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Indirect Monetary Policy Reforms and Output Growth in Nigeria: An Empirical Investigation

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ABSTRACT

Monetary policy is a key element of macroeconomic management and its effectiveness is crucial to the overall economic performance of a country. Therefore, the role of monetary policy in ensuring sustainable macroeconomic stability and output growth is crucial to economic development. This explains why efforts are usually made by every economy to enhance the techniques and content of monetary policy. In Nigeria, monetary management has undergone several changes (reforms) since the inception of the Central Bank of Nigeria (CBN). These changes could be grouped broadly into two, namely, those changes which took place when monetary management was largely based on direct controls and those changes which took place in the process of moving away from such controls. The second category of changes, which started to evolve since the adoption of the Structural Adjustment Programme (SAP) is the focus of this paper. The paper investigates the impact of indirect monetary policy reforms on output growth in Nigeria between 1986 and 2009. The methodology employed was the co-integration analysis and the Ordinary Least Squares (OLS). To characterize the time series property of the variables, the Augmented Dickey-Fuller (ADF) test was employed. A causality test performed on the models show that there was a-two-way causality between money supply and output growth during the reform period in Nigeria. The adjusted coefficient of determination (R^2) = 0.65 indicates that over 65% changes in the real GDP (RGDP), are explained by changes in the monetary policy variables. However, the result points to the fact that indirect monetary policy instruments have not been effective in stimulating the growth of output in Nigeria during the reform period.The paper submits that for indirect monetary policy instruments to be effective in influencing output growth, the banking sector of the economy also needs to be repositioned to be able to respond positively to the challenges of the conduct of monetary policy, particularly in compliance with the CBN requirements regarding the Central Bank discount rate (CBDR), bank liquidity ratio (BLQR), and bank reserve requirement in the economy (BRRE). The efforts in repositioning these banks through

the current banking reforms (recapitalization and consolidation) the paper notes are a right step in the right direction.

Key words: Indirect monetary policy, Granger – causality, output growth

INTRODUCTION

The primary mandate of the Central Bank of Nigeria as a monetary authority is to ensure price stability and output growth in the economy. To achieve these objectives, the CBN has over the years employed several strategies. Initially, the bank used direct instruments of monetary policy such as credit ceilings on individual banks, direct control on deposit and lending rates, and sectoral allocation of credit and/or the cost of providing such credit to individual sectors. Ojo (1992) submitted that that was very cumbersome and banks obeyed mostly in the breach especially by window dressing their accounts at the end of the month. Moreover, direct monetary control led to financial disintermediation and the emergence of non-bank financial institutions that were not under strict supervision. As Ojo (1992) succinctly put it, the inadequacy of the monetary control regime was clearly reflected in the developments during 1980-1985.Furthermore, Ogwuma (1996) posited that the monetary authorities had no effective grip on the growth of monetary aggregates in line with stipulated targets and the sectoral credit controls were also not very effective. The firm control over interest rates and the exchange rate was a source of instability in the monetary control regime (Sule, 2008). Government fiscal operations similarly constituted a major constraint on effective monetary control. In particular, the use of ways and means advances by the Federal Government to bridge shortfall in revenue and its growing magnitudes were not helpful to monetary control.

The most popular instrument of monetary policy was the issuance of credit rationing guidelines, mostly in the form of setting the rates of change for the components and aggregate commercial bank loans and advances of the private sector. Occasionally, special deposit requirements were imposed to reduce the amount of free reserves and credit-creating capacity of the banks. The sectoral distribution of bank credit in CBN guideline was to stimulate the productive sectors and thereby stem inflationary pressures. Minimum cash ratios were imposed on banks in the mid-1970s on the basis of their total deposit liabilities, but since such cash ratios were usually lower than those voluntarily maintained by the banks, they were less effective as restraint on the banks' credit operations. Therefore, until the mid-1980s the Nigerian economy, like those of many other developing countries, was highly regulated as government maintained tight control over its financial system.

Hence, the experience with regulation as Ikhide and Fajingbesi (1990) submitted, was not very beneficial to the economy. In particular, the practice of direct monetary controls has caused a lot of difficulties to the

economy. Some of these were inherent in the nature of the controls, while others resulted from contradictions in the control mechanism, thereby suffocating external conditions and other government policies. For instance, the ceilings on interest rates, even with the best of intentions, particularly the desire to provide low-cost funds to encourage investments for priority sectors, hindered financial deepening and prevented financial resources from being directed into their most efficient use. The imposition of ceilings on interest rates encouraged disintermediation as savers and investors opted for alternative outlets outside the formal financial system to conduct their businesses. Ikhide and Fajingbesi (1990) remarked that the use of credit ceilings was completely ineffective in the control of domestic credit. The sum effect of the direct monetary management in the economy manifested in dwindling productivity and the low level of domestic output growth of the various sectors of the economy. This was as a result of the inability of the direct monetary policy to stimulate and enhance productivity in the economy (CBN, 2004). In totality, the productive sector experienced output decline. The situation was compounded by the sharp drop in oil revenue as a result of the second oil shock of the early 1980s. All efforts designed to address the ensuing economic problems namely the Economic Stabilisation Act of 1982 and the Economic Emergency Act of 1985 could not effectively address the problems. By mid – 1986, a decision was taken to radically restructure the economy. On June 27th 1986, President Babangida announced the Structural Adjustment Programme (SAP) to cover the period July 1st 1986 to June 30th 1988 (2 years).This therefore marked the beginning of the extensive use of (market-based) indirect instruments of monetary policy in Nigeria.

It is important at this point to make a distinction between direct and indirect techniques of monetary policy. Direct techniques set or limit the desired quantities of monetary variables. They include interest rate ceilings and administrative determination of interest rates, quantitative restrictions on bank credit expansion, mandatory holding of government securities and sectoral allocation of credit. The use of these techniques was widely abandoned in 1986 when it became obvious that it resulted in substantial misallocation of resources, because prices did not reflect their true value, thus sending wrong signals to investors and savers (Adeoye, 2007).

On the other hand, indirect (or market-based) techniques focus on the underlining demand for, and supply of, financial assets. In contrast to direct techniques, they target the balance sheet of the Central Bank while the direct techniques focus on the balance sheet of deposit money banks (DMBs). The adoption of the indirect mechanism required interest rate policy to become the most important instrument of monetary management, aimed at regulating the cost of credit by deposit money banks, with the minimum rediscount rate (MRR) as the nominal anchor for all money market interest rates. The purpose of varying the interest rate is to alter the demand for, and supply of, financial assets in the direction that is consistent with the overall objectives of monetary policy, including output growth and inflation (CBN, 2007).

In line with the policy of financial sector liberalization that accompanied the Structural Adjustment Programme (SAP) in the second half of the 1980s, the CBN embarked on the transition process from direct to indirect techniques of monetary management.

This paper therefore seeks to investigate the impact of this policy change from the direct to indirect instruments of monetary policy on the output growth of the economy. To achieve this purpose, the paper is structured into six sections with the introduction as section I. Section II deals with conceptual and theoretical issues of managing an economy, monetary policy and output growth. Section III specifies the methodology of the study. Section IV deals with the estimation results and empirical analyses, and section V presents the concluding remark of the study.

Conceptual and Theoretical Issues

Keynes (1936) explains how government could affect the level of output and employment through monetary and fiscal policies. Following the great depression of the 1930s, in which there was massive decline in economic activities and high level of unemployment, Keynesian theorists posit that free market economy will collapse in future due to general overproduction and chronic under-consumption and declining marginal efficiency of capital. The Keynesians then asserts that the only panacea for the economy is deliberate government intervention (Jhingan, 2002). Thus, the Keynesian theory favours government involvement in the economic and business activities. To the Keynesian theorists, it is worthwhile for state intervention in the management of an economy, to enable government to perform its allocation, distribution and stabilization functions. Jhinang (2002) posits that the allocation function of the government has to do with provision of social/ public goods and addressing the issue of market failures as well as ensuring efficient allocation of resources between social and private goods. Distribution has to do with the adjustment of the distribution of income and wealth to ensure equity. While stabilization function has to do with the use of budget policy as a means of maintaining high employment, a reasonable degree of price stability, and an appropriate rate of economic growth, with allowances for effects on trade and on balance of payments.

In recent times, liberal and neo-liberal theories have expressed support for the Keynesian and Classical theories respectively. It is important however, to note at this point that many aspects of economic reforms in Nigeria today are based on the classical theory (Abdul-Rahahman, 2005).

The primary goal of monetary policy is the maintenance of domestic price and exchange rate stability as critical condition for the achievement of sustainable economic growth and external viability. Essentially, a stable macroeconomic environment will catalyze output and employment growth such that the standard of living of the citizenry would improve. However, the question as to whether monetary policy can or cannot achieve these objectives is at the centre of the controversy between Monetarist and

Keynesians. What is important from the submissions of both schools of thought is that the policy strategy for the achievement of these goals in any economy is often influenced by the stage of development of the economy, including its financial infrastructure.

The question of whether an expansionary monetary policy (MP) or fiscal policy (FP) will help to raise output starts from the basic Keynesian model. In general, either an increase in government expenditure or expansionary monetary policy, leading to an increase in investment via lower interest rate, will lead to an increase in output. Nevertheless, for many years, and to some extent and even now, there is the view that Keynesians ascribe that only fiscal policy can affect income and output, while monetarists believe that only monetary policy can have such an effect. While it is generally agreed that monetary policy actions have an important impact on the economy, there is much less of a consensus regarding how to measure and analyze the effects of these actions (Oyejide, 2002). There are, at least, two major reasons for this. One relates to the continuing debate on the transmission mechanism of monetary policy, other has to do with the characteristic slow adjustment of economic agents to changes in monetary policy. One view of the transmission mechanism is that monetary policy actions affect the economy primarily through their impact on the money supply. This view suggests that the Central Bank should focus on controlling money supply in the implementation of monetary policy. Another perspective postulates that interest rates as well as money supply have important effects on the economy. Hence monetary policy actions influence the economy through both availability of credit and its price.

The first view implies that monetary policy actions affect the economy primarily by determining aggregate spending which, in turn, directly affects the production of goods and services and, hence, the unemployment and inflation rates. The second view elaborates these relationships further by postulating that monetary policy actions influence a wide range of financial and non-financial variables which, in, turn, affect the spending and decisions of economic agents. In this context, the effects of monetary policy actions are reflected first on financial variables, such as the discount rate and monetary base, which are closely related to reserve positions of banks and are controllable with some precision by the Central Bank. As changes in these variables impact on the reserve positions of banks, their willingness to lend is affected and they are induced to adjust their portfolios. This adjustment results in changes in the relative yields on a wide spectrum of real and financial assets which, in turn, directly affect the spending behaviour of households and enterprises.

As indicated earlier, changes in the spending behaviour of economic agents lead to corresponding changes in aggregate production income. However, the effect of the original monetary impulse does not end there. It leads to a cyclical effect: changes in aggregate production and income result in further changes in the demand for money and credit, which also generate additional changes in portfolio choices, cost and availability of credit and

total wealth, which lead to further changes. It would take time for these changes to fully work themselves out. Because economic agents react with a lag to the impact generated by monetary policy actions, because of the complexity of the interrelations among various sectors of the economy, and because of ripple effects of the feedback processes involved, the ultimate impact of monetary policy actions on aggregate production, income and prices may occur over a period of several months or even years. As a result, it is analytically difficult to predict the timing and the magnitude of the effects of a particular monetary policy action (Oyejide, 2002).

The nature of relationship between indirect monetary policy and output is of important policy consideration because rapid growth is crucial for poverty reduction. One of the most popular characterizations of the nature of this relationship is the quantity theory of money, which links money stock to the value of output that it finances (Masha, 2002). Kalulumia and Yourogou (1997) have investigated the relationship between money and output and have found that there is a long-run relationship between money, prices, output and real exchange rate in Nigeria. It addition, it was found that broad money causes changes in real output in Nigeria.

Jinghan (2004) posited that a direct and simple relationship between monetary policy and output is that expansionary monetary policy enhances and increases output in an economy, all things being equal. The expansionary monetary policy enhances output through the employment of more resources in the economy. Monetary policy promotes sustained economic growth in the economy in two ways. Firstly, monetary authority might be entrusted with the responsibility of maintaining equilibrium between the total money demand and the country's total productive capacity. The fulfillment of this important responsibility calls for a flexible monetary policy aiming to restrict bank credit when the total demand threatens to raise prices and create conditions of unsustainable boom to expand credit when a deficiency of total demand causes decline in the prices and employment in the economy (Nzekwu, 2006).

The view that Keynesians expressed that only fiscal policy can affect income and output, while monetarists believe that only monetary policy can have such an effect, turns out to be that in certain special cases, only fiscal policy works and in another special case, only monetary policy works. It has, however, been observed that only fiscal policy will work, and monetary policy will not have any effect, if one of the links between changes in money supply and changes in investment is broken. The account of Keynesian theory concentrates on the liquidity trap as the extreme Keynesian special case. The important implication of the liquidity trap is that once the interest rate has fallen, to the level at which the liquidity trap occurs; an increase in the money supply will not reduce the interest rate any further. Therefore, if the level of investment which could occur at this minimum rate of interest is still not great enough to provide expenditure equal to full employment output, then monetary policy will not be able to increase investment and thereby restore full employment and income by this route.

However, in a liquidity trap, an increase in government expenditure will still increase output. In fact as long as we remained in liquidity trap, an increase in government expenditure will have the full effect on income predicted by the multiplier because interest rates does not rise at all and there is no crowding out of private investment to offset any of the effects of the increase in government expenditure. Hence, the support for the fiscal action of the government to boost output. On the other hand, those who accuse Keynesians believe that only fiscal policy can work, and that monetary policy cannot, then pointed out the extreme unlikelihood of liquidity trap, and the lack of evidence that it has ever occurred. It seems however, that most of those Keynesians who claim that monetary policy cannot raise income did not have liquidity trap in mind (Blau, 1998). Instead they usually based their view on the other link between monetary policy and investment. In this respect, Ajisafe and Folorunso (2002) posited that if investment is completely insensitive to the rate of interest, then monetary policy will have no effect even if it does to a fall in the interest rate accept that investment is sensitive to interest rate. By now, virtually all economists accept that investment is sensitive to interest rate.

METHODOLOGY

The relationship between the various measures of monetary policy and output growth are examined in this section. Several empirical methods can be used to investigate the relationships between various economic aggregates and the financial variables that may be regarded as appropriate indicators of monetary policy (Oyejide, 2002). When the method requires the use of sufficiently disaggregated structural model of the economy whose parameters are estimated, several types of questions can be answered, including the following:

- What are the effects of the specific monetary policy action on particular goal variables?
- What are the mechanisms through which the monetary policy action is transmitted to spending behaviour of economic agents?

This paper limits itself to the first question which tries to investigate the effects of monetary policy actions on a particular goal variable (output) in Nigeria. Ogwuma (1994) accepts the idea that the most relevant criterion for assessing the impact of monetary policy on the Nigerian economy is the achievement of the ultimate targets of economic policy. Since data employed are time series, an ordinary least square (OLS) method was used to estimate the model parameters. Time series properties of the data were examined by carrying out unit test as well as Johansen Co-integration test. Granger-Causality tests were conducted to corroborate the results obtain from OLS.

In evaluating the impact of monetary policy reforms on output growth in Nigeria, this study consider money supply as the major monetary policy

variable which monetary policy reform could influence in order to affect the level of output.

The Granger-Causality Model

The question whether money causes output appears to be important for many economists working in the area of macroeconomics. One often applied method to investigate the empirical relationship between money and real activity is Granger –causality analysis (Granger, 1989). The basic principle of Granger-causality analysis (Granger, 1989) is to test whether past values of monetary aggregate help to explain current values of output. The causality test is necessary in this study to determine whether money supply which is a major monetary variable representing monetary policy reform causes output or output causes money supply in the economy. Therefore, the objective here is to determine the causality between money supply and domestic output in Nigeria between 1986 and 2009. While money supply here is defined to refer to bank demand deposits plus the currency in circulation (M2), domestic output is proxied by the real Gross Domestic product (RGDP). According to Granger (1989), two series, say money supply (Ms) and real output (RGDP) are said to be mutually dependent (that is, display two-way causality), if RGDP causes Ms and Ms causes RGDP which may be symbolically written as:

$RGDP_t <-> Ms_t$ ..... (1)

Therefore in determining the causality between money supply and output; that is Money supply (Ms) causes output (RGDP) is functionally written as:

$RGDP_t = f(RGDP_{t-1}, Ms_{t-1}, Ms_{t-2}, Ms_{t-3})$…….(2a)

Where $f_1, f_2, f_3, f_4 > 0$

And output (RGDP) causes Money supply (Ms) is functionally written as:

$Ms_t = f(Ms_{t-1}, RGDP_{t-1}, RGDP_{t-2}, RGDP_{t-3})$……(2b)

Where $f_1, f_2, f_3, f_4 > 0$

Where Ms_t is current money supply, Ms_t-i (i=1,2…), are lagged values of money supply;$RGDP_t$ is current RGDP (output),$RGDP_t$-i (i=1,2…), are lagged values of RGDP (output).

The Model

This section is pre-occupied with the formulation of an appropriate macro econometric model, which theoretically establishes the relationships between our variables namely; domestic output growth and monetary policy variables (money supply, bank lending rate, Central Bank discount rate, bank reserve ratio, bank liquidity ratio and banking sector credit to the economy). The gross domestic product (GDP) is a measure of the total flow of goods and services produced by the economy over a specified time period, normally a year, expressed in monetary terms. It is obtained by valuing outputs of goods and services at market prices, and then aggregating. Immediate goods are excluded, and only goods used for final consumption or investment goods

(capital) or changes in stocks are included. Ojo (1994) posited that the GDP represents economic growth of any nation and is the principal yardstick of macroeconomic performance. Therefore, in this study, the real GDP stands a good proxy for domestic output. On the other hand, the supply of money is determined by the activities of the government, the banking sector and the non-banking public. The government affects money supply through its revenue generation, expenditure and borrowing while the banking sector affects it through the amount of excess reserve they keep. The non-bank public affects it through their decision on the amount of money they hold and their general assets portfolio management. Therefore, the volume of money supplied in the economy which is determined by the government, the banking sector and the non- bank public influences the economy through these monetary policy variables: bank lending rate, Central Bank discount rate, bank reserve ratio, bank liquidity ratio and banking sector credit to the economy.

Bank lending rate is used here as one of the monetary variables because it is a good monetary determinant of output in the economy through investment. Nigeria has consistently used both monetary and fiscal policies in order to secure expansion in aggregate output in the economy. The impact of such policies vis-à-vis the determination of domestic output can be traced through the joint equilibrium in money and product markets. The product market requires that induced investment be equal to savings.

The Central Bank discount rate, bank reserve requirements, and bank liquidity ratio are included in the model because they are all monetary variables that when influenced by the Central Bank, will affect money supply in the economy, and hence the total output. The banking sector credit to the economy is included in the model because this also influences the total money supply in the economy.

Therefore in considering influence of monetary policy on domestic output growth, the level of output can be expressed as a function of monetary variables such as money supply, Bank lending rate, Central Bank discount rate, bank reserve ratio, bank liquidity ratio, and banking sector's credit to the economy. But we know that output in an economy is a function of a number of variables, both financial and non-financial such as government fiscal policies, geographic, human and other natural factors (Ochejele, 2000). Our model is however built on the relationship between output and monetary policy variables. Thus our output equation is expressed as:

$RGDP_t = f(Ms_t, BALR_t, CBDR_t, BRRE_t, BLQR_t, BSCE_t)$…….(4)

The equation can be expressed in a log linear form as:

$$LogRGDP_t = \alpha_0+\alpha_1 logMs_t+\alpha_2 BALR_t+\alpha_3 logCBDR_t+\alpha_4 logBRRE_t +\alpha_5 logBLQR_t +\alpha_6 logBSCE_t + V_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

The a priori signs of the parameters are; $\alpha_1, \alpha_3, \alpha_6 > 0$; $\alpha_2, \alpha_4, \alpha_5 < 0$.

Where;

$RGDP_t$ = Real Gross Domestic Product

Ms_t = Money Supply

$INTR_t$ = Bank Lending Rate

$CBDR_t$ = Central Bank discount Rate
$BRRE_t$ = Bank Reserve Requirement
$BLQR_t$ = Bank Liquidity Ratio
$BSCE_t$ = Banking sector credit to the economy
V_t = Stochastic term (Error term)

1. Estimation Results and Empirical Analyses

Estimated Regression Model

$$LogRGDP_t = 11.22 + 0.49Ms_t + 0.04BALR_t + 0.04CBDR_t - 0.05BRRE_t + 1.17BLQR_t + 0.06BSCE_t \quad (6)$$

S.E. = (3.32) (0.10) (0.57) (0.04) (0.25) (0.81) (0.74)

T = (3.37) (5.02) (0.05) (0.07) (-1.93) (-1.57) (1.38)

Adjusted R^2 = 65
DW = 2.20
F = 0.00031

Table 1: Pair-wise Granger Causality Tests.

Sample: 1986- 2009
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
MS does not Granger Cause RGDP	22	8.22541	0.00317
RGDP does not Granger Cause MS		21.9064	2.0E-05

Table 2: Pair-wise Granger Causality Tests.

Sample: 1986 -2009
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Probability
MS does not Granger Cause RGDP	21	4.65071	0.01860
RGDP does not Granger Cause MS		26.8280	4.6E-06

The time series stochastic properties of all the variables were examined in order to have a reliable result. The estimation of the multiple regression, stationarity and co-integration test was based on annual time series. The exercise was carried out using Augmented Dickey-Fuller (ADF) test as articulated in Granger (1989). The results of the unit root tests of the variables, using ADF approach, are presented on appendix I and II. The ADF test was used to test for the unit root of the variables at level, first and second difference. All the variables are integrated of the order I (d). This means that some of the variables applied in the model are stationary at first difference, while others are stationary after differencing them twice. The variables that

are stationary at first difference include Real Gross Domestic Product (RGDP), Central Bank discount rate (CBDR), bank lending rate (BALR), Banking Sector's credit to the economy (BSCE) and bank liquidity ratio (BLQR). Other variables are stationary after the second difference.

Following the unit root test, a co-integration analysis was carried out to examine the long-run relationships among the variables. The results of the co-integration test on the structural model reveal the existence of the co-integrating relationship for all variables. Therefore, the variables so considered exhibit the tendency of co – moving in the long-run, which has a serious policy implication.

The Pair-wise Granger causality test was also carried out between money supply (Ms) and real gross domestic product (RGDP). Recent studies have shown that the conventional F-test for determining joint significance of regression – derived parameters, used as a test of causality, is not valid if the variables are non-stationary and the test statistic does not have a standard distribution (Gujarati, 1995). Therefore, in order to test the null hypothesis of no causality between money supply (Ms) and real GDP (RGDP), Pair – wise granger causality was adopted. The pair-wise Granger Causality test on Ms and RGDP are presented in Tables I and II. The results show that when more than one lag length was used, the results were consistently the same and indicate that there is a-two-way (bidirectional) causality between the two variables. This implies that Ms does granger cause RGDP and vice- versa.

The OLS results on appendix III shows that there is a positive relationship between money supply (Ms) and real GDP (RGDP) given the coefficient of 0.489759 which is also statistically significant at 5% level. This confirms the a priori expectation of positive effect of money supply on output growth during the reform period in Nigeria. Bank reserve requirement in the economy (BRRE) is also statistically significant at 10% level and it is negatively related to RGDP. This also agrees with the a priori expectation of negative effect of the bank reserve requirement on output growth in the economy during the reform period. On the other hand, CDBR and BSCE are statistically insignificant but they maintain their a priori expectations of positive signs, while BALR and BLQR are both statistically insignificant and only BLQR retains its negative a priori sign. The outcome of BALR contradicts the a priori expectation of the model.

Though the coefficient of determination (R^2) = 0.74, we are particularly concern with the adjusted R^{-2} (that has adjusted to degree of freedom). Our adjusted R^{-2} = 0.65 indicates that over 65% changes in the RGDP are explained by the joint linear influence of the regressors. In other words, over 65% changes in the real GDP (RGDP), are explained by changes in the monetary policy variables - money supply (Ms), Central Bank discount rate (CBDR), Banking sector's credit to the economy (BSCE), bank reserve requirement in the economy (BRRE), bank lending rate (BALR) and bank liquidity ratio BLQR). In line with the double log interpretation of regression coefficient, the OLS result shows that one per cent change in money supply will lead to 48% change (increase) in the mean value of $RGDP_t$ while one

per cent change in bank reserve requirement will lead to about 50% change (reduction) in $RGDP_t$.

The overall performance of the model as specified is statistically significant given its F-test result (0.000301) and the model is also free of autocorrelation as shown by the Durbin – Watson statistics (2.20) on appendix III. The information criteria based on Akaike information criterion (AIC) and Schwarz criterion (SBC) is given as 1.91 and 2.26 respectively, shows that the model was accurately specified and all variables are relevant in output determination during the reform period. The correlation results of the model on appendix IV also show that there is a significant and strong correlation or association between RGDP and Ms; between RGDP and BSCE between BSCE and Ms; and between BALR and CBDR.

Policy Issues and concluding Remarks

The principal aim of this paper is to test the effect of indirect monetary policy reforms on output growth in Nigeria and show the long-run relationship that exists between indirect monetary policy reforms and output growth using time series data from 1986 -2009. The co-integration results show that there exists a long-run equilibrium among the variables. That is, there is a long-run relationship between output and indirect instruments of monetary policy variables during the reforms period in Nigeria. The causality test also revealed that, there is a-two-way between money supply and output growth during the reform period in Nigeria. By implication, it means that money supply causes output and output also causes money supply. This further implies that money supply during the reform period is an important determinant of output growth in the economy.

The regression results show that only money supply is statistically significant and positively related to real GDP at 5% level while bank reserve requirements is significant at 10% level. This means that both money supply and the bank reserve requirements are good determinants of output growth during the reform period. However, even though indirect monetary policy variables such as the banking sector sectors' credit to the economy (BSCE), Central Bank discount rate (CBDR), and bank lending rate (BALR) are positively related to real gross domestic product (RGDP), they have not been able to significantly influence output growth during the reform era. So also, the bank liquidity ratio (BLQR) and bank reserve requirements (BRRE) which actually confirms the a priori expectations of the model have not also been able to have any significant impact on output growth during the reform period.

However, it is important to note from the regression results that the growth of money supply has implications for output growth during the reform period. The result also points to the fact that indirect monetary policy instruments have not been effective in stimulating the growth of output in Nigeria during the reform period. This is because the Central Bank discount rate (CBDR), bank lending rate (BALR), bank liquidity ratio (BLQR) and the

banking sector's credit to the economy (BSCE) are not significant in the estimated model as shown in the regression result on appendix III. The inability of the indirect monetary policy instruments to significantly influence output growth during the reform period could be blamed on the weak banking sector of the economy that was characterized illiquidity, insolvency, under capitalization, high level of non-performing loans, weak corporate and frequent bank collapse during the early and middle parts (1986-1995) of the reform period. Some of the limitations of the indirect monetary policy instruments to significantly influence output growth in the economy during the reform period could be attributed to various factors:

- Fiscal dominance: The fiscal expansion and large fiscal deficits have militated against the efficacy of monetary policy. The inadequate fiscal control at different tiers of government inhibits effective monetary policy. The accommodation of the financial requests of government was a major problem.
- Oligopolistic Banking system: Few banks controlled the liquidity of the banking system. These banks have influence as they dictate the rate of interest in the market regardless of the CBN's policy.
- Existence of large informal sector has great implication for the transmission of monetary policy.
- Inefficient Payment System: The payment system is a link between the financial and real sector. The preferred method of payment in Nigeria is cash. In Nigeria the payment is weak and this affects the transmission mechanism of monetary policy.
- The under developed nature of the money market: The market is still narrow in its depth and breadth of financial instruments.

However, the inability of the CBDR, BALR, BLQR, and BSCE to significantly influence output growth during the reform period does not relegate the importance of these indirect monetary policy instruments in any monetary policy formulation and implementation in the economy. It is therefore suggested that for any of these indirect monetary policy instruments to be effective and adequately used for stimulating output growth in Nigeria, supporting frameworks (financial, political and economic) has to be institutionalized or put in place. Particularly, in the case of the banking sector's credit to the economy (BSCE), if the commercial and other banks will channel a greater percentage of their credit to the real sector of the economy, rather than other quick return - yielding activities (e.g, imports and exports), a remarkable output growth would be achieved.

