The Demand for Money in Nigeria

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Abstract

This study examined the demand for money in Nigeria. The study used annual time series spanning 26 years on both narrow and broad money, Income interest rate, exchange rate and the stock market. The study employed the use of multiple regression analysis, the unit-root test for stationarity and CUSSUM stability test. The study found out that money demand function is stable in Nigeria for the sample period and that income is the most significant determinant of the demand for money. It was also gathered that stock market variables can improve the performance of money demand function in Nigeria. The study recommended policies aimed at improving stock market activities and also monetary targeting as a tool for inflation control.

Key words: Demand for money, Narrow Money, Broad Money, Stability Test, Unit-Root Test.

1.   Introduction

The concept of "money demand" has over the years attracted the interest of great economists.   Unlike the demand for goods it is not restricted to one market but also involves other markets (Money market, capital market commodity market and foreign exchange market), hence it has a direct bearing on monetary policy and so relevant to the study of macro-economics.   The focus on the demand for money is attributed to the fact that monetary policy will only be effective if the demand for money function is stable.   Stability of the demand for money is crucial in understanding the behaviour of critical macro-economic variables (Essien, Onwioduokit and Osho. 1996).

Why do individuals hold money?   Answering this question has attracted the interest of great economists. From Irving Fisher in the early 1900s, to John Maynard Keynes in the early 1920s and 1930s, to William Baumo, James Tobin and Milton Friedman from the 1950s and on.   Keynes (1936) had a great impact on theory of demand for money function.   He introduced a conceptual framework that fostered the development of all modern theories.   Today, Keynes is acknowledged as the father of modern theories of money demand.

Money, according to Keynes, is demanded for many purposes; transactions, precautionary and speculative. Corresponding to each purpose, there can be demand for some amount of money.   In the Keynessian tradition, the demand function for money is formulated as if there are two separate amounts of money demanded for two broad needs (Mai-Lafia. 2002).   First, transactions and financial needs for the effectuation of exchanges of goods and services by business enterprise and individuals.   Second, precautionary and speculative needs corresponding, respectively, to the desire for security to have in future cash balances equivalent to a certain proportion of total resources, and to the object of securing profits from better knowledge of the behavior of financial markets.

Friedman (1956) opined that investors can hold their wealth in the form of money, bonds, equities and commodities.   According to Friedman, wealth must be variable in the money demand function and he used permanent income, a weighted average of current and past levels of income, as an alternative in the absence of a direct estimate of wealth.   Baumol (1953) also made his contribution using his *inventor-theoretic approach* by introducing brokerage fees and the deposit rate into the money demand function.

Carpenter and Lange (2002) opined that a stable money demand function has long been sought after because it can be very useful for explaining, and even predicting the behaviour of other aspects of the macro-economy.   They further contended that, in traditional formulations, money demand is a function of

scale variable, like nominal GDP, and the opportunity cost of holding money. If; (1) the elasticity with respect to the opportunity cost is known, and (2) the relationship between money and GDP is stable, then the observation of money data, which tend to be relatively high frequency, can help to predict nominal output, which is observed at a lower frequency. According to them, while both of those conditions are important, it is the second that is most often called into question.

The search for the stable money demand function has gone on unabated and the breakdown of previously stable relationships has led to re-specification of models through out the post-war period and makes sure the search continuous (Carpenter and Lange. 2002). Attempts to demonstrate the determinants of, and stability of the demand for money function in Nigeria dates back to the early 1970s. Tomori (1972) generated a lot of debate (in what is now known as the "TATTOO DEBATE") on the subject matter and consequently led to further empirical investigations of the issue.

Mai-Lafia (2002), while examining the cost of credit (interest rate) in Nigeria pointed the fact that the interest rate dispute is related to allocation of savings between money and other financial assets. That there exists an inverse relationship between the desire to hold money and the desire to invest. Borrowers in need of credit are able to attract such funds from savers so long as they succeed in creating money-substitutes which have the effect of reducing the demand for money as a form of holding wealth. For example, when shares are substitutes for money, and increase in distributive dividends will induce a reduction in the demand for cash balances and this, in turn, will favour investment of such balances in shares. Therefore, he asserted that the substitution relationship among assets is of great help in specifying the demand for money function.

Through time, the stock market has become a more important store of wealth for households. Growth and innovations in mutual fund industry and the emergence of internet trading have reduced transaction costs and thus increased the substitutability between equities and money (Carpenter and Lange. 2002). The evolution of household portfolios was explored by Bertnut and Starr – Mc Cluer (2000). Using data from the United States, they reported that the fraction of households that own bank accounts has remained steady between 87 and 90 percent from 1983 through 1998. Wealth in mutual funds increased from about one percent of total assets in 1983 to five percent in 1998; mutual funds represents almost as large a share of households' assets as bank deposits, and direct ownership of individual stocks makes up another 10% of total assets.

Carpenter and Lange (2002) introduced two indicators of equity market conditions, the volatility in equity prices and revisions to analysts' earnings expectations, into a money demand model. Assuming that agents are risk averse, volatility in the value of an asset tends to make that asset less attractive, Ceteris Paribus, and thus could push investors into safer alternative assets. Similarly, equity prices are a function of the discounted future earnings of the company, so changes in earnings forecasts represents changes in the opportunity cost of holding money, albeit along a different dimension that the standard risk-free interest rate trade off. They found that the equity market variables are statistically and economically significant in the money demand equation (for USA) from early 90s to 2002. Their conclusion is that the inclusion of these variables tightens the estimated money demand equation.

Money demand in part reflects a portfolio decision. As equities have become a significant store of wealth, it seems plausible that variations in equity markets could affect the money demand. Carpenter and Lange (2002), re-specified a standard money demand equation to include stock market earnings projections. They found that those equity market variables are statistically significant and reduce the errors from money demand models. In Nigeria, economic reform at the turn of the 21st Century boosts confidence in the private sector by increasing the activities in that sector which invariably increase the need for enlistment of companies in the Nigerian Stock Exchange (NSE). Increased enlistment with policy of recapitalization in some sectors of the economy increased stock market activities. The increased stock market activities means stock market variables can no longer be ignored in modeling demand for money in Nigeria. Against this background, this study seeks to examine the influence of stock market in the money demand function for Nigeria. The rest of the study is organized thus; Section two is a review of related literature. Section three is methodology while section four offers data analysis and section five is summary and

conclusion.

2.   Review of related Literature

Money, generally refers to coins or paper notes and in a technical perspective includes a persons' wealth including their property.   In economics, the *liquidity approach* to the definition of money sees money in two ways; Firstly its narrow   sense as the sum of deposit and currency.   Since the demand for money is the desire to hold cash, money demand is the sum of deposit demand (D^d) and currency demand (C^{urd}), M^d = D^d + C^{urd}, hence factors affecting money demand are the same as factors affecting deposits demand plus any factors affecting currency demand.   Secondly, the *liquidity approach* sees money in a broader sense to include M_2 and M_3, but due to the low degree of liquidity of assets classified under M_3, it becomes almost impossible to include any components of M3, hence moneyness, according to them, is a matter of degree.

Keynes (1936) had a great impact on the theory of demand for money function.   Using his speculative demand for money, Keynes extended another function of money i.e., store of value property.   According to the *speculative demand*, expectations on the future price of bonds is the major factor in deciding between money and financial assets (bonds).   Anyone who thought that the value of non-money assets was likely to increase would seek to economize on the holding of money balances in order to increase the capital gains available to the holders of non-money assets.   It is this motive for varying the money balances that people hold which Keynes called the *speculative demand*.   Friedman (1956) introduced the wealth constraint into the money demand function.   According to Friedman, investors can hold their wealth in the form of money, bonds, equity shares, commodities and human wealth.   He concludes that the demand for money depends on the rates of return on these assets and upon income.

A recurring debate in the literature on the effectiveness of monetary policy to stabilize the Nigerian economy in terms of price stability and subsequently stimulating economic growth is the nature and stability of money demand function (Busary. 2006).   This debate started in the early 1970s amongst a group of scholars in Nigeria in what is popularly referred to as the "TATTOO DEBATE".   Tomori (1972) found income, interest rate and real income to be the major determinants of demand for money in Nigeria. Owing to perceived shortcomings of Tomori's work, Ajayi (1974), Teriba (1974), Ojo (1974) and Odama (1974) reacted to the findings.   The debate centered around the significance of income in money demand function for Nigeria, the stability of the function, and the choice of appropriate definition of money in Nigeria.

On the issue of income, in line with Tomori's assertion, Teriba and almost all the other scholars, agreed that income is the most significant determinant of money demand in Nigeria.   On interest rate, Teriba contrasted Tomori's view by arguing that long term interest rate is significant (unstable demand for money) but short term rates are insignificant (stable demand for money function).   Those who however, argued that the rate of interest is not significant have two reasons for their argument (Mai-Lafia. 1995).   Firstly, the interest rates have remained relatively stable in developing countries so that there is too little variation to allow conventional estimators to capture the effect of interest rates in the demand for money function. Secondly, that owing to the underdeveloped nature of the financial structure of less developed countries, the substitution between money and real assets may be quantitatively more important than that between money and financial assets.Owoye and Onafowora (2007) found income elasticity of 2.067 for Nigeria and interest elasticity of 0.306.

On the appropriate definition of money demand in Nigeria, Tomori concludes that M_1 performs better than M_2.   In contrast, Ajayi asserts that M_2 performs better than M_1.   In an attempt to mediate between Tomori and Ajayi, Gwosh (1981) contends that both M_1 and M_2 can be used as the definition of money in Nigeria. As lively as the debate was, the issue still remains inconclusive.   Several studies have been conducted around the globe on the subject matter.   Pathak (1981) looked at stability of the functions as well as the function of money as a medium of exchange.   Darat demonstrated the long run elasticities of real money demand (narrow money, M1 and broad money, (M_2).   His study showed that real income elasticities of M_1 and M_2 were greater than unity and the function was stable.

Nwaobi (2002) has also made efforts to examine the stability of the Nigeria's money demand function and

found it to be stable.   Nwaobi then suggests that monetary policy could be effective and that income is an appropriate determinant in the estimation of money demand in Nigeria.   Anoruo (2002) explores the stability of M_2 money demand function in Nigeria during the Structural Adjustment Programme (SAP) period.   He observed that M_2 money demand function in Nigeria is stable for the study period.   Again, like Nwaobi, he asserts – using M_2 money demand function, that it is a viable monetary policy tool that could be used to stimulate economic activity in Nigeria. This study concurs with Nwaobi that income is an important variable in the demand for money in Nigeria and that interest rate is insignificant in the function making it stable.

