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PROCEEDINGS OF THE SEMINAR ON "MONETARY POLICY IN A CHANGING ENVIRONMENT" FOR CBN EXECUTIVE STAFF

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Welcome Address

*C. E. Nkwonta**

Deputy Governor (Economic Policy),
Director of Research and Statistics,
Other Directors present,
Branch Controllers,
Invited Guests,
Distinguished Participants,
Ladies and Gentlemen,

I am highly honoured to welcome you all to this occasion of the 2007 CBN Executive Seminar. I am particularly delighted with the choice of Enugu as the venue of this seminar. The seminar serves as a forum by the executives of the Bank to brainstorm and exchange views on major topical economic issues that affect Nigeria's economic development. The theme of this seminar "Monetary Policy in a Changing Environment" is not only apt, but also very central to the current national policy thrust as embodied in the Vision 2020 and FSS 2020 initiatives. As Nigeria aims at becoming Africa's financial hub and among the 20 largest economies in the world by 2020, the need for a thorough brainstorming on monetary policy in this changing environment cannot be overemphasized. With the recent advances and developments in our financial system, coupled with the role monetary policy plays in any economy, it is pertinent that we position ourselves to take full advantage of the opportunities in line with FSS 2020 and Vision 2020. This underscores the significance of the seminar coming at this time. It is my sincere hope that the serene atmosphere of Enugu will promote a healthy discourse towards the articulation of appropriate policy measures to achieve the desired objective(s) of this seminar. I, therefore, enjoin all the participants to use this forum to enhance their general understanding of the critical issues of the subject matter.

The Deputy Governor, distinguished Ladies and Gentlemen, permit me to mention that Enugu is a city of peace and tranquility with recreation centers for relaxation.

**Mr C.E. Nkwonta is the Branch Controller, Central Bank of Nigeria, Enugu*

Being the seat of the old Eastern Region, the city has numerous tourist and historical sites. I, therefore, enjoin you all to avail yourselves of the educational and memorable moments these sites would offer. The venue of this seminar, Roban Hotels is conducive for both academic work and relaxation. You are also invited to avail yourselves of its facilities.

On this note, I, on behalf of the entire staff of CBN Enugu Branch heartily welcome you all to this momentous event. While wishing you successful deliberations, we pledