The Lending Channel of Monetary Policy Transmission in Nigeria; Vector Autoregressive (VAR) Verification

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The Lending Channel of Monetary Policy Transmission in Nigeria; Vector Autoregressive (VAR) Verification

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Using the standard Cholesky decomposition, preliminary evidence shows that the price of bank loans rises contemporaneously with an unexpected monetary policy tightening. Also, the quantity of loans made by deposit money banks falls, in response to the same policy shock, though with a lag, and the point estimates are statistically significant. There is, therefore, a confirmation that the lending channel exists in Nigeria. Thus, an increase in the MRR causes a contraction in banks' credit to the economy. However, the GDP does not respond appropriately, evidencing the weak nature of the link between monetary policy actions and the real sector of the economy.

I. Introduction

Following the recent drive for the consolidation of the financial system, public interest in monetary policy in Nigeria has heightened. Stakeholders in the economy want to establish in clear terms, the exact impact of monetary policy action on the development of the real sector in particular and the overall growth in aggregate output. However, the specific direction and size of the impact of monetary policy actions on the real sector of any economy are not known with precision.

The lending channel of monetary policy transmission proposes that changes in the quanta and the associated prices of loans made by deposit money banks could be used as a measure of the impact of monetary policy in the economy. Specifically, proponents of this school of thought argue that an increase in the policy interest rate (tight monetary policy stance) will lead to a fall in the quantity of loans made by commercial banks (even when

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there are perfectly good loans to make) and a rise in the price of loans which, ceteris paribus, will lead to a fall in investment and consequently cause the volume of aggregate output to decline.

The reforms embarked upon by the Central bank of Nigeria are aimed at strengthening the financial system. The impetus for the reforms follows from the understanding that a sound financial system will render monetary policy more effective and also support growth in the real sector of the economy. This perception that the existence of sound banks will help to effectuate monetary policy therefore, must be a consequence of the conviction that there exists a definite link between monetary policy action and the lending behaviour of the deposit money banks. However, as in other stabilizing economies, the functional relations among the variables that convey monetary policy impulses through the banks to the real sector are multi-dimensional. For instance, the Central Bank of Nigeria uses the minimum rediscount rate (MRR)[1] as its anchor rate for all other interest rates in the economy. Thus, when monetary tightening is desired the Bank increases the MRR with the anticipation that all other interest rates will follow in the same direction. However, a close scrutiny of the use of the MRR as an anchor rate reveal that deposit rates in the short end of the market fall contemporaneously with the decrease in MRR, but the same cannot be said of the lending rates. Therefore, the quest to identify the perfect form of the transmission mechanism of monetary policy for various economies is a continuous one.

Generally, deposit money banks play a major role in the provision of funding for the private sector. Some empirical findings show that the ratio of bank loans to total credit of non-financial firms for Germany, France, Italy and Spain are 85 per cent, 80 per cent, 95 per cent and 77 per cent, respectively. The figure for US is 30 per cent. In Nigeria where the 'bonds' market is underdeveloped, the preeminence of banks in the intermediation process is almost total. Edo (1997) confirms the near total dominance of banks in financial intermediation when he reported that the contribution of the capital market to private sector funding in Nigeria is insignificant. As in

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[1] *The MRR is equivalent to the Fed fund rate in the United States of America and the overnight call rate in Japan*

other economic jurisdictions, banks in Nigeria, commit a substantial quantum of their total deposit liabilities to loans. At 41.2 per cent, between 1970 and 2000, the loan-deposit-ratio of commercial banks was lowest in the first quarter of 2000 and highest at 85 per cent in 1982.

The major impact of banks on the real sector could be gauged, roughly, by the quantity and quality of loans and advances to the sector. Anecdotal evidence suggests that, in a liberalized financial system, a consistent increase in the quantity of loans made by the commercial banks to any sector of the economy could be interpreted to mean that banks have stable and secure returns to their investments in the sector. In order words, the marginal productivity of capital in the preferred sector of interest must be positive. However, this observation may not necessarily hold when the performance of a loan can only be enhanced with an increase in the loan stock[2]. Therefore, the increase in the quantity of loans made to the sector would not be driven by the current stream of returns to investments. Evaluating the lending channel of monetary policy transmission mechanism in Nigeria will enable an understanding of the independent roles which banks play in the economy.

