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To determine the relative importance of both the domestic and external influences on monetary policy formulation, this paper constructs a broad monetary conditions index for Nigeria. It brings together the three key channels of monetary transmission, namely interest rate, exchange rate and credit channels. The result gives dominance to exchange rate channel, followed by credit channel and interest rate channel. The resultant monetary conditions index traces fairly well the policy direction of the Central Bank of Nigeria for the studied period, hence can serve as an adequate gauge of monetary policy stance of the Bank.

Keywords: Monetary Policy, Monetary Conditions, Monetary Transmission, Cointegration

JEL Classification: C33, E52, E58

1.0 Introduction

The use of monetary conditions index to gauge monetary policy stance and its possible effect on the economy, has gained prominence in many countries in recent times. Central banks are faced with the difficulty of pursuing multiple and sometimes conflicting objectives. They are saddled with the responsibility of ensuring price and financial stability, as well as enhancing growth. For central banks in the emerging economies like Nigeria, other objectives such as maintenance of optimal level of external reserves and stable exchange rate, as well as attainment of the desired current account balance constitutes additional challenge to monetary policy decision making process.

These multiple, as well as conflicting objectives, make it rather difficult for central banks to rely on a single channel of monetary policy transmission. The

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effects of monetary policy on output and prices pass through some critical financial variables such as interest rate, exchange rate, monetary aggregates, credit aggregates and asset prices. The effectiveness of monetary policy, therefore, depends largely on the understanding of the workings of these channels of transmission.

Globalisation and financial integration which facilitate easy flow of capital across the borders have raised considerable doubt about the stability of money demand function, hence renders monetary targeting increasingly irrelevant. Likewise, trade openness, motivated by globalisation and enhanced by financial integration prompted the adoption of floating exchange rate regime, thereby making exchange rate targeting gradually more ineffective and weak.

Central banks, especially those of the emerging economies, regardless of these developments still target quantitative aggregates in their monetary policy framework. However, most do not rely exclusively on either interest rate targeting or exchange rate targeting. Rather, the common practice is a mixture of both (Yaaba, 2011). The combination of the two helps central banks to assess the impact of both domestic and external macroeconomic factors on the overall monetary conditions of the economy. To determine the relative importance of both the domestic as well as external influences, the central banks spearheaded by the Bank of Canada (BOC) in the 1990s constructed a monetary conditions index (MCI) which brings together both rates to gauge the stance of monetary policy, as well as determines its efficiency (BOC, 1995).

The objective of this paper, therefore, is to construct and estimate a MCI for Nigeria, which can be used to gauge the monetary policy stance of the Central Bank of Nigeria (CBN), in terms of 'tightness' or 'easiness' of the monetary policy. This will serve as a guide to policy makers, policy analysts and players in the financial market in examining the degree of pressure simultaneously exerted on the economy by the monetary policy through interest rate and exchange rate either together or separately.

To achieve this, the paper is divided into five sections. Following this introduction, section 2 reviews relevant empirical literature on monetary conditions index. Section 3 explains the methodology, while section 4 estimates the broad monetary conditions index. The last section concludes the

paper by discussing some practical limitations and providing useful insight into policy implications of the result.

2.0 Empirical Literature

Following Stevens (1998), the transmission process of monetary policy can be viewed from the perspectives of monetary conditions index at time t as:

$$MCI_t = \omega_r(r_t - r_0) + \omega_e(e_t - e_0) \quad (1)$$

With $\omega_r + \omega_e = 1$. MCI represents the monetary conditions index, r_t is the short term real interest rate at time t, e_t is the natural log of real exchange rate at time t. r_o and e_o are real interest rate and natural log of the real exchange rate, respectively in a given base period. ω_r and ω_e are the weights attached to interest rate and exchange rate, respectively, in the MCI. These weights are derived from the estimated coefficients of r and e as they affect aggregate demand (AD) function.

Considering the inter-linkages between money market and foreign exchange market, the Bank of Canada (BOC) pioneered the construction of MCI in the 1990s. This brightens the prospect of the use of MCI to gauge monetary policy stance. The initial specification of the Bank of Canada's MCI was based on inflation, but later changed to aggregate demand. According to BOC this was done to avoid alarming the market with a one-and-for-all price shock which could be misinterpreted as an outburst of an inflationary spiral.

Various central banks, monetary authorities, regional organizations, investment firms, rating agencies and international financial institutions[2] had at different times constructed monetary conditions indices to gauge monetary conditions of different countries, for different purposes, using different approaches. While some central banks developed the index to serve as an additional tool of monetary policy, some construct it to gauge the monetary policy stance of their respective jurisdictions. On the other hand, the investment firms such as Goldman Sachs, J. P. Morgan and Deutsche Bank construct the index for the purpose of tracking the monetary policy direction of countries across the globe (Sonia, 2000). Policy makers, researchers and

[2] The Reserve Bank of New Zealand (RBNZ), the Norges Bank, the Bank of Iceland, the Bank of Sweden, as well as Organisation for Economic Cooperation and Development (OECD), International Monetary Fund (IMF) and European Monetary Institute (EMI)

economists also construct monetary conditions index for countries using different approaches.

Frochen (1996) constructed monetary condition indices for five European countries, namely France, Germany, the United Kingdom, Italy and Spain, using data from 1987 to 1995. The results showed that from 1990, monetary policy exerts significant influence on prices in France and Germany. The effect of monetary policy on prices from 1992 was, however, moderate for United Kingdom, Italy and Spain. When viewed from the perspective of the impact of monetary policy on real growth, lack of asymmetry was observed along the line of strength of the currency of the respective countries.

Kesriyeli and Kocaker (1999) use price objective function to construct a monetary conditions index for Turkey. The weights of the MCI in their approach are built to show the link between the operational target of monetary policy and the objective of price stability. The resultant MCI provides evidence in support of tight monetary policy throughout the studied period, but did not succeed in stabilising prices due to the expansionary fiscal policy stance of the government during the period.

Abdul (2002) constructed a monetary conditions index for Pakistan using monthly data from June 1999 to June 2001. He used likelihood ratio test based on maximal eigenvalue and the trace of stochastic matrix as proposed by Johansen and Juselius (1990) to determine the weights of both interest and exchange rates. The long-run parameters were estimated through Full Information Maximum Likelihood Method of Johansen. The estimated results yielded coefficients of 0.736 for interest rate and 0.264 for exchange rate. Hence, weights of variables in the monetary conditions index were 2.79:1. The resultant index provides evidence in support of tight monetary policy during the studied period. This, according to him is an indication that the monetary authority of Pakistan was interested in low prices during the period.

Tobias (2005) constructed a monetary conditions index for South Africa using annual data from 1994 to 2003. He concluded that, although the estimated parameters satisfied the *a priori* expectations, monetary conditions index recorded a mixed result during the studied period. They recommended that MCI should form part of tools of analysis by the monetary authorities in the monetary policy formulation process.

Kannan *et al*. (2006) constructed a monetary conditions index for India, considering the simultaneous impact of both interest rate and exchange rate to evaluate the stance of monetary policy in India. They classified MCI as narrow measure and broad measure. While the narrow measure considered the conventional variables (i.e. interest rate and exchange rate), the broad measure includes credit growth. Their results suggest that interest rate was more important than exchange rate in influencing monetary conditions in India.

Zulfiqar and Muhammad (2007) applied Johansen cointegration technique to derive the weights of interest rate and exchange rate in the monetary conditions index for Pakistan, using four systems of equations. They then used the coefficients of both rates derived from the estimations to obtain the weights of 1:-0.35 and 1:3.8 for inflation and output, respectively. This shows that interest rate is stronger in Pakistan than exchange rate when an inflation objective is considered, while the reverse is the case in terms of output objective. The resultant MCI showed monetary tightening in eight different periods and loose monetary stance in six periods. They, however, cautioned the applicability of monetary conditions index as a tool of monetary policy due to some observed limitations in the computation of MCI.

Pei-Tha and Kian-Teng (2008) constructed a monetary conditions index for Malaysia. They applied ordinary least squares on quarterly data spanning the period 1995:Q1 to 2006:Q4 to derive the weights of real interest rate and real exchange rate used for the computation of the MCI. The resultant weights were 1.6 and 1. The results, according to them, were in conformity with the *apriori* expectations and satisfy economic reasoning and could be used to detect the optimal monetary policy in Malaysia.

Lattie (1999) estimated a monetary conditions index for Jamaica using a small open economy model. He employed monthly data for the period September 1991 to December 1998. The result showed the usefulness of the index when there is stability in the foreign exchange market. According to him, the index embodied good information on, at least, the short-term direction of monetary policy. He submitted that MCI is capable of serving as a useful tool for the management of both external and domestic variables in the economy, as it is closely associated with domestic inflation, in addition to the ease of calculation. He, therefore, suggested the standardisation of the framework so as to use the index as an auxiliary operating target. He, however, emphasized

the need for a strong framework for forecasting inflation at least in the short-run, as a prerequisite for the adoption of the index as an operating target.

Jimmy and Jacob (2010) constructed a monetary conditions index for Uganda using additional target to augment the use of base money. They employed monthly data from October 1999 to March 2010 to model inflation determinant using likelihood method of Johansen to estimate long run parameters of the objective function. The estimated coefficients of interest and exchange rates were then adopted to derive the weights used in the construction of MCI. The result is a mixed one, revealing period of monetary tightening between January 2001 and May 2003 and loosening between September 2008 and July 2009.

Wai-Chang (2010) constructed an augmented monetary conditions index for the ASEAN-5 using quarterly data from 1980 to 2004. He employed the bound testing approach to cointegration to determine the key channels of transmission. The result revealed exchange rate, asset price and interest rate channels to be critical in the monetary policy transmission in Indonesia and Thailand, while exchange rate, short term interest rate and credit channels were the major transmission channels in Malaysia and Singapore. The transmission channels in Philippines included interest rate, exchange rate, asset price and credit. He found that augmented monetary conditions indices for the countries studied, tracked fairly well the movements of the real GDP to some extent, especially after 1997.

Oriela (2011) applied the ordinary least squares method on quarterly real interest rate and real exchange rate of Albania from 1998:Q1 to 2008:Q4. The result indicated that real interest rate is more important in Albania as the results showed that a one percentage point increase in real interest rate can neutralise up to 3.8 percentage point appreciation in real exchange rate.

Chow (2012) extended the model to cover the entire financial system of Singapore. He constructed an index that incorporates not only the monetary variables, but also asset prices including stocks and house prices. He applied a weighted-sum approach of index construction on quarterly data from 1978:Q1 to 2011:Q2. In this case, the weights of the components were derived from generalised impulse responses of monetary VAR model. The result showed that house price with weight of 40.0 per cent is highly important in

determining the rate of inflation. He, therefore, concluded that information on monetary policy could be derived from the financial conditions index (FCI) as it summarized reasonably well the financial conditions in Singapore. He finally suggested the construction of similar index for the entire Asian countries.

From empirical literature reviewed above, it is clear that, although weights of interest and exchange rates used in the construction of monetary conditions index can be derived in relation to growth rate or inflation rate, the growth equation is the most widely used.

3.0 The Model and Data Issues

Following the conventional[3] MCI as presented in equation (1) the standard formulation of the function of real GDP can be presented as follows:

$$y_t = \alpha r_t + \beta e_t \qquad (2)$$

Considering the peculiarities of the Nigerian monetary policy framework, however, there is the need to capture a variable that will provide information on other channel of monetary policy transmission to the real sector of the economy. Literature provides enough evidence in support of the criticality of credit stance as another important channel of monetary policy transmission [See Bernanke and Gertler (1995) and Kannan *et al*. (2006)]. Information on the evolution of the Nigeria monetary policy framework also reveals the emphasis placed on lending to certain sectors of the economy, particularly in the past where sectors are categorised as either preferred or less preferred in terms of credit allocation. Recent policy initiatives of the CBN with regard to interventions, in terms of allocation of credit to the sectors consider critical to the economy[4] is also a pointer to the fact that policy emphasis on credit allocation to certain sectors remains an important tool for monetary policy implementation in Nigeria.

Accordingly, the study expands the conventional MCI to include Deposit Money Banks (DMBs) credit to private sector. Consequently, and in line with Bernanke and Gertler, (1995), Stevens (1998) and Kannan et al (2006) the

[3] Also known as Narrow Monetary Conditions Index
[4] ₦500.0 billion intervention fund in the power, aviation and agricultural sectors

standard for the broad measure formulation of the function of real GDP can be modified as follows:

$$y_t = \alpha r_t + \beta e_t + \gamma c_t \quad (3)$$

Where *y* is real GDP, *r* denotes short term real interest rate, *e* represents real exchange rate, *c* is the real credit to the private sector, and the parameters α, β and γ are the coefficients of interest rate, exchange rate and credit to private sector, respectively. Following the approach of Wai-Ching (2010) *r* is measured by the difference between average lending rate and inflation rate, while *e* is the units of Nigerian Naira per unit of US dollar minus CPI. *C* is measured by DMBs credit to the private sector divided by CPI.

Based on equation (3), therefore, the proposed broad monetary conditions index, which is an amplified version of equation (1), becomes:

$$BMCI_t = \omega_r(r_t - r_0) + \omega_e(e_t - e_0) + \omega_c(c_t - c_0), \ \ \omega_r + \omega_e + \omega_c = 1 \quad (4)$$

An autoregressive distributed lag (ARDL) approach is adopted to estimate the weights of the broad monetary conditions index (BMCI). It examines the cointegration between output and the determinant variables. The technique is a valid asymptotic inference. The choice of ARDL is based on several considerations. One, the model yields a consistent estimate of the long run normal coefficients irrespective of whether the underlying regressors are stationary at I(1) or I(0) or a mixture of both. Two, according to Harris and Sollis (2003) it provides unbiased estimates of the long run model, as well as valid t-statistics even when some of the regressors are endogenous. Third, it yields high quality results even if the sample size is small.

The ARDL(4,4,4,4) format of equation (3) can be formulated as:

$$y_t = \gamma_0 + \sum_{i=1}^{4} \lambda_i y_{t-i} + \sum_{i=0}^{4} \beta_i r_{t-i} + \sum_{i=0}^{4} \delta_i e_{t-i} + \sum_{i=0}^{4} \zeta_i c_{t-i} + \mu_t \quad (5)$$

Where *y, r, e and c* are as defined in equation (4), γ_0 is an intercept term, λ, β, δ and ζ are parameters to be estimated.

The weights of the broad monetary conditions index are then derived from the coefficients of interest rate, exchange rate and DMBs credit to private sector and then substituted in the BMCI equation[5] (i.e. equation 4) to derive the BMCI for Nigeria covering the sample period.

Quarterly data spanning from the period 2004:Q1 to 2012:Q2 were used to estimate the weights of the broad monetary conditions index. The choice of the study period is to minimize possible errors arising from the interpolation of annual GDP to quarterly GDP. From 2004:Q1 the quarterly GDP series are directly obtained from the field, through the collaborative efforts of the CBN and National Bureau of Statistics (NBS). The data set on gross domestic product, interest rates, exchange rate, credit to the private sector and CPI are obtained from the Statistical Bulletin of the Central Bank of Nigeria (CBN).

4.0 Empirical Result

4.1 Time Series Properties of the Data

Table 1: Unit-Root Test (Augmented Dickey-Fuller and Phillips-Perron)

Variable	Augmented Dickey Fuller						P-P test statistics	
	AIC		SBC		HQC			
	Level	First Diff.	Level	First Diff.	Level	First Diff.	Level	First Diff.
y	-2.18644	-9.120702*	-2.18644	-9.120702*	-2.18644	-9.120702*	-2.59462	-8.003341*
c	-1.17676	-4.403121*	-1.17676	-4.403121*	-1.17676	-4.403121*	-1.53580	-4.455376*
e	0.73196	-4.745985*	0.73196	-4.745985*	0.73196	-4.745985*	0.67224	-4.739523*
r	0.48011	-4.466854*	0.48011	-4.466854*	0.48011	-4.466854*	0.35532	-4.464161*

*Notes: * , ** and *** significant at 1%, 5% and 10%, respectively.*

The Augmented Dickey Fuller (ADF) based on Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Criterion (HQC); and Phillips-Perron (PP) tests are employed to check the presence of unit roots in the series. Table 1 shows that all the series are I(1) variables and significant at 1.0 per cent. This reveals that the data does not contain I(2) series, hence provides support for the use of ARDL model.

[5] Equation (4) can also be represented as $BMCI_t = (r_t - r_0) + {}^{\omega_e}/_{\omega_r}(e_t - e_0) + {}^{\omega_c}/_{\omega_r}(c_t - c_0)$

Table 2 : Statistics for Selecting Lag Order of the Model

ρ	0	1	2	3	4	5
AIC	30.2930	29.7185	29.4604	29.3711	29.1228*	29.1402
SBC	30.4725	30.0359	29.9185	29.9724*	29.8701	28.8360
HQC	30.3542	29.8253	29.6123	29.5672	29.3618*	29.3808

Note: *ρ is the lag order of the model. AIC denotes Akaike Information Criterion, SBC is Schwarz Bayesian Criterion, HQ is Hannan Quinn Criterion * optimal lag length*

The appropriate lag length ρ for the error correction model is selected based on Akaike Information Criterion (AIC) and Hannan-Quinn Criterion (HQC). This is, because, as presented in Table 2, while SBC considers the optimal lag length to be 3, both AIC and HQC agree on lag 4, which is consistent with theories relating to optimal lag length of quarterly series. The calculated F-statistic (F-statistic = 4.48) indicates that the estimated model ARDL(1,0,0,0) attained after parsimony for the long-run coefficients is adequately specified.

Table 3: Estimated Long-Run Coefficients ARDL(1,0,0,0)
Dependent Variable: y_t

Variable	Coefficient	t-Statistic	Prob-Value
γ_0	-0.8592	-0.8679	0.3928
y_{t-1}	0.7406	8.3170	0.0000
r_t	-0.0393	-3.1011	0.0044
e_t	0.7402	3.2932	0.0027
c_t	0.1365	2.6611	0.0127

R2 = 0.97, F-Stat (3,28) = 4.48 [0.000], Durbin Watson = 2.0324

Adjusted R2 = 0.96. AIC = -2.403778, SBC = -2.177034, HQ = -2.327485

The relevant critical values for unrestricted intercept and no trend under 3 variables for 0.05 is 3.23 - 4.35. They are obtained from Persaran et al.

Table 3 indicates that the overall model is well fitted as the independent variables exert about 97.0 per cent ($\overline{R}^2$) influence on the dependent variable. The coefficients of all variables are correctly sign as expected. For instance, interest rate is negatively associated with output, implying that a rise in interest rate dampens aggregate output and vice versa. A one per cent increase in interest rate leads to about 0.04 percentage point decrease in output. Both credit to private sector and exchange rate are positively related to output. This indicates that, as credit to the private sector increases, so does output and vice

versa. In this case, a one per cent increase in credit to private sector exerts about 0.14 percentage points increase on output. The same applies to exchange rate.

The stability of the estimated parameters is tested using cumulative sum (CUSUM) of recursive residual and cumulative sum of squares (CUSMSQ) of recursive residual tests. Both Figures 1 and 2 (CUSUM and CUSUMSQ) show that the estimated parameters of the analysed equation are stable, given that the recursive errors lie within the critical lines of 0.05 per cent.

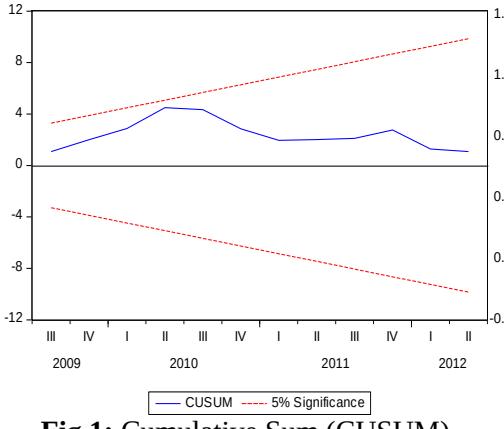

Fig 1: Cumulative Sum (CUSUM) Recursive Residual Tests

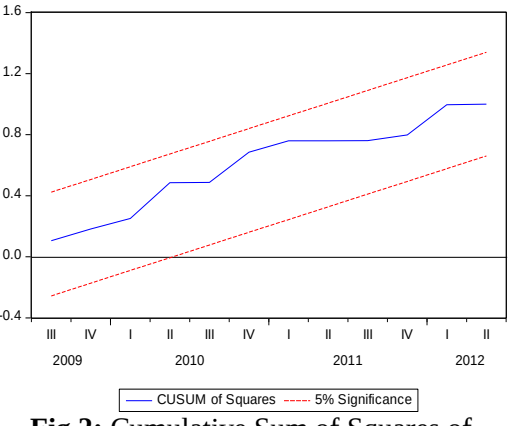

Fig 2: Cumulative Sum of Squares of (CUSMSQ) of Recursive Residual Test

4.2 Monetary Conditions Index for Nigeria

From the estimated ARDL equation reported in Table 3, the coefficients of interest rate, exchange rate and credit to private sector are -0.0393, 0.7402 and 0.1365, respectively. The weights of the variables ω_r, ω_e and ω_c as presented in equation (4), therefore, become -0.0469, 0.8839 and 0.1630, respectively. Thus, equations (4) can be represented as:

$$BMCI_t = -0.0469(r_t - r_0) + 0.8839(e_t - e_0) + 0.1630(c_t - c_0) \qquad (6)$$

Equation (6) suggests a higher weight for exchange rate channel in determining the level of aggregate output in Nigeria, followed by credit to private sector and interest rate. This result seems to reflect the evolving dynamics of the Nigeria economy and consistent with some earlier results on MCI. For instance, Wai-Ching (2010) got similar result for Indonesia, Thailand, Malaysia and Singapore. According to him, exchange rate channel is the major driver of GDP in these countries. The result is, however, not in

consonance with that of Sonia (2000), who opined that if MCI is estimated from the perspectives of aggregate demand, interest rate effect prevails over exchange rate effect and reverse is the case if the weights are estimated from inflation perspective. This is because, besides the effect of exchange rate via aggregate demand, it exerts a fairly direct impact on prices through imports. Kannan et al (2006) and Oriela (2011) reported results for India and Albania similar to that of Sonia.

Figure 3 depicts the broad MCI. The BMCI considers 2008:Q3 as the base period, hence the base period is equal to zero. Therefore, any level of the BMCI above zero implies monetary loosening comparatively to the base period, while levels below zero are indications of restrictive monetary conditions. Visual inspection of figure 3 shows that there was monetary easing, comparatively to the base period, from 2004Q1 to 2005Q4. Within this period of restrictive monetary conditions, the first quarter of 2004 experienced a relatively more tightened policy regime. This reflects, to a large extent, the non-accommodative monetary policy stance of the CBN within the period (CBN, 2004).

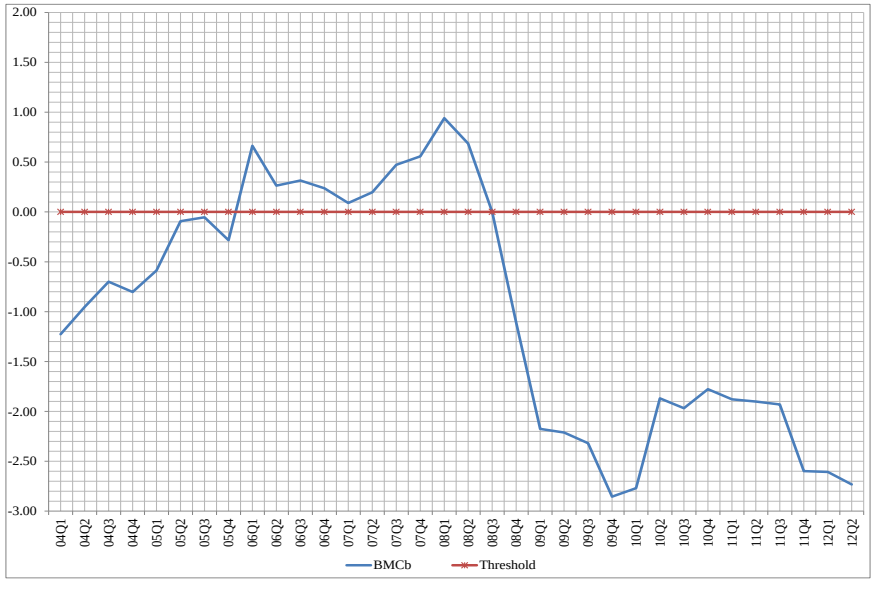

Figure 3: BMCI for Nigeria, 2004Q1 - 2012Q2 (2008Q3 Base Period)

The DMBs credit to the domestic economy rose gradually from ₦1,922.8 billion in 2005, to ₦4,968.9 billion in 2007 and ₦7,909.8 billion in 2008,

reflecting increase of over 500.0 per cent within the period. Similarly, the prime lending rate (PLR) declined continuously from 16.30 per cent in the first quarter of 2006 to 15.26 in the fourth quarter of 2008, representing decline of over 21.0 per cent during the period. The maximum lending rate (MLR) followed suit as it declined steadily from 17.89 per cent in the first quarter of 2006 to 17.58 per cent in the first quarter of 2008. The downward trend of PLR complimented by MLR gradually set the pace for accommodative monetary conditions between the fourth quarter of 2005 and third quarter of 2008. In addition, CBN injected about ₦105.54 billion and ₦145.68 billion into the banking system in March and April 2007, respectively. This is the yield on cash reserve ratio (CRR) invested on behalf of the DMBs following the reduction in the required reserves from 5.0 per cent to 3.0 per cent which matured in 2007.

The most accommodative monetary conditions index recorded in the first quarter of 2008 is a reflection of the deliberate effort of the CBN to inject liquidity into the economy so as to restore confidence in the Nigerian banking system arising from the global financial and economic crisis that emanated from the US at the beginning of the year. This is also in tandem with the global effort by the monetary authorities to resolve the global financial crisis. Although, the CBN twice reviewed upward the monetary policy rate (MPR)[6] in the first half of 2008 to contain inflationary threat associated with huge liquidity in the system that emanated from the excess crude oil receipt which leads to increased statutory revenue to the three tiers of government in the second quarter of 2008. But with the moderating effect of standing lending facility, interest rate remained fairly stable throughout the period. Prime lending rate fell slightly further from 16.46 per cent in the last quarter of 2007 to 15.23 per cent in the first quarter of 2008 and further to 15.17 per cent in the second quarter. Similarly, maximum lending rate marginally narrowed to 17.58 per cent in the first quarter of 2008 from 18.21 per cent in the fourth quarter of 2007. Credit to the private sector rose by 33.9 per cent compared to the second quarter of 2007.

From 2009:Q1, however, monetary conditions became restrictive. It was tightened in the first quarter of 2009. Although, the MPR was reduced from 9.75 in the first quarter of 2008 to 8.0 per cent before the end of the second

[6] The MPR was reviewed twice from 9.50 per cent in December, 2007 to 10.0 per cent in April, 2008 and later reviewed upward by 25 basis points in June, 2008.

quarter of 2009, both MLR and PLR increased gradually to 19.55 and 23.77 per cent at the end of 2009:Q4 from 15.26 and 21.15 in 2008:Q4, exchange rate depreciated rapidly from ₦120.65 to ₦146.88 at the end of the first quarter of the year.

The negativity in the BMCI continued throughout the remaining part of the studied period, although, it was almost stable between the first and second quarters of 2009, it however, fell in the third quarter of the year and reached the bottom in the fourth quarter. The monetary conditions eased in the first and second quarters of 2010 but not as accommodative as the base period. It eased gradually from -2.85 in the fourth quarter of 2009 to -1.93 in the third quarter of 2011. This occurred due to series of interventions by the CBN to ensure stability in the financial system which led to stabilisation in the money market rates. This period also experienced special interventions in the banking system to stabilise some banks with eroded capital base[7]. Interest rate corridor around the standing facilities operations was also re-introduced; MPR was reduced from 9.75 per cent to 8.0 and further to 6.0 per cent. In the same vein, the liquidity ratio was reduced from 30.0 per cent to 25.0 per cent, while CRR was reduced from 2.0 per cent to 1.0 per cent. Despite the accommodative monetary policy, however, both prime and maximum lending rates increased to19.03 and 23.62 per cent by the end of the 2010Q1.

The monetary policy trust of the CBN for the fiscal year 2010 was intended to be accommodative as the CBN introduced a ₦500.0 billion intervention fund to facilitate credit flows to the real sector of the economy, out of which ₦200.0 billion was meant for manufacturing refinancing and restructuring and ₦300.0 billion was for power and aviation sectors. AMCON[8] also commenced operations towards the end of the year. The monetary easing was also aimed at curtailing the rampaging effect of the global financial and economic crisis as well as resolves the outstanding internal problems of the DMBs, and this fairly yielded the desired effect as the monetary conditions eased gradually from -2.77 in the first quarter of the year to -1.78 before the year runs-out. The -1.78 BMCI achieved in the last quarter of 2010 can largely be attributed to the fall in both PLR and MLR to 15.74 and 21.86 during the quarter from 16.66 and 22.20 respectively, in the previous quarter.

[7] This includes the ₦620.0 billion injection into some troubled banks in form of tier 2 capitals, as well as some other accommodative policy measures.
[8] AMCON purchased bad loans in December 2010 to the tune of ₦1,036.3 billion.