The paper submits that for indirect monetary policy instruments to be effective in influencing output growth, the banking sector of the economy also needs to be repositioned to be able to respond positively to the challenges of the conduct of monetary policy, particularly in compliance with the CBN requirements regarding CBDR, BLQR, and BRRE. The efforts in repositioning these banks through the current banking reforms (recapitalization and consolidation) are a right step in the right direction.

These would engender completion in the sector and would further enhance effective service delivery and would reduce interest on the banks' lending rate to influence output in the economy positively. This is predicated on the believe that the on-going banking reforms would improve the capital base of the banks to also respond to the challenging needs for credit needs availability to the real sectors of the economy and this would serve as an impetus to increase productivity in the economy.

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Appendix I: Johansen Co-integration Test Results.

Series: LRGDP LMS LCBDR LBSCE LBRR LBLR LBLQR

Eigen value	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.918190	155.1850	124.24	133.57	None **
0.796036	97.60778	94.15	103.18	At most 1 *
0.665281	61.04208	68.52	76.07	At most 2
0.582894	35.86939	47.21	54.46	At most 3
0.374126	15.75785	29.68	35.65	At most 4
0.182478	4.979907	15.41	20.04	At most 5
0.014927	0.345912	3.76	6.65	At most 6

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 2 co-integrating equation(s) at 5% significance level

Appendix II: Results of Tests for stationarity of variables (ADF Unit Root Tests).

SERIES	LEVEL	1ST	2ND	Critical Value at 5%	Oder of Integration
RGDP	0.0302	3.3213	5.2877	3.0114	I(1)
CBDR	2.0499	4.3297	6.4618	3.0114	I(1)
BSCE	1.42839	5.4663	6.6608	3.0114	I(1)
BALR	1.6908	4.524	6.9947	3.0114	I(1)
BLQR	1.8147	3.8254	5.8381	3.0114	I(1)
MS	2.7403	1.1398	3.5756	3.0294	I(2)
BRRE	1.1225	2.1295	6.6291	3.0199	I(2)

Source: Computed.

Appendix III: Estimated Results of the Model (using Ordinary Least Squares Technique).

Dependent Variable: LOG(RGDP)
Method: Least Squares
Sample: 1986 2009
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.22384	3.325911	3.374668	0.0036
LOG(MS)	0.489759	0.097420	5.027284	0.0001
LOG(CBDR)	0.040720	0.577902	0.070462	0.9446
LOG(BSCE)	-0.064187	0.046372	1.384169	0.1842
LOG(BRR)	-0.501406	0.258800	-1.937428	0.0695
LOG(BLR)	0.045272	0.817631	0.055369	0.9565
LOG(BLQR)	-1.172371	0.744382	-1.574960	0.1337

R-squared	0.741269	Mean dependent var	11.83130
Adjusted R-squared	0.649952	S.D. dependent var	0.946846
S.E. of regression	0.560200	Akaike info criterion	1.917447
Sum squared resid	5.335010	Schwarz criterion	2.261046
Log likelihood	-16.00937	F-statistic	8.117541
Durbin-Watson stat	2.202645	Prob(F-statistic)	0.000301

Appendix IV: Correlation results of the model.

	RGDP	MS	CBDR	BSCE	BRR	BLR	BLQR
RGDP	1.000000	0.890957	-0.479486	0.717300	-0.306931	-0.581891	-0.093922
MS	0.890957	1.000000	-0.457808	0.716490	-0.270435	-0.552171	-0.078275
CBDR	-0.479486	-0.457808	1.000000	-0.386113	0.218185	0.814561	-0.061059
BSCE	0.717300	0.716490	-0.386113	1.000000	-0.122276	-0.404847	-0.309106
BRR	-0.306931	-0.270435	0.218185	-0.122276	1.000000	0.394346	0.581860
BLR	-0.581891	-0.552171	0.814561	-0.404847	0.394346	1.000000	0.152723
BLQR	-0.093922	-0.078275	-0.061059	-0.309106	0.581860	0.152723	1.000000