The objective of this paper is to ascertain whether the lending channel of monetary transmission mechanism exists in Nigeria.. The rest of the paper is organized in the following order. Section 2 presents review of literature and examines some conceptual issues, Section 3 discusses the data, methodology and states the hypothesis, while Section 4 analyses the results and extracts policy issues. The paper ends with conclusion in Section 5.

II.   Review of Literature

II.1   Issues in Monetary Transmission

The main objective of all theories of monetary transmission is the analysis and description of the long, indirect, and complex relationship between monetary policy actions of a central bank and their effects on the final

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[2] *A loan could be under-performing because the amount falls short of the requirement of the enterprise. Therefore, an increase in the loan amount would be required.*

targets of macroeconomic policy (Bofinger 2001). Specifically, studies of monetary policy transmission mechanism would focus on the direction and/or magnitude of the impacts of a monetary policy action on aggregate output and price levels.

The understanding of the exact process of monetary transmission is a daunting task. Blinder (1998) in support of this view alludes to the lack of consensus among economists on the appropriate econometric model to be applied and the long and variable lags associated with tracking the transmission process. Friedman and Schwartz (1963) argued that when the authorities are pursuing a restrictive monetary policy, there is an average lag of 12 months, with a fluctuation range of 6 to 29 months and when they are pursuing an expansionary policy, there is an average lag of 18 months with a fluctuation range of 4 to 12 months.

The problem with determining the 'right' transmission mechanism is made more complicated in developing economies where structural and behavioural changes are regular features of the financial system. However, the concerns notwithstanding, the potency of monetary policy has been established in Japan (Suzuki 2004) and other economies, so that there cannot be any denying the certain link that exists between monetary policy actions and the wider economy..

Several channels of monetary transmission exist. However, the interest rate component has featured prominently in leading textbooks and theoretical studies. The emphasis on the interest rate channel arose from the recommendation of the Radcliffe report in the United States of America, which recommended that those deciding monetary policy should regard the structure of interest rates rather than some notion of the 'supply of money' as the centre piece of monetary action. The interest rate channel is exposed in the marginal efficiency of capital function which posits an inverse relationship between the real interest rate and the present value of capital and consumer durable goods. The implication here is that a reduction in the real interest rate will lead to an increase in the present value of capital and durable consumer goods and increase the Tobin's q[3].

Impetus, therefore, will be given the growth in aggregate demand through the application of the multiplier to the now increased production of durable goods. The assumption underlying the above process is a low inflation regime. There is evidence in the literature that monetary policy does not only affect the interest rate but also the external finance premium. This brings to light the notion of credit channel of monetary transmission mechanism. The credit channel is merely an amplifying mechanism and not independent of the interest rate channel (Bemanke and Gertler (1995).

The main focus of the lending view is on banks and this is consistent with the finding that banks are the principle conveyors of monetary policy impulses to the real sectors of the economy. The lending channel of the transmission mechanism is a subset of the credit channel and works through the instrumentality of bank loan-supply. The major tenet of the process is embedded in the proposition that monetary tightening by authorities will increase the cost at which reserves are made available to deposit money banks by the central bank. The increased cost would consequently reduce the volume of reserves which DMBs hold at any point in time. With the reduced volume of reserves, DMBs are forced to reduce the quantity of loans which they advance to their customers. The reduced lending would lead to a fall in the level of investments thereby leading to a fall in the aggregate level of output and a rise in the rate of unemployment. The argument is hinged strongly on the assumption that capital market imperfections do not allow banks to switch, without friction, from their dependence on reserves with the central bank to alternative sources of raising funds in the wake of monetary tightening. A corollary to this in the non-financial firms states that firms that have their loan sourcing potentials eroded by high interest rates tend to look elsewhere but usually with adjustment costs (the balance sheet view). Pioneer advocates (Bernanke and Blinders 1992) of the lending channel have traced the impact of monetary tightening to include an immediate drop in bank deposits and their holding of securities, a lagged fall in bank loans, while measures of aggregate output respond to monetary impulses with a similar lag, thus declining roughly contemporaneously with bank loans.
 The lending channel was developed to address the limitations of the