The impact of the global financial crisis was more pronounced in Nigeria in 2009 as it affects developments in the domestic economy, commodity prices fall, net capital inflows declined, trade finance and international lines of credit dried up. To this end, guarantee on interbank transactions were extended from March 2010 to December 2010 and further to June 2011. Standing deposit facility rate was reduced from 2.0 per cent to 1.0 per cent to discourage the incessant use of the window by the DMBs.

The restrictive monetary policy trust of the CBN in 2011 was to contain inflationary pressure that arose from huge fiscal expansion due to pre-election spending, the purchase of bad loans of the DMBs by AMCON and the rise in global energy and food prices yielded the desired result. The CBN reviewed MPR upward from 6.25 per cent to 6.5, 7.5 and 8.0 per cent in January, March and June, respectively. CRR was adjusted upward to 2.0 per cent in March 2011 from 1.0 per cent and further to 4.0 per cent in May 2011. Standing deposit facility was suspended in March 2011 following the introduction of reserve averaging that was designed to smooth the volatility of interbank rates. Both PLR and MLR increased to 16.75 and 23.21 per cent by the end of 2011Q4 from 15.74 and 21.86 per cent in 2010Q4, respectively. Although, credit to the private sector increased from ₦8,344.2 billion in 2010Q4 to ₦9,614.5 billion in 2011Q4. The exchange rate depreciates steadily, from ₦150.65 in the fourth quarter of 2010 to ₦156.99 in the last quarter of 2011.

The monetary policy in 2012 was designed to achieve price stability[9] in compliance with the CBN Act of 2007, hence the monetary conditions was restrictive in the first two quarters of 2012 as CBN left MPR unchanged since the beginning of the year, while PLR and MLR increased steadily from 16.75 and 23.21 per cent in January 2012 to 16.93 and 23.44 per cent in May 2012, respectively.

5.0 Conclusion, Some Practical Caveats and Policy Implication

The study applied an autoregressive distributed lag approach to an aggregate output model to estimate the weights of the variables in the broad monetary conditions index for Nigeria for the period 2004:Q1 to 2012:Q2. The result attached a higher weight to exchange rate channel, then credit channel and follow by interest rate channel, implying that exchange rate channel is more

[9] As outlined in the CBN monetary, credit, foreign trade and exchange rate policy guidelines for fiscal years 2012/2013

prevalent than the credit channel and interest rate channel in determining the level of output in Nigeria. The resultant monetary conditions index traces fairly well the policy direction of the Central Bank of Nigeria for the studied period, hence can serve as an adequate lead indicator of monetary policy stance of the CBN.

There are, however, some practical caveats that require mentioning with regards to the limitations of the MCI, particularly considering the evolving nature of monetary policy framework of emerging countries such as Nigeria. First, the weights of the components of MCI are not directly observable; hence econometric models are used to determine the weights. This makes the weights highly sensitive to the model adopted in the estimation, thereby causing the index to be vastly dependent on the model used. Thus, introduces a substantial degree of uncertainty in the process. Second and worse of all, the assumption that the relative impact of the components of MCI on either output or inflation, as the case may be, is constant over time is erroneous, especially in case of Nigeria where policy shift (otherwise known in some quotas as policy inconsistency) and structural changes in economic behaviour could often vary the relative importance of the channels of monetary transmission. Third, the choice of the base period plays a critical role in determining the monetary conditions at any particular point in time.

Despite the caveats, there are some vital policy implications of the study. One, the exchange rate channel is by far the most effective and efficient channel of monetary transmission in Nigeria since 2004. The exchange rate channel occupies the top position and followed by the credit channel. Although, the credit channel is second to exchange rate channel, the importance is far apart from the exchange rate channel. Even though, the CBN has recently placed premium on intervention in sectors considered critical to the economy (i.e. agriculture, power and aviation), through special interventions in terms of credit allocation, the fact remains that considering the weaker weight attached to the channel, the impact is likely to be minimal on the real sector. Stemming from this fact, therefore, it is obvious that the CBN should increase her effort to further deepen and liberalise both the foreign exchange and financial markets such that policy decisions with regards to exchange rate and interest rate stability and adjustment can easily pass through to the real sector of the economy.

Two, there is also the need to diversify the export base of the economy to reduce pressure on the naira. This is in consideration of the importance the result attached to the exchange rate channel. This, if done is capable of stabilising the general price level arising probably from incessant importation as compared to exports.

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