacted significantly on poverty rate during the period under study. However, we should note that indirect monetary policy instruments (MS, INTR, BSCE, BARR, BLQR, and CBDR) included in the model did not on their individual capacity influence poverty rate. That is, they were individually statistically insignificant in influencing PVR. This point to the fact that the indirect monetary instruments in Nigeria are not well developed and there is also a fundamental problem with the conduct of monetary policy in the economy. This can also be adduced to the fact that the monetary institutions (the banking sector) is yet to be fully developed to properly gain control over the indirect monetary instruments in the economy.

Furthermore, the low values of the Akaike information criterion – AIC = -1.636273; Schwartz Bayesian Criterion – SBC = -1.104002; and Hannan – Quinn criterion – HQC = -1.482998 implies that the model was adequately specified. The result also demonstrated by the Durbin Watson statistic = -1.874705 the absence of auto correlation. That is, the data employed was free of serial correlation.

6. Conclusion and Policy Recommendation

This paper attempted to fill some gaps in the knowledge of monetary policy and poverty reduction by examining the impact of indirect monetary instruments on poverty reduction in Nigeria. The empirical findings of this study revealed that MS, RGDP, BOP and UNEMPR had significant impact on poverty rate in Nigeria during the period under study. Therefore statistical evidence strongly suggests that indirect monetary instruments, in spite of the ineffectiveness of some of the indirect monetary instruments (INTR, BSCE, BARR, BLQR, CBDR and INFR) have produced some impact on poverty rate in Nigeria. It was evident from the result that out of the monetary policy variables (indirect instruments), it was only money supply that had significant impact on poverty rate. This suggests two major implications on the development of the Nigerian economy. First, this implies that the monetary policy has not been efficiently conducted to impact significantly on the real sectors of the economy to be able to reduce poverty rate in the economy; and/or the monetary institutions and instruments are not well developed to influence the real sector to further influence poverty

rate in the economy. Secondly, it can also be deduced from these evidences that monetary policy alone may be grossly inadequate to significantly influence poverty rate in Nigeria. It then means that other macroeconomic policies like fiscal, income policies etc needs to be combined with monetary policy to effectively fight poverty in Nigeria. On the backdrop of the insignificant impact of the indirect monetary instruments (INTR, BSCE, BARR, BLQR, CBDR and INFR, the paper recommends as follows;

- Adoption of market-based interest management. This will make interest rate competitive and a major determinant of borrowing by investors to borrow and make investments. This will further create employment and enhance income and hence will influence poverty rate in the economy.
- Bank lending should be strictly channeled into the real or productive sectors of the economy and lending for speculative purposes should be highly discouraged. By so doing, banking sector's credit to the economy would enhance productivity, employment in the economy and hence, have positive impact on poverty reduction in Nigeria.
- Monetary authorities need to develop an all – inclusive policy to have firm control over the supply of money in the economy. The empirical result has shown that monetary authorities could not manage excess liquidity effectively in the economy through bank reserve requirements (BARR) and bank liquidity ratio (BLQR) to be able to influence poverty rate in the economy. It is imperative that such policies should have direct effect on the lending ability of commercial banks to direct their lending towards the productive sectors of the economy. This would enhance the potency of BARR and BLQR in the economy.
- Finally, for monetary instruments to be effective in influencing the productive sectors in the economy, the banking sector must be well developed in terms of the institution and instruments or financial assets and the transmission mechanism. A well developed and efficient monetary policy transmission mechanism enhances the transmission of changes in money supply to real sector of the economy which affects aggregate demand, prices, income, employment, output etc, and hence, poverty reduction.