[3] *Tobin's q is the Quotient: market value over asset value.*

traditional money view. The traditional view, typified by the IS-LM framework is modeled using three variables, money, bonds and reserves that banks hold with the central bank (Bofinger 2001). The implication of this trivariate model is that the role of banks in the transmission process is extremely insignificant. According to Kashyap (1997), banks do nothing unique on the asset side of their balance sheets -like the household sector, they too invest in bonds. The other shortcoming of the money view is that the central banks' (minimum) rediscount rates are neglected making the rate on bonds the only cost of all credits in the system. Also, the assumption of sticky prices renders changes in nominal interest rates identical to real interest rates. The money view, therefore, presents an over simplification of the transmission process in an economy with complexities in the financial system. The lending channel is a variant of multivariate techniques for measuring the transmission mechanism which were proposed by Brainard (1964) and others. Summarily, the model represents the money view with bank loans included as a variable. A major assumption of the model is that alternative sources of funding cannot be perfectly substituted for one another. The major advantage of this view over the traditional view is the admission of multiple interest rates in the model

Since the interest on the lending view, several studies have been conducted with intriguing findings and controversies. Some authors have argued that the notion of the central bank altering the loan supply behaviour of banks by just tampering with their reserves is not plausible. Romer and Romer (1989) suggest that banks can easily and without friction substitute their sources of funds such that their loan supply function is effectively insulated from monetary policy tightening.

Bernanke and Blinders (1992) seeking to verify the lending channel estimated their model using US data between 1959 and 1978. The included variables were Fed fund rate, unemployment rate, consumer price index, bank deposits, loans and securities. They found that monetary contraction (increase in Fed fund rate) led to a fall in loans and a rise in the rate of unemployment. Kashyap and Stein (1994) extending the same data to 1990 and using the same methodology arrived at the same conclusions. Suzuki (2004) has also confirmed the existence of the lending channel in Japan.

Some authors disagree with these findings with the presence of the supply-versus-demand puzzle. The issue is that it is unclear whether the fall in the quantity of loans was occasioned by the inability of firms to ask for new loans due to a gloomy business outlook, or that the suppliers of the loans could not afford to meet all demands for loans as a result of the increased cost of accessing reserves with the Central Bank. As the argument goes, the observed fall in loans may be interpreted that drops in aggregate output, following the traditional money channel, depressed firms' demand for loans so that the presence of the lending channel may not necessarily have the contribution credited to it.

In an attempt to determine whether the observed fall in bank loans was occasioned by a fall in loan demand of firms or merely a change in the composition of the loan portfolio, Kashyap, Stein and Wilcox (1993) considered the fluctuations in bank loans and commercial papers. Their results showed that when monetary policy is tight; the issuance of commercial papers increased even when bank loans fell. This result confirms that banks, when faced with tight monetary policy conditions tend to switch to other sources of advancing credit which are not subject to the statutory reserve requirements of the central bank.[4]. Also, in a bid to solve the supply-demand puzzle, Suzuki (2004) assumes that an observable quantum of bank loans is the equilibrium value given by the intersection of demand and supply curves in the bank loans market. Given the imposed equilibrium a negative correlation between price and quantity identifies a shift in supply while a positive link signals a shift in the demand function.

The effort of Kashyap, et al, in identifying the shift in supply using fluctuations in loans and commercial papers has been criticized by Oliner and Ruderbusch (1996). They argue that the credit behaviour of small firms is different from that of the big firms in the sense that the latter could rely on own funds or even resort to other avenues for funding with relative ease, while the former are predominantly bank dependent. .The contention is that their model assumed a homogenous loan demand function for all

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[4] *Commercial papers are not treated as balance sheet items for the purposes of computing reserve requirements.*

firms. The reasoning is that large firms are more likely to raise funds through the issuance of commercial papers than the smaller ones, implying that the suggested inward shift in loan supply may not capture the behaviour of smaller firms. This point shows that the use of aggregate data for the analysis of the lending channel of monetary transmission mechanism is inadequate.

Kashyap (1997) has presented a micro approach to analyzing the lending channel. The advantage of this method derives from the introduction of heterogeneity in the demand functions of firms. He disaggregated firms according to sizes and tested the prediction that monetary policy tightening affects smaller firms more than larger ones mainly because smaller firms are more dependent on bank loans than other sources of funding. The prediction was confirmed. The downside of this approach rests in the fact that the aggregate impact on the economy of any monetary policy action may not be properly gauged.

Testing for the existence of the credit channel of transmission mechanism in Japan, Suzuki (2004), using quarterly data from 1980Q1 to 2000Q4, affirms that monetary tightening, represented by an unexpected increase of 0.25 percentage point in the overnight call rate causes the quantity of new loans to shrink by about 3.5 per cent in the quarter following the policy action. Loan prices also increased with the policy action. In the same research, Suzuki found that monetary policy works efficiently in Japan with the observation that real GDP falls by 0.5 per cent in the 11th to 12th quarter after a 0.25 percentage point hike in the overnight call rate. His findings are, therefore, supportive of the existence of the lending channel of monetary policy transmission mechanism.

In their quest to confirm the lending channel for continental Europe (Germany, France, Spain, and Italy), Carlo et al (1999) utilized information from 651 banks from the included countries to determine how bank lending responded to the monetary tightening of 1992. Their results show that the lending channel of monetary transmission does not hold in the area. However, they conclude that the shift in the loan functions of strong banks are more insulated from monetary policy action than smaller ones.

The latter finding is consistent with the extended lending channel prediction that tight monetary policy disproportionately impact on smaller firms.

II.2   Some Facts on the Lending Behavior of Deposit Money Banks in Nigeria

In Nigeria, two broad monetary policy regimes could be distinguished. The first regime was characterized by direct administrative controls on credit and interest rates, while the other dwells on the era where credit to the private sector was competitively distributed. In the first period banks were assigned mandatory guidelines on how much credit to make to preferred sectors of the economy. Thus, banks made loans essentially in order to meet government regulations and not necessarily based on the expected returns. Nnanna (2001) found that distortions in the pricing of loans caused by the administrative intervention in the market rendered financial intermediation by the deposit money banks ineffective. In the liberalised era, deposit money banks engage in diligent credit packaging and risk analysis before making loans in order to reduce carrying non-performing assets in their books. Nnanna and Dogo (1998) have shown that financial liberalization has led to increased credit to the private sector of the economy. However, evaluating the sectoral distribution of loans by the deposit money banks in Nigeria, it could be observed that the real sectors of the economy have not benefited proportionately. This situation could be attributed to the relatively high risk premium and the long period of pay back associated with the sector.

III.   Model, Data and Hypothesis

III.1 The Model and Included Variables

The method adopted in this paper is the Vector Autoregressive (henceforth VAR) methodology and draws mainly from the benchmark specification for the euro area as presented by Peersman and Smet (2003). The major attraction to the use of the VAR methodology is the fact that it enables the estimation of the interdependence amongst variables without necessarily holding the impacts of any of the variables constant. The method

also captures the contemporaneous and lagged responses of the variables simultaneously. The VAR takes the form;

$$Y_t = A(L) Y_{t-1} + B(L) X_t + U_t \quad \text{...(1)}$$

Y is a vector of endogenous variables while X is a vector containing the exogenous (foreign) variables. The assumption underlying the exogeneity of the foreign factors is that there is no feedback from the domestic variables to the foreign variables (see Ignazio, et al 2003)

The benchmark specification for the vector of exogenous variables X contains world commodity price index (wp_t), United States real GDP (y_t^{US}) and the US short term real interest rate (s_t^{US}).

$$X_t = (wp_t, \; y_t^{US} \, s_t^{US}) \quad \text{...(2)}$$

While the vector of endogenous variables Y includes domestic GDP (y_t), domestic prices (p_t), domestic short term nominal interest rate (s_t), broad monetary aggregate ($m3_t$), and the real effective exchange rate (x_t)

$$Y_t = (y_t \, p_t, \, s_t, m3_t, \, x_t) \quad \text{..(3)}$$

This paper will be concerned primarily with the vector of endogenous variables Y_t. The concentration on the endogenous variables is informed by the fact that the Nigerian economy is largely mono-product, relatively small and does not have an internationally competitive manufacturing sector. Therefore, the impact of world commodity prices on the GDP can be assumed to be insignificant. Also, the financial market is relatively small and the current account component of the balance of payment (BOP) is not fully liberalised. Thus, there would be little reason to affirm that interest rate developments in the US could have an observable direct impact on the money market in Nigeria[5].