One major issue that has influenced money demand in Nigeria is the introduction of economic reforms. Since the economic reform measures started, several studies have been carried out on the demand for money in Nigeria, though not all made explicit attempts at investigating the stability of money demand function.   Asogu and Mordi (1987) examined the monetary sector in general to discover some major determinants of money demand function.   Ikhide and Fajingbesi (1998) also examined interest rate deregulation in Nigeria to see whether it is of major significance in the money demand function in Nigeria. Essien, Onwioduokit and Osho (1996), in their work on the demand for money in a debt-constraint economy observed that indebtedness could signal to private economic agents the direction of government fiscal and monetary policy which in turn influences the demand for money in the domestic economy. Audu (1988) in a research on selected West African countries observed that for Nigeria, a stable money demand relationship exists.

There is an inverse relationship between the desire to hold money and desire to invest (Mai-Lafia. 1995). Borrowers are in need of credit and so they create money substitutes which have the effect of reducing the demand for money as a form of holding wealth.   He (Mai-Lafia) used shares as an example and stated that if they are close money substitutes, an increase in distributed dividends will induce a reduction in the demand for cash balances and this will in turn favour investment of such excess in shares.   Lee (1967) asserts that the demand for money is mostly sensitive to changes in the yield of savings and loan shares. Hamburger (1966) suggest that he is enabled to reject the hypothesis that equities and financial assets – including short and long term marketable bonds and the liabilities of financial intermediaries are equally effective substitutes for money. We concur with Mai-Lafia, Lee and Hamburger that the higher the yield on other financial assets, individuals deplete their stock of cash and instead hold those assets.

Conceptually, money is an asset with a particular set of characteristics, most notably its liquidity (Carpenter and Lange. 2002).   Like other financial assets, demand for money is part of a portfolio allocation decision, in which an agent's wealth is distributed among competing assets based on each asset's relative benefits (Tobin 1969).   To a certain extent, agents are willing to give up the higher return of alternative assets in order to receive the benefit of liquidity that money provides.   Thus, according to Carpenter and Lange (2002), standard money demand equations include an interest rate or interest rate spread to measure the opportunity cost of holding non-interest earning money. This is true in the sense that since opportunity cost is the cost of alternative foregone, a higher return on alternative assets depletes liquidity (cash holding).

The historically higher return in the equities market is usually explained as a premium in exchange for the risk of holding these assets.   In most portfolio theory, assets are balanced in terms of risk versus reward (Carpenter and Lange. 2002).   Because monetary assets tend to be essentially riskless (ignoring inflation risk) they assert that the risk of a substitute asset ought to have a significant impact on the relative share of the portfolio allocated to money, assuming a risk averse agent.   A greater riskiness in equities, that is higher volatility, should be expected to induce a greater demand for money.   That is to say, if the volatility in the stock market were to permanently rise, all other things equal, one would expect the equilibrium level of money balances to rise as well as portfolio were adjusted away from the riskier asset.   In the same vane, they assert that a greater expected return in a competing asset should reduce the demand for money, implying a negative relationship.   In their work, they (Carpenter and Lange) concluded that a standard money demand model can be improved by including equity market variables.

3.Methodology

Keynes (1936) suggested three motives for holding money; Transactionary, Precautionary and Speculative

motive. The transactionay and precautionary motive are a function of income while using his speculative demand, Keynes extended another function of money i.e the store of value. For the rate of return which defines the speculative motive, we specify

$M^d = F (Y_2 r)$ …….…………………………………………………… (4.3)

$(\Delta \text{ in } M^d / \Delta \text{ in } Y) > 0$

While

$(\Delta \text{ in } M^d / \Delta \text{ in } Y) < 0$

This means that a positive relationship exist between the demand for money and income while an inverse relationship exist between the demand for money and interest rate.

Friedman(1956) made a case for the inclusion of a variable that represents price level in modeling the demand for money. Teriba (1992) include inflation rate in his model and the empirical result justified its inclusion. In the light of this, the above model (4.3) would be extended to include inflation. Thus;

$M^d = F (Y, r, INFR)$ ………..……………..………………………… (4.4)

Furthermore, in an open economy, the external sector should not be ignored. In the light of this, Essien, Onwioduokit and Osho (1996) contended that the return on the holdings of foreign assets will be influenced by the expectations of exchange rate movements. They wrote that attempts should be made to capture the influence of exchange rate expectation on the return of foreign assets. Elbadawi (1992), as cited in Essien, Onwioduakit and Osho (1996|) suggested that the influence of the rate of change of parallel market exchange rate or its premium on the holdings of domestic currency vis- à-vis holdings of foreign exchange or other forms of durable assets could be strong enough to validate the use of the parallel market rate as the true opportunity cost variable. The introduction of the exchange rate into the demand for money function yields the following;

$M^d = F (y,r, INFR,ER)$ ………………………………….……………… (4.5)

Carpenter and Lange (2002) specified a standard demand for money equation to include stock market earning projection as demand for money in part, reflects a portfolio decision. As equities have become a significant store of wealth, it seems plausible that variations in equity markets could affect the demand for money. They asserted that a greater expected return in a competing asset should reduce the demand for money, implying a negative relationship. In their work, they concluded that a standard demand for money model can be improved by including equity market variables. In the light of their assertion, the demand for money function could be restated as follows:

$M^d = F (y,r, INFR,ER,DIVY)$ ………………..………………….……………… (4.6)

In conclusion, the nature of the relationship between demand for money and its determinants can be stated in specific terms by indicting the mathematical form of the model.

