Determinants Of Financial System Liquidity (1980 – 2005): Evidence From Nigeria

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ABSTRACT

This study presents an economic model of the Nigerian financial system with a view to determining its liquidity profile using a group of money market instruments (MMIs). Results indicate that commercial papers had the greatest significant impact on bank liquidity (proxy for financial system liquidity) in Nigeria. It is also recommended that greater use of money market instruments have higher prospects of profitability expectations in order to mop up excess liquidity prevalent over the years in the Nigerian financial system. This policy action will thereby raise expected profitability and retained earnings obtainable in the Nigerian money markets and will lead to growth of the economy in the long-run through gross domestic investment (GDI).

1. INTRODUCTION

In this paper, we set out to present a mathematical model of the structure of the Nigerian financial system's liquidity as proxied by the total value of money market instruments and to carry out an econometric estimation of the model using simple time series of Nigeria's financial statistics for the period 1980 – 2005. The estimated model presented here can be used to conduct a structural analysis of the Nigerian financial system in relation to its liquidity rating, conduct macro-economic forecasting and carry out policy evaluation.

Accordingly, we shall use the model to indicate the underlying interrelationships among aggregates in the Nigerian financial system as concerns money market liquidity and profitability. We shall also assess the predictive power of the specified structural equation. Further, the comparative statistic results of the model estimation will also yield elasticities and multipliers, which can be used to carry out structural analysis, attempt forecasting, and carry out short-term policy evaluation by the method of the instrument-targets technique of Timbergen (1956) and Aneke (1999).

2. MODEL SPECIFICATION

The model of the present study can be specified as follow:

$$LR_{it} = \beta_o + \sum_{i=1}^{n} B_i X_{it} + e_t \quad (1)$$

Where;

LR_{it} is the measure of liquidity which is the ratio of total specified liquid assets (kept by commercial banks) to total current liabilities for the period 1980-2005. β_0 is the intercept of the equation. β_i is the change co-efficient for X_{it} variables. X_{it} is different independent variables for liquidity or illiquidity of the Nigerian financial system i at time t. i represents the number of the Nigerian money market instruments for liquidity or otherwise for the Nigerian financial system within the period under review i.e., i = 1, 2, 3, ….n (in this study n=6 money market instruments). t is time period i.e. t = 1, 2, 3, …. t (in this study t=26 years).

The above general least square equation with specified variables will form equation (2) thus:

$$LR = b_0 + b_1(TB_s) + b_2(TC_s) + b_3(EDS) - b_4(CD_s) - b_5(CP_s) - b_6(BA_s) + e_t \qquad (2)$$

where;

LR is the liquidity ratio (percent), TB_S denotes Treasury bills (naira values) as percent of GDP at current market prices, TC_S denotes Treasury certificates (naira values) as a percent of GDP at current market prices, EDS denotes eligible development stocks (naira values) as percent of GDP at current market prices, CD_S denotes certificate of deposits (naira values) as percent of GDP at current market prices, CP_S denotes commercial papers (naira values) as percent of GDP at current market prices, BA_S denotes Banker's acceptance (naira values) as percent of GDP at current market prices, and e_t corresponds to random error term.

Data, Sources and Limitations

Data of this study include commercial banks liquidity ratios; each of these (treasury bills, treasury certificates, eligible development stocks, certificate of deposits, commercial papers, bankers acceptances) as a percentage of GDP at current market prices.

The required secondary data to be utilized for the econometric estimation were obtained from *CBN Statistical Bulletin*, Vol. 16 (Dec. 2005), *CBN Annual Reports and Statement of Accounts*(2005),both published by the Central Bank of Nigeria, and *The Nigerian Stock Exchange FactBook* (2005) published by the Nigerian Stock Exchange.

Estimation Method

Most macroeconomic time-series data display non-stationarity and can be classified as integrated or near integrated (Olusoji, 2003). Regressing with these variables leads to the danger of non-standard distributed parameter estimates which make influence much more difficult. Usually, the first difference transformation $I(1)$ eliminates this linear trend, which makes the series stationary. Therefore, while estimating the model, we may test for the unit root characteristics of the variables and the extent to which the variables are co-

integrated if our results warrant such tests to be carried out. This will be done using the Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) (see Engel and Granger, 1987). This application will remove non-stationarity of some of the variables contained in the model to enable better results to be achieved from the study.

3. RESULTS

The results of descriptive and quantitative analysis of regression results from equation (2) are presented in Table 1 below:

Table 1. Modelling Banking System Liquidity Ratio by the OLS

Variable	Coeff.	Std Error	t-stat	Prob.
Intercept	48.35	3.80	12.72	0.00
TBs	0.00	0.00	1.06[****]	0.30
TCs	-0.00	0.00	-1.59[**]	0.13
EDS	0.00	0.00	1.22[***]	0.24
CDs	-0.00	0.01	-0.24	0.81
CPs	-0.00	0.00	-1.88[*]	0.08
BAs	-0.00	0.00	-0.64	0.53

$R^2 = 0.2985$
DW stat = 1.77
F-Stat = 1.35

*Note: *, **, ***, and **** denotes significance at 5%, 15%, 20%, and 30% levels respectively.*

Structural Analysis

Let us now briefly examine the results of our model equation estimation and analyze the explanatory variables to determine the nature of their impact on the liquidity ratio of Nigerian commercial banks.