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[5] *Saying otherwise would imply that substantial foreign direct investment have flown in to Nigeria on account of the very high differential between interest rates in Nigeria and the United States*

Without the inclusion of the exchange rate variable, equation (3) is the standard IS-LM model; output, prices, short term interest rate and money. The lending channel as propounded by Bernanke and Blinders (1992) extends the IS-LM model to include the loans market. Thus, key variables to capture the developments in the loans market will be included in the model. These additional variables include the quantity of loans (q^L) and the corresponding loan prices (p^L). These are the key variables being evaluated by the lending channel of monetary policy transmission mechanism. As the Nigerian economy is considerably small and open, it will be worthwhile to retain exchange rate in the model especially, bringing to reckon the fact that the Nigerian economy is an import dependent one. Thus, a depreciation in the exchange rate could cause an increase in import prices (ceteris paribus), leading to a corresponding increase in the demand for letters of credit (LCs) and other forms of foreign loans made to exporting countries The variable also provides a veritable source for reflecting other forms of trade and monetary policy shocks in the rest of the world. The measure of monetary aggregates (m3) has also been replaced with broad money (m2). The model to be estimated can be presented as follows,

$$Yt = (y_t\, p_t,\, s_t,\, m2_t,\, x_t,\, q^L\, p^L) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4)$$

Where;

y_t =   GDP
p_t =   Domestic prices (proxied by the consumer price index)
s_t =   Treasury Bills Rate (proxy for MRR)
$m2_t$ =   Broad Money
x_t =   Exchange rate
q^L =   Total quantity of all loans
p^L =   Price of loans (average maximum lending rate)

The MRR will be used as the source of monetary policy shock in the model. Since the MRR is merely an anchor rate, (but not a transactions rate), a proxy for it will be used in the model instead. To derive a suitable proxy, the paper utilizes the positive correlation between the MRR and the treasury bills rate in Nigeria as a guide (see chart below). Therefore, the TB rate will be used as the policy rate. This approach may be justified

for Nigeria on the grounds that an increase in the Treasury bill rate may attract banks to increase their investment in government securities which are almost risk-free to the detriment of loan seekers.

Minimum Rediscount Rate and Teasury Bills Rate 1970 - 2003
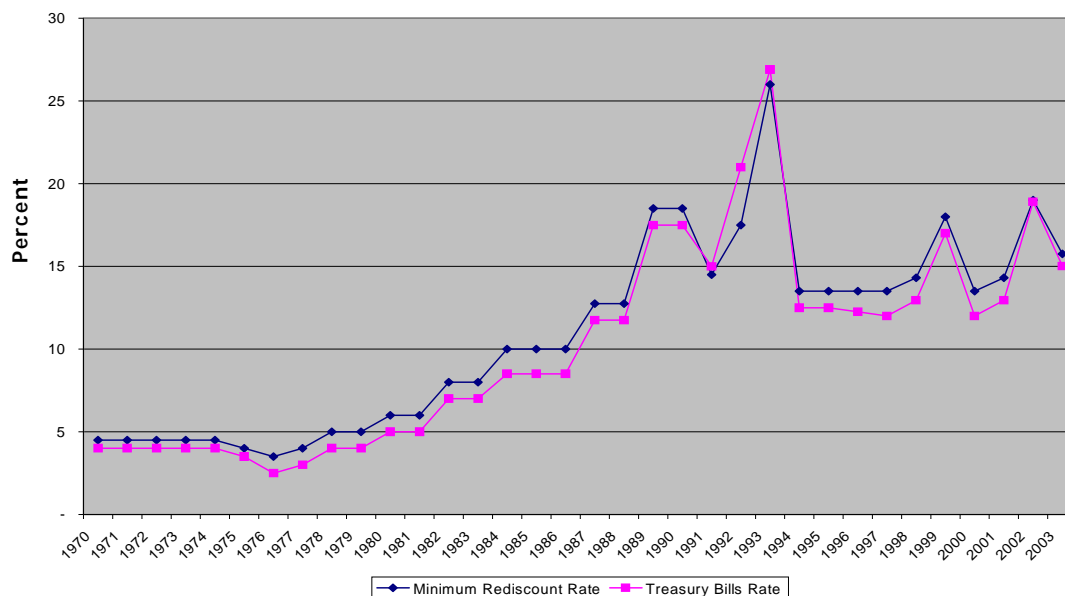
The price of loans will be represented by the deposit money banks' weighted average maximum lending rate. Also, the total loan stock can be assumed to be an inventory of new loans since commercial bank loans in Nigeria are predominantly short termed (see chart below)