$M^d = bo + b_1 RGDP – b_2 MPR – b_3 INFR = b_4 ERD – b_5 DIVY + u$ …..(4.7)

Where

M^d = The demand for money (M_1 and M_2)

RGDP = Real GDP Growth rate

MPR = Monetary Policy rate

INFER = Inflation Rate

ERD = Exchange rate Depreciation

DIVY = Average Dividend

The return on the holdings of Foreign assets will be influenced by expectations of exchange rate movements (Essien, Onwioduokit and Osho 1996). They said further that the depreciation of the domestic

currencies would lead to a rise in the return on foreign assets to domestic holders and vice versa. Accordingly, attempt should be made to capture the influence of exchange rate expectations on the return on foreign assets. That this could be done by either adjusting the foreign interest rate for exchange rate expectations or by introducing the exchange rate as a separate variable in the demand for money function. They however used exchange rate rather than foreign interest rate as a measure of foreign currency substitution in the Nigerian economy. This is however adopted in this work as we use the official exchange rate depreciation as a separate variable in the model.

A model of the demand for real money balances would revolve around finding a stable function (in the face of expanding stock market) establishing a stable relationship between the demand for money and the factors influencing them. The econometric tools to be used for the analysis of the data are a multiple regression technique and the unit roots/COMMSUM tests. This is to investigate the effect of the return on equities (Dividend yield), the stability of the demand for money function with respect to interest rate, the effect of inflation rate and exchange rate and then whether income still remains the most significant determinant of the demand for money in Nigeria and also the stability of money demand function.

The study will use secondary data for a period of 26 years, from 1985 – 2009. For reference purposes, the source of the data will be mainly government publications from the CBN Statistical Bulletin, Federal Office of Statistics (FOS) AND National Planning Commission. In addition, data will be sourced from the internet and others such as newspapers, magazines and other unpublished research works.

The null hypothesis of the presence of unit root of each of the variables are tested against the alternative hypothesis of the absence of unit root (presented in table 2-see apendix). The result shows that the null hypothesis of the presence of unit root is accepted at the 5% level(except for exchange rate). So also, the nulls that their first differences have unit roots are rejected. The study therefore concludes that the level variables are non-stationary and that their first differences are stationary.

4. Data Analysis and Interpretation

This chapter is an empirical appraisal of the demand for money in Nigeria. Narrow and board money (M_1 and M_2) are used to capture the demand for money in Nigeria. Scale variable i.e real GDP growth rates is used for income and the other driving variables include the monetary policy rate, inflation rate, exchange rate and the dividend yield. We used data for Nigeria which cover the period 1985-2007. We employ the use of the unit root and CUMMSUM tests on the annual data for the period.

4.1 *Estimation Result and Interpretation*

We employ the use of regression analysis and also used the Ordinary Least Square approach on annual data for the period 1985-2007. We used the economic criterion which is based on the theoretical expectation about signs and magnitudes of the parameters, the statistic criteria and the econometric criteria. Below is the summary of the estimated results.

4.1.1 Stability Test

The stability of the parameters of M1 and M2 money demand equations are reported in figure 3 & 4 below(Appendix). The CUSUM test was employed to determine the stability of the parameters of money demand.

From the stability test, the result is largely stable for the sample period except for for the period 2000 to 2003 for M1 where there was a break out and 1993 for M2 which touched the boundary. Apart from that, it lies within the boundary and an inspection of the two extreme points show greater possibility of stability in periods succeeding the sample period. This is indicative of future stability.

4.1.2 Discussion of finding

The estimated narrow and broad money demand functions are reproduced below for easy comparison.

$$M_1 = -0.68 - 2.03 \text{ RGDP} - 0.68 \text{ MPR} - 0.07\text{INFR} + 0.03\text{ERD} - 0.57\text{DIVY}$$

$$(4.26) \quad (1.0) \quad (1.05) \quad (0.15) \quad (0.04) \quad (2.29)$$

$$M_2 = -1.52 + 2.44RGDP - 0.54MPR - 0.19INFR + 0.06ERD - 2.26DIVY$$

      (3.27)   (0.91)   (0.89)   (0.20)   (0.02)   (1.99)

The results show a relationship between real money balances and output, interest rate, inflation, exchange rate depreciation and dividend yield. The relationships and the sizes of the estimated coefficients indicate the following:

Firstly, money's elasticity with respect to income is in line with the economic criteria. for broad money but narrow money came out with the wrong sign. According to Keynes (1936), there exists a positive relationship between the demand for money and income. The relationship though not statistically significant for narrow money but statically significant for broad money, with broad money having a higher income elasticity than the narrow money. Such differences have been found in literature e.g Hagan (2006), found stronger real broad money response to real output than the real narrow money response for the Asean countries. The demand for real broad money depends on the desire of agents to hold money as an asset, in addition to holding it for transactions purposes. Since we know that income is concentrated in few hands in Nigeria, and wealthy people accumulate more assets, we would expect the elasticity of broad money to real output to be higher than that of narrow money. Finally, the results obtained demonstrate that income is not the most significant determinant of money in Nigeria.

Monetary Policy Rate came out with the expected sign even though statistically   insignificant for both narrow and broad money. This (insignificance) is mainly attributed to the fact that interest rate works through the financial system and with the underdeveloped nature of our financial system, the effectiveness of interest rate as a monetary policy instrument is challenged. With a narrow financial system, most agents hardly take notice of it when it changes. The interest elasticity of money is smaller compared to income for both narrow and broad money.

Furthermore, we found out that the demand for money elasticity with respect to inflation is higher for broad money than narrow money. Again, it is negatively signed for both models conforming with the expectation that inflationary tendencies deplete the value of money thereby reducing the desire to hold cash. For both narrow and broad money, the coefficient of elasticity is insignificant. This may be due to the fact that incomes are at subsistence level hence individuals need to hold cash to finance daily transactions even when inflation expectations are high.

So also, for exchange rate depreciation, the elasticity is quite low and insignificant for narrow money but significant for broad money. This demonstrates that excessive speculation in the foreign exchange market is quite low amongst the general populace. It has been an activity of a few wealthy people and the banks hence not surprising that broad money performs better than narrow money.

Finally, the last variable is the dividend yield. The elasticity for the dividend yield is negative but not significant, for both M_1 and M_2. The elasticity for M_1 is lower than M_2 signifying that for most of the period mostly wealthy individuals and corporate institutions had done investing in the stock market. The insignificance is attributed to the fact that not long ago, the stock market grew into a significant store of wealth for most people who follow daily market movements. The growing market capitalization is a pointer to this fact disregarding the current bearish period on the market, which most analysts see as a lull.

4.1.3 Policy Implication

The implications of the empirical evidence obtained in this paper are quite expected but not in all cases. Income   is the most significant determinant of the demand for money . Therefore, any policy aimed at changing the level of income will influence the demand for money in the same direction. If policy makers aimed at moping liquidity, the authorities should implement policies that will reduce disposable income in the economy.

Again, the empirical finding with respect to the interest rate, proxied by the monetary Policy Rate, calls for policies aimed at developing the financial system, increasing its depth and reaches within the economy. A highly developed financial system increase competition and awareness about the level and changes in interest rate thereby making it an effective tool of policy. This is imperative against the background of the

fact that the demand for money is stable with respect to interest rate hence stability suggests effectiveness of monetary policy in Nigeria.

Furthermore, the finding with respect to other opportunity cost variables i.e inflation and exchange rate depreciation calls for sound policies on foreign exchange transactions to stabilize exchange rate and the consideration of monetary targeting as a tool for the control of inflation. The maintenance of good level of foreign reserve will go a long way in stabilizing the exchange rate. Monetary targeting which was among the complementary policies in the suspended "Agenda for the Naira" will be an effective tool for the control of inflationary pressures in Nigeria.

The finding with respect to the stock market variable (dividend yield) calls for policy strategies aimed at mitigating the shocks or negative impact on the stock market. With the elasticity of the stock market being one of the highest(broad money), changes in the dividend yield affect the demand for money in Nigeria.

5.   Summary and Conclusion

The objective of this research was to ascertain empirically the impact of the expanding stock market on the demand for money in Nigeria, the stability of the demand function, the influence of inflation and exchange rate and whether income still remains the most significant determinant of demand for money in Nigeria. Data used covered the sample period of 23 years (1985-2007). Our major target was the stock market but we had to identify all those there variable considered to work in unison with the stock market variable to influence the demand for money in Nigeria.

The results obtained were quite satisfactory in the sense that most of the variables conform to apriori expectation about their signs. Income turnout to be positive and significant while interest rate proceed by the Monetary Policy Rate came out with the right sign (negative) but not statistically significant in both narrow and broad money. Other variables in the specification, inflation and exchange rate were also not significant except for exchange rate in broad money with exchange rate turning up with a positive sign. For the stock market variable (dividend yield), the result turn out negative conforming with apriori expectations and even though statistically insignificant, it came out with almost the highest coefficient of elasticity for broad money.

The weak coefficient of determination (R^2) for both models of narrow and broad money suggests a weak relationship between money balances and the variables in the specification, based on the data and sample period. This result shows that broad money is a better measure of money demand in Nigeria given the variables captured, data and the sample period.

This study is of the view that the empirical evidence obtained provides some useful insights into the components of the demand for money function in Nigeria. Policy makers in the country can fruitfully tinker with if the objective of monetary policy is to be achieved. Accordingly, this research may be considered a major contribution to the expanding literature on the empirical modeling of the demand for money in Nigeria.

Finally, the empirical evidence implies, also, that the monetary authorities in Nigeria should introduce the right monetary policy together with an improved fiscal discipline. This implies policies towards redistributing income, financial development, exchange rate stability and a stable and growing stock market. The down turn in the Nigerian stock market (2nd and 3rd quarter of 2008) should be tackled and seriously mitigated against towards ensuring a stable stock market which influences the demand for money, on which the effectiveness of monetary policy depends.

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APPENDIX

Table1: Money supply growth rates (m1 and M2) Real GDP Growth Rate, Monetary Policy Rate, Inflation Rate, Exchange Rate Depreciation and Average Dividend yield in Nigeria 1985-2007

YEAR	Y1(M1 Growth)	Y2(M2 Growth)	X1(Real GDP Growth Rate	X2(MPR)	X3(Inflation Rate)	X4(Exchange Rate Depr	X5(Average Dividend Yield
1985	8.71	10.26	9.3	10	5.5	16.85	10.6
1986	-1.2	3.2	3.69	10	5.4	126.07	9.9
1987	41.9	22	0.55	12.75	10.2	98.85	11.2
1988	21.5	42.6	9.18	12.75	38.3	12.91	10.7
1989	44.9	8	7	18.5	40.9	62.93	11.7
1990	32.6	40.4	10.98	18.5	7.5	8.74	12
1991	52.6	32.7	2.16	14.5	13	23.29	10.4
1992	54.6	49.2	2.95	17.5	44.5	74.56	7
1993	45.9	52.8	2.66	26	57.2	27.47	6.5
1994	45.9	35.9	1.34	13.5	57.5	-0.75	8.4
1995	16.3	19.4	2.12	13.5	72.8	0	7.9
1996	14.5	16.8	3.42	13.5	29.3	0	9.6
1997	18.2	16.9	3.16	13.5	8.5	0	8.7
1998	17.2	21.2	3.22	14.31	10	0	6.6
1999	18	31.6	2.77	18	6.6	323.53	7.8
2000	62.2	48.1	3.9	13.5	6.9	10.15	7.5
2001	40.2	34	4.22	14.31	18.9	9.64	7.3
2002	15.9	21.3	4.09	19	12.9	8.06	10.8
2003	15.7	24.1	3.78	15.75	14	6.93	10.5
2004	8.6	14	6.5	15	15	3.2	9.7
2005	15.9	16.2	6.2	13	17.9	-1.38	9.5
2006	20.3	30.6	5.6	10	8.5	-2.29	9.7
2007	25.4	40	6.5	9.5	6.6	-2.3	10.5
2008	27.6	32.88	4.93	13.05	12.44	37.37	5.29
2009	28.44	30.35	4.63	14.24	16.18	35.86	4.43