References

- Adeyeye, V. A. (1999). Developing social safety Net for rural poor: Conceptual issues, evidence and policy choices for developing countries. Ibadan. Memio, *NISER*.
- Anderson, L.C. & Jordan, J.L. (1968). Monetary and fiscal actions: A test of their relative importance in economic stabilization. *Review Fed. Reserve Bank of St. Luis*, 1124
- Anderson, W.H.L. (1968). Tricking Down: The relationship between Economic .Growth and the extent of poverty among American families. *Quarterly Journal of Economics*, 78(Nov), 511-524.
- Ajakaiye, D.O. & Adeyeye, V.A. (2001). Concept, measurement and causes of poverty. *CBN Economic and Financial Review*, 39(4). 13-17.
- Ajayi, S.I. (1979). A econometric case study of the relative importance of monetary and fiscal policy in Nigeria. *Bangladesh Economic Review*, 2(2). 559-576.
- Ajisafe, J.O. & Folorunsho, A. (2002). The relative effectiveness of monetary and fiscal policies in Nigeria between 1970 and 1999. *Journal of Economic Management*, 5(20).18-21.

- Asogu, J.O. (1998). An Econometric analysis of the relative potency of monetary and fiscal policy in Nigeria. *CBN Economic and Financial Review*, 36 (2). 32-48.
- CBN, (2005). Living standards and poverty reduction. *Annual Report and Statement of Accounts for the year Ended 31 st Dec.* pp.76
- CBN, (2006). Living standards and poverty reduction. *Annual Report and Statement of Accounts for the year Ended 31 st Dec.* pp.89
- CBN, (2011). *What is monetary policy? Understanding monetary policy* series No. 1.39-40.
- Galbraith, J. K. (2007). The Fed's Real Reaction Function: Monetary Policy, Inflation, Unemployment, Inequality - and Presidential Politics. University of Texas: *Inequality Project Working Paper 42* .
- Fouda, E. S. Y. (2014). Does monetary policy really affect poverty? www.universite-yde2.org . Faculty of economics and management: university of Yaounde 2, Cameroon
- Goshit, G.G. (2014). *Impact of Indirect monetary instruments on Macroeconomic Performance in Nigeria (1986-2012)*. Unpublished Ph.D Thesis in the Department of Economics, University of Jos, Nigeria.
- Jhinghan, M.L. (2004). *Monetary Economics*. Delhi: Vrinda Publishers (p) Ltd. 326 – 432.
- Kang, S. J. Chung, Y.W. & Sohn, S.H. (2013).The effects of monetary policy on individual welfares. *Korea and the World Economy*, 14(1). 1-9.
- Mckinnon, R.I. (1971). Exchange flexibility and monetary policy. *Journal of money, credit and Banking*, 3(2). 5-7.
- Mundel, R.A. (1968). *International Economics*. New York. Macmillan Publishers.
- Nnanna, O.J. (2002). Monetary policy and exchange rate stability in Nigeria. *CBN Economic and Financial Review*, 40(3). 3-4.
- Nwaobi, G. (2001). Monetary policy and output interaction in Nigeria: An econometric investigation using multivariate Cointegration technique. *CBN Economic and Financial Review*, 37(3). 8
- Nzekwu, G. (2006). Exchange rate stability and poverty reduction in Nigeria. *CBN Bullion*, 30 (3): 56.
- Ogwuma, P.A. (1979). An effective monetary policy for Nation building. *CBN Bullion*, 21(3). 3-10.
- Ojo, M.O. (1992). Monetary policy in Nigeria in the 1980s and prospects in the 1990s. *CBN Economic and Financial Review*, 30(1).2 – 25 .
- Oni, B. (2006). Employment generation: Theoretical and empirical issues. In NES: Employment generation in Nigeria. Selected papers presented at the 200 annual conference of the *Nigerian Economic Society (NES)*, Calabar, 22nd _24th August. 18-19.
- Romer, C.D. and Romer, D. H. (1989).Monetary Policy and the Wellbeing of the Poor. *Economic Review*, (Q 1):21-49.
- Tsenkwo, J.B. & Londuut, T.D. (2012). Does private sector deficit financing crowd – out private sector investment in Nigeria? Evidence from VAR analysis. *Jos Journal of Economics*, 5(1).126 – 127.