Short Term and Total Loans
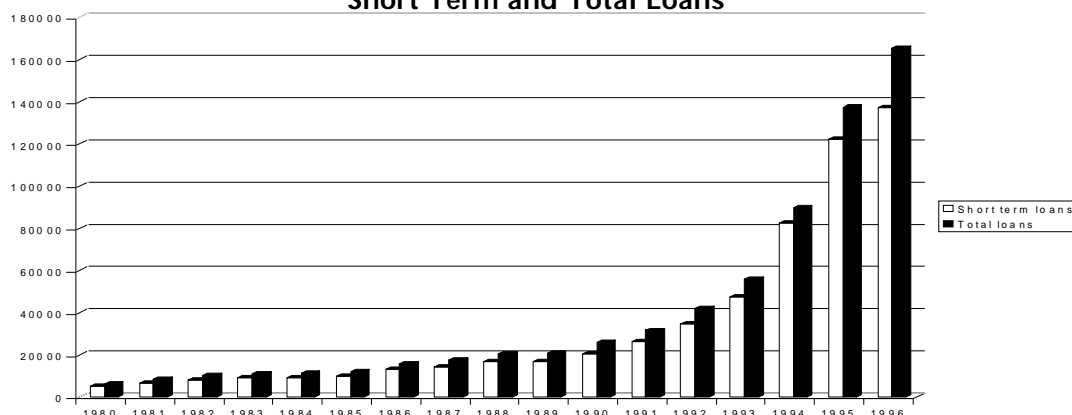
Operationally, all the variables in the model are evaluated in their log forms except the loan price and the policy interest rate which are in percentages. The use of the log values of the variables will enable the estimated coefficients of the variables to be interpreted as elasticities. The operational equation is presented below,

$$Yt = (Logy_t, Logp_t, s_t, Logm2_t, Logx_t, Logq^L, p^L) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(5)$$

The annual series data used in the paper span between 1970 and 2000

III.2 Statement of Hypotheses

The hypothesis to be tested, **H0** is that the lending channel (of the transmission mechanism) holds in Nigeria, against the alternate hypothesis, **H1**, the channel does not hold in Nigeria. To accept **H0**, the result of the estimates must show that as a result of an increase in the TB rate (monetary tightening,)
1. The quantity of loans ($Logq^L$**)** advanced by commercial banks decreases and/or
2. The price (p^L) of loans increases

Otherwise H1 will be accepted.

IV.   Estimation Results

The results of the estimates are presented as follows. The ordering of the variables follows the standard cholesky procedure. *Yt = (Logy_t, Logp_t, Logm2_t, s_t, Logq^L, p^L, Logx_t).* The reasoning behind the ordering is that a monetary policy shock does not have a contemporaneous impact on output, general price level and the quantity of loans. Exchange rate is expected to respond immediately to policy shocks while the response of loan prices will show up immediately in new loans. It can also be shown that the impulse responses are robust to alternative orderings. (Several other ordering alternatives were done)

The empirical findings shown in the figure 1 below represent the various responses of GDP, CPI, Quantity of loans, Price of loans and the (nominal)

exchange rate to a one standard deviation (0.25 percentage point) positive shock on the treasury bills rate at 5 to 10 per cent level of significance..

As the result shows, an increase of the minimum rediscount rate by 0.25 percentage points will leave the quantity of loans made by the commercial banks unaffected in the first period. The lagged fall in the quantity of loans is consistent with expectations that loan contracts take some time to be adjusted. In the second period, the quantity of loans drops by 3.3 per cent. The highest fall in the quantity of loans as a result of the monetary policy innovation is recorded in the third period at 6.5 per cent. All the results were statistically significant. This evidence confirms that an increase in the MRR causes banks to reduce the quantity of loans which they extend to their customers. The null hypothesis that the lending channel of monetary policy transmission mechanism exist in Nigeria is therefore accepted.