In this estimated model, the descriptive statistic represented by R^2, F-Statistic and DW-Statistic are significant being relatively free of estimation problems. Within value DW-Stat value of 1.77, the model is free from error of multicollinearity. Qualitatively, the estimates except TCs, bear expected signs and the model is highly explanatory.

The results reveal that CPs are negatively and statistically significant (at 5 percent level, in agreement with a priori expectation. CPs, because the instrument is a medium-term one (with a longer maturity of 4 – 6 months) and with a higher interest rate than that of TBs) it can

comfortably form an alternative to short-term bank loans instead. It is relatively illiquid and as such it can be used to reduce level of excess liquidity in the financial system and thereby rise profitability (i.e. returns from investment). This is in line with the concept of *Options Principle* of Emery et al. (2007).

The results for TCs are negative and relatively significant at 15 percent level. The plausible reason for TCs assuming a negative sign is that it has a longer maturity and is riskier than TBs, as a result of inflation expectations and is illiquid. It thus will require a higher interest rate or return (Emery et al., 2007).

Hence it should not have been included among the specified liquid assets for the Nigerian banks by the Central Bank. This is so that banks' true liquidity ratings will be rightly determined by core liquidity instruments thereby leading to reduction in the value of excess liquidity experienced perennially in the Nigerian banking system.

The results for EDS are insignificant and it has a positive relationship with the dependent variable, LR. This is in line with expected economic thinking in that it is a Federal instrument easily discountable at market value and commercial banks have aggregation of specified liquid assets. The results for TBs are positive and not very significant in influencing liquidity in Nigeria according to our study. The plausible reason for its poor liquidity ratings is that TBs has been a major effective money market instrument for controlling liquidity in Nigeria ever-since. Similarly, the CDs and BAs show negative and insignificant impact on LR of the Nigerian banks in line with a priori expectation. However, as they reduce liquidity in the system they raise profitability in consideration of higher interest rates they command which depend on inflation expectations (Emery et al., 2007). Investment in them may be necessary in the Nigerian circumstance to assist mop up excess liquidity that is always persistence in the banking system.

4. CONCLUSIONS

We have observed that the predictive power of our specified equation is relatively high (R^2 of over 29.9 and DW-Stat of 1.77). The significance of the intercept is very high at 0.0000at 1 percent significant level. We have

also noted that the long-term multipliers and elasticities are employed not just in structural analysis only, but also in forecasting and policy evaluation by the instruments – target techniques.

Now, we have already used the estimates of these entities, which are derived from the model presented here, to evaluate economic and financial policy in Nigeria over the period of this study. The calculated statistics are fiscal policy multipliers which covered the period 1980-2005, 26 years. As such we can now make our policy recommendations arising from the findings of this research to document as follows:

- Government should encourage banks and other investors in the Nigerian economy to make investment in commercial paper because of its potentials for yielding high profitability. Since the Nigerian public have now gained broadened interest in investing in shares (equities) of business firms, they can equally go for CPs of star or blue chip companies. It should definitely be a recommended channel for off-loading excess liquidity of non-bank financial institutions and governments who would want to invest short-term out of their excess funds.

- Promote investments in TCs which is a money market instrument similar to CPs. It is high time TCs are put into more effective use in Nigeria than before now, since it is backed by the Federal Government. Investors can go for TCs because of its security, medium maturity period with attendant attractive rate of interest and high level of relative liquidity. Since it is government backed, it is a sure alternative investment to TBs which has been over-used as the main MMIs in Nigeria for controlling excess liquidity, inflation and money supply.

- Government should equally promote investments in eligible development stocks (EDS) for similar reasons of moderate rate of interest, ease of convertibility into cash since it is a federal paper that can easily be discounted and for the sake of diversification in the portfolio of money market assets they (Nigerian companies and government) are holding.

- TBs have constituted the major money market instruments used by the monetary authorities in Nigeria since inception of the Central Bank

of Nigeria in 1958 to control both liquidity and money supply. Its being moderately significant in this study is understandably associated to over-use. It is therefore strongly recommended that alternative MMIs should be given a prior trial most especially now that the Nigerian money and capital markets are gaining a new awareness and growth.

- Finally, Government should likewise promote investments in both CDs and BAs to maintain needed diversification in portfolio of assets among Nigerian investors ensure rise in profitability and mop up excess liquidity in the banking system.

The model presented here is significantly unique and germane to the determination of excess liquidity prevalent in the Nigerian banking system or environment and no such research or model estimation has ever been carried out in (on) Nigeria before now known to us as such making ours both timely and relevant. Our estimation results have opened the possibility of augmenting the instruments-targeting approach of Timbergen with the Samuelson multiplier-accelerator interaction model (Samuelson, 1939). Theirs have been applied to industrialized economies. So, our results provide evidence of dominance of the enclave of modern sector over emerging markets of the 21st Century economies. Indeed, in the period of our study, so much evolution and revolution have occurred in the Nigerian financial and banking systems witnessing explosion of financial liberalization which started in the wake of 1987 (Uremadu, 2006), bank recapitalization and capital market developments of the 2000s. The evolutions in the financial markets are still in progress. So much has happened and we felt time has ripped for an emergence of an empirical research that investigates what core factors have been responsible for the persistence in excess liquidity that has prevailed in the banking system over these years. No doubt the present study is timely.

Further researches are indeed beckoning for attention on the determinants of financial system's liquidity and on what core indices that cause excess liquidity in the Nigerian financial system generally. In the course of time, we might contemplate doing an extension to the present study. Expected contributions of research from such a study will help deepen growth of the Nigerian economy beyond what is now. These are our honest convictions.

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