Source 1.CBN Annual Report and Statement of Account (Various Issues)

2.   CBN Statistical Bulletin

3.   Nigerian Stock Exchange Bulletin

4.   Securities and Exchange Commission Databank

5. The Nigerian Financial Standard

The variables used in the model are income, interest rate, inflation rate, exchange rate and the dividend yield. These variables are measured as follows: money is measured by both narrow money (M1) and broad money (M2). This is due to the fact that we are interested in estimating the narrow demand for money function where the transaction role of money is predominant and the broad money demand function that extends the role of money to that of an asset. The study considered the growth rate of both narrow money (M1) and broad money (M2). This is to determine the rate at which money grows in the Nigerian economy as opposed to other financial assets.

Again, income is measured by real GDP growth rate (Scale variable). This is gotten by deflating the current GDP by 1984 prices to determine GDP at 1984 prices (from CBN statistical bulletin 2006). The choice of 1984 is timely as our study period starts from 1985 – 2007. From the GDP at 1984 prices, the growth rate is the percentage increase in GDP at 1984 prices, which is the real GDP growth rate for the study period. We opted for the GDP instead of the GNP because GNP is expenditure based – even though the two move together.

Furthermore, the interest rate is measured by the Monetary Policy rate (MPR). The monetary Policy Rate which was formally the Minimum Rediscount Rate (MRR) serves as the benchmark of all other rates in the economy. It is the discount rate by the monetary authorities, and virtually all other rates within the economy are a reflection of the MPR.

Again, the exchange rate is proxied by the change in US dollar/Naira exchange rate which we refer to as exchange rate depreciation. As can be seen from the data, the highest exchange rate depreciation was in 1986 and 1999. The first period (1986) heralded the implementation of the Structural Adjustment program (SAP) while the later (1999) witnessed the enthronement of democracy with the president adopting pro-liberal policies which are market driven. This had the effect of depreciating the Naira by over 300%.

Finally, the major task of this study is to determine whether the growing stock market has actually impacted on the demand for money. Stock market is proxied by Average Dividend yield on the Nigerian stock market. Investors look at dividend returns from companies and any expectation of a high yield on equities attract investors' interest. In order to capture the overall impact of dividend on the demand for money, the average dividend yield is appropriate. To further make the inclusion of this variable suitable is the time span which covered a period of 23 years, a period that saw the implementation of major market based policies (SAP, Recapitalization Trade, Deregulation etc). The private sector driven policies impacted on the stock market over time.

Table2: **Individual** **Unit** **root**
Test

Variables	Level of stationarity	0.05 Level of significance
REAL GROSS DOMESTIC PRODUCT	$I(1)$ -5.28	-1.96
MPR	$I(1)$ -5.43	-1.96
INFL	$I(1)$ - 4.41	-1.96
AVERAGE DIVIDEND YIELD	$I(1)$ - 3.59	-1.96
M1	$I(1)$ - 3.95	-1.96
M2	$I(1)$ - 3.99	-1.96
EXCHANGE RATE	$I(0)$ - 2.88	-1.96

Table 3: Narrow Money (M_1)

Dependent Variable: D(Y1_M1_01)

Method: Least Squares

Date: 09/18/11   Time: 19:41

Sample(adjusted): 1986 2009

Included observations: 24 after adjusting endpoints

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X1_REAL_GDP_GROW)	-2.03528893025	1.00913582522	-2.01686322037	0.0588778770202
D(X2_MPR_01)	-0.68678638172	1.0504736097	-0.653787373028	0.521514304992
D(X3_INFLATION_RAT)	-0.0749485013152	0.156662717794	-0.47840674776	0.638119973997
X4_EXCHANGE_RATE	0.031137653323	0.0405590421927	0.767711751551	0.452612484049
D(X5_AVERAGE_DIVID)	-0.575670910563	2.29790276666	-0.250520134671	0.805022328516
C	-0.686711556796	4.26570102855	-0.160984455357	0.873898686852

R-squared	0.18582376495	Mean dependent var		0.822083333333
Adjusted R-squared	-0.0403363003415	S.D. dependent var		18.1919881981
S.E. of regression	18.5552599027	Akaike info criterion		8.89170153068
Sum squared resid	6197.35806103	Schwarz criterion		9.18621498827
Log likelihood	-100.700418368	F-statistic		0.821647114006
Durbin-Watson stat	2.39476673812	Prob(F-statistic)		0.550242253793

Table 4: Broad Money M2

Dependent Variable: D(Y2_M2_01)

Method: Least Squares

Date: 09/18/11   Time: 19:46

Sample(adjusted): 1986 2009

Included observations: 24 after adjusting endpoints

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X1_REAL_GDP_GROW)	2.44871822392	0.912584533003	2.68327824477	0.0151808984521
D(X2_MPR_01)	-0.549047610448	0.894451240313	-0.613837385094	0.547002907979

D(X3_INFLATION_RAT)	-0.19512949281	0.202402502845	-0.964066600301	0.347786819649
X4_EXCHANGE_RATE	0.0678998122958	0.0250321147627	2.71250802976	0.0142673613128
D(X5_AVERAGE_DIVID)	-2.2620150019	1.99758275004	-1.13237611901	0.272336091603
C	-1.52524365191	3.27575825569	-0.465615449266	0.647075067824

R-squared	0.29054770177	Mean dependent var	0.837083333333
Adjusted R-squared	0.0934776189282	S.D. dependent var	15.0266168136
S.E. of regression	14.3070625947	Akaike info criterion	8.37170153371
Sum squared resid	3684.45672159	Schwarz criterion	8.6662149913
Log likelihood	-94.4604184046	F-statistic	1.47433693425
Durbin-Watson stat	2.03734927911	Prob(F-statistic)	0.246893542181

FIG 1 M1 AND ITS DETERMINANTS

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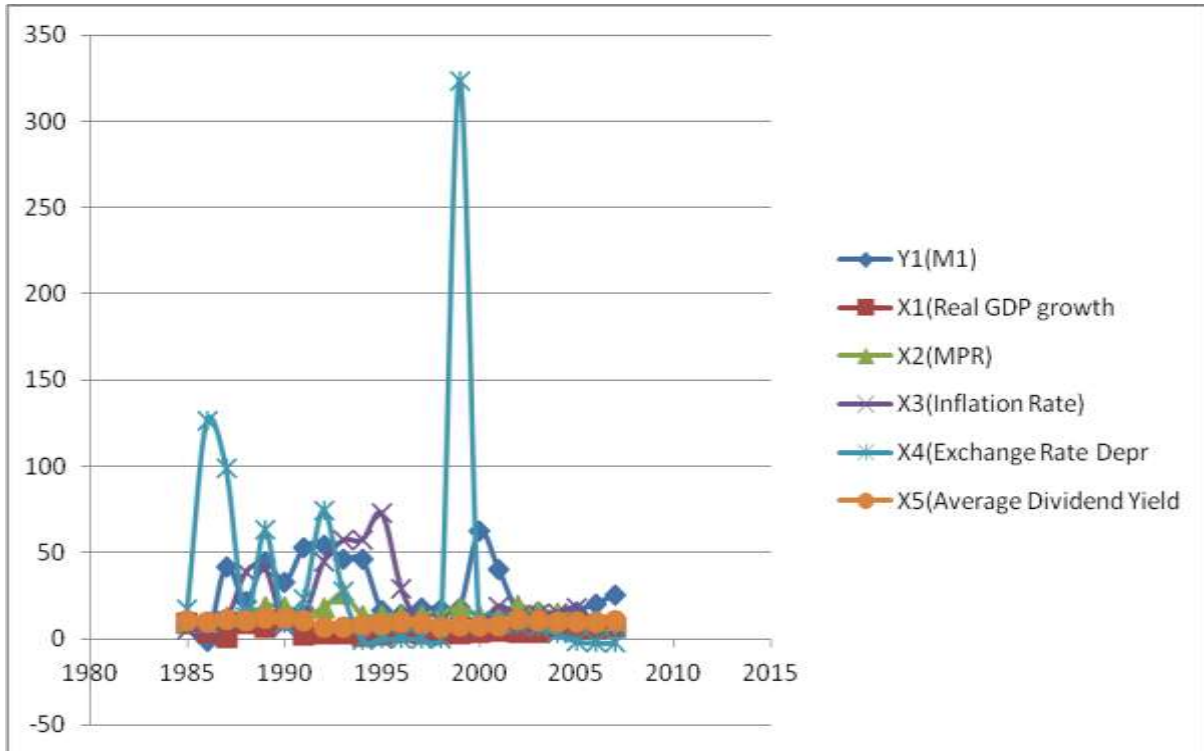
FIG 2: M2 AND ITS DETERMINANTS

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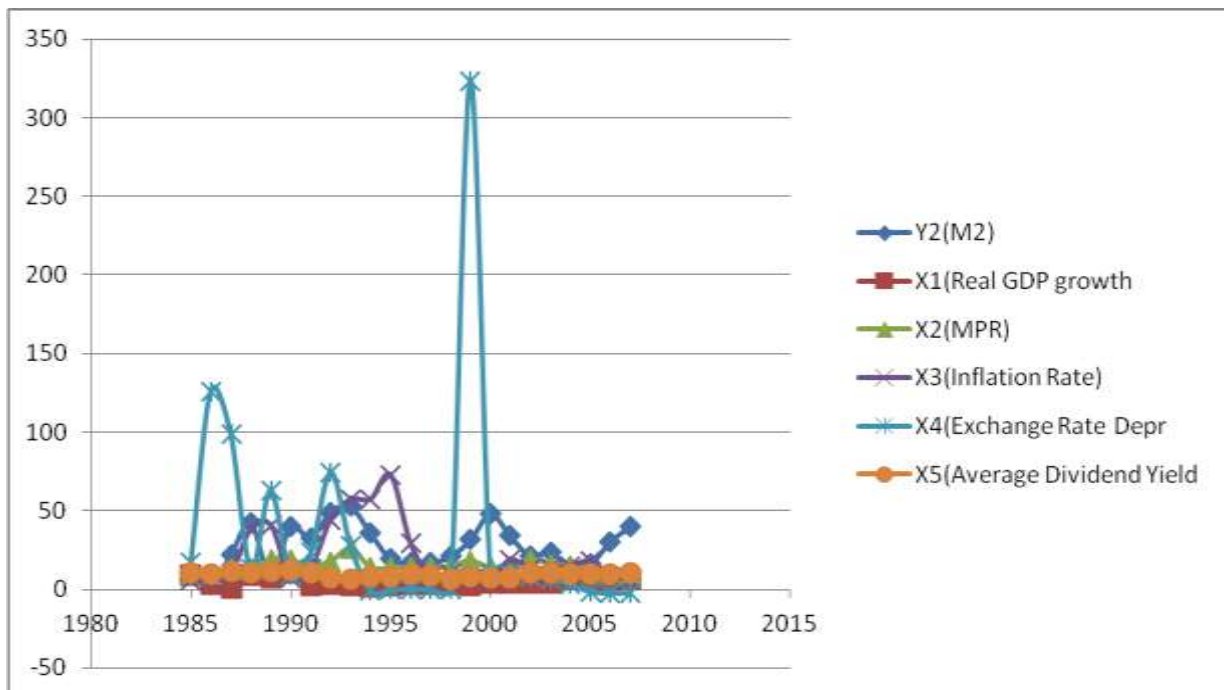
FIG 3: STABILITY OF M1
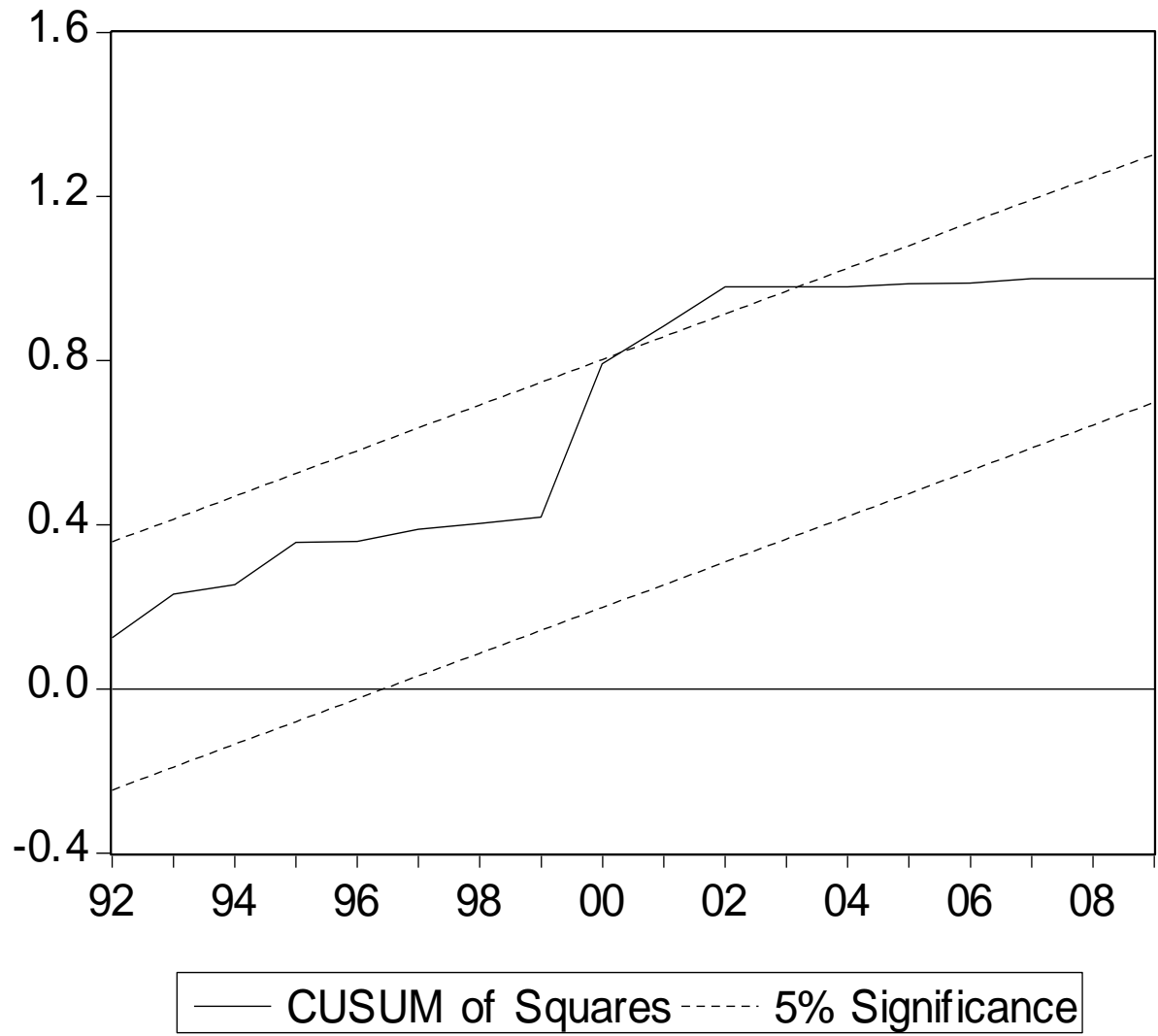
FIG.4: STABILITY OF M2

Fig 6: PREDICTED M1

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FIG 7: PREDICTED M2