Figure 1
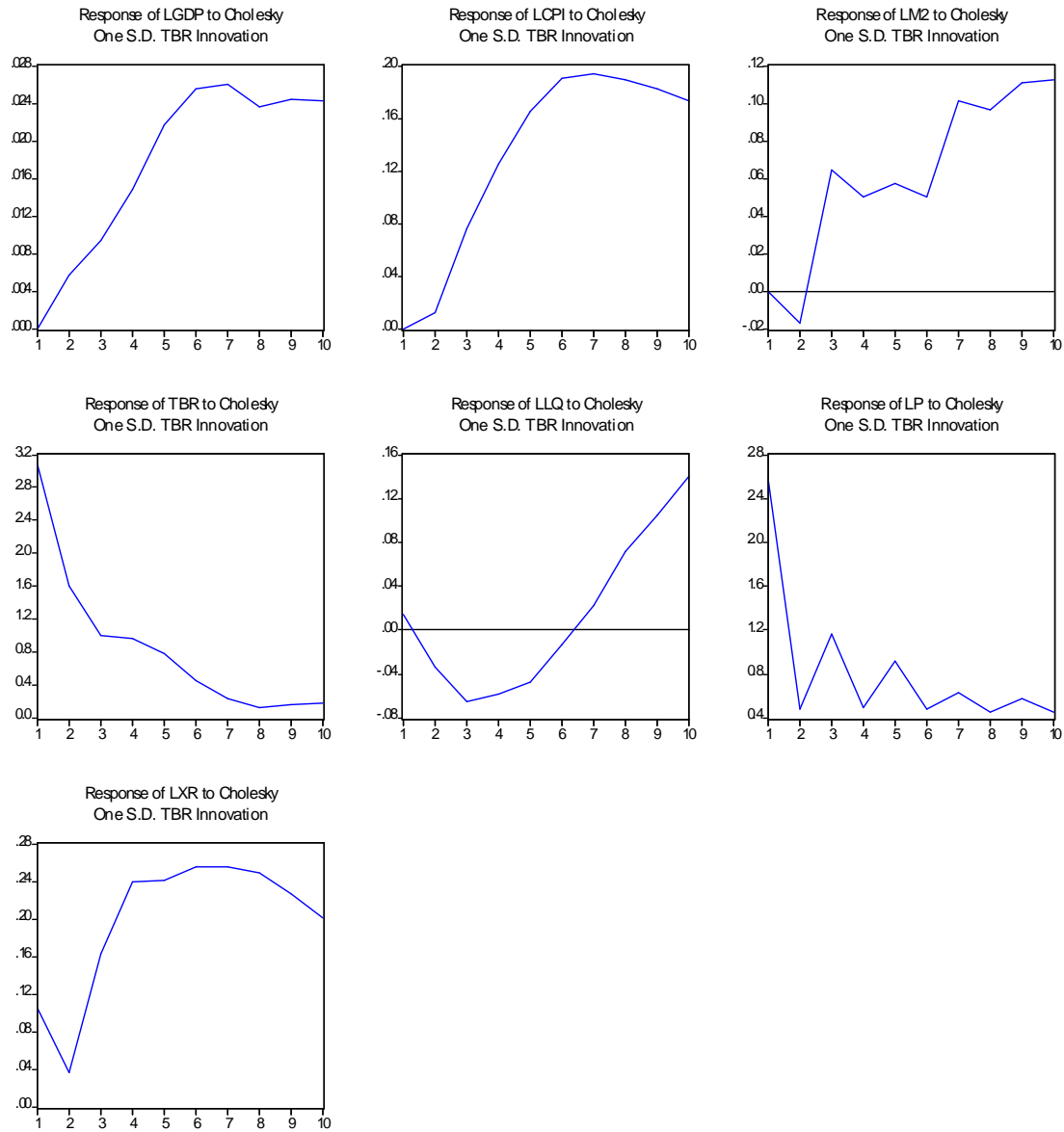
The response of deposit money banks' loans to changes in the MRR could be explained by the following points

1)   Deposit money banks, until recently, were not sufficiently disposed to interbank lending as they showed preference to offloading funds in excess of transaction requirement at the central bank. Therefore, a contraction in the policy rate would affect the quantity of loans made out.

2)   The capital market is not well developed - since the capital market is not well developed the problem of information asymmetry is deeply seated in the process of financial intermediation. The implication of the situation is that speculation becomes an added implicit cost factor in the funds market- working to increase the premium on alternative sources of capital.

3)   The savings rate is low in an economy - low savings rate in an economy presupposes increased difficulty on the reliance on own funds and alternative sources of funds.

4)   The length of time for adjustment by banks is long - the length of time it takes banks to grab alternative avenues for funds poses a form of cost which would render their actions susceptible to central bank's dictates. The time of adjustment is particularly important in the sense that banks do not wait until they have sufficient deposit base before making loans. Rather deposit money banks, most times, make loans then begin to look for the resources to consummate the contract. Therefore, if the adjustment period is long, when the monetary authorities increase the rediscount rate banks are forced to shed new and marginal loans in order to be able to sustain current contracts.

The behaviour of loan prices also confirms the presence of the channel in Nigeria. A 0.25 percentage point increase in the MRR leads to an increase of the prices of loans by 2.57 per cent in the first period. In the second period the rate of increase drops to about 1 per cent. The increase in the

price of loans persists, though with remarkable fluctuations in the rate, all through the sample period. However, the observed increases in prices were not statistically significant.

Other Findings

The GDP is expected to decrease with an increase in the MRR. This position would hold given the a priori expectation that the fall in the quantity of loans leads to reduced investment and therefore a fall in the aggregate level of production. Evidence from these estimates does not confirm this notion for Nigeria. A monetary policy shock induced by a 0.25 percentage point's increase in MRR does not have any observable impact on the GDP in the first period. However, in the 2nd and 3rd periods, GDP responds with a growth of 1.6 per cent and 1.7 per cent, respectively. In all the periods covered by the analysis, the growth in GDP is positively signed and, therefore, run counter to theoretical expectations. The outcome of this study appears consistent with credit flows in Nigeria. The increase in foreign assets, received mainly as oil revenue, which accrues to the federation account is distributed among the various tiers of government every month. The consequence of this is that accretion to credit (for investment) mainly emanates from government payments (especially for contracts) and not necessarily as a result of DMBs activities. Suzuki (2004) reported that GDP responded correctly to increases in the overnight call rate in Japan. The finding led him to conclude that monetary policy is effective in Japan. Agreeing with the position and extending the reasoning to Nigeria, it could be said that the link between monetary policy and the real sector of the economy is weak. Nnanna (2001) also posted the same finding that the expansion in domestic credit did not reflect in the anticipated increase in the aggregate level of output.

The model was re-estimated to verify whether the response of GDP to the policy shock would be different without the oil component. The non-oil GDP was used instead of the total GDP in the model. However, the result of the estimate remained the same.

The response of exchange rate meets the theoretical expectation. Theory posits that the exchange rate will rise with an increase in the policy interest rate. In the first period, a 0.25 percentage point increase in the MRR was followed by an increase, in the nominal exchange rate, of 10.4 per cent. In the second, through all the sample periods, the response of exchange rate was correctly signed and the estimates were statistically significant. The result here appears consistent with developments in the Nigerian financial system. Two reasons support this view. One, the frequency (now held twice in a week) of the Dutch Auctions System of disbursing foreign exchange makes it easy for any monetary policy shock to be felt immediately in the foreign exchange market. Two, the foreign exchange market is a competing outlet for banks' resources.

The response of broad money (M2) to the shock from the increase in MRR meets the a priori expectation. A 0.25 per cent increase in the MRR will cause M2 to contract by 1.7 per cent in the second period.

Lastly, the general level of prices as depicted by the CPI is not affected contemporaneously by an increase in the MRR. However, in the second period, it rises by 1.2 per cent. The increase in the CPI persists all through the sample period. This finding confirms that hikes in the interest rate cause the rate of inflation to rise. This could well be the case in Nigeria where wholesale production is largely supported by bank credits.

IV.1 Policy Issues

Some policy issues to be noted here are that,

1.   An increase in the MRR causes the quantity of loans advanced by the deposit money banks to fall with a lag of about 12 months
2.   The price of loans tends to rise contemporaneously with an increase of the MRR.
3.   Treasury bills rate has a contemporaneous and positive relationship with the minimum rediscount rate in Nigeria.
4.   Government securities are veritable investment alternatives to commercial banks

V.   Conclusion

This paper has evaluated the nature of the lending channel of monetary policy transmission mechanism. The major prediction of the approach is that a monetary tightening through increase in the policy interest rate will lead to a decline in the quantity of loans granted by commercial banks. Nigerian data from 1970 to 2003 have been utilized to ascertain the correctness of this hypothesis, using the vector autoregressive methodology. The results show that increases in the Treasury bill rate lead to a contemporaneous rise in the price of loans and a fall (with a lag) in the quantity of loans. Both affirm the existence of the lending channel medium for monetary policy transmission in Nigeria.

Also, the estimate of the response of GDP to monetary policy tightening showed that the increased price of loans and the decline in the quantity of loans do not translate to a corresponding fall in the aggregate level of output. Based on this, the paper suggests that the link between monetary policy and the real sector is weak. The response of the exchange rate indicates that there is a link between the foreign exchange market and the domestic market in Nigeria. Finally, the paper also found that increases in the policy interest rate in Nigeria leads to persistent rise in domestic prices.

Limitation of the Study

The major limitation of the study is the fact that annual data were used and this does not leave sufficient room to gauge the correct lag of policy actions on the included variables. It is therefore suggested that the lending rate channel should be investigated using higher frequency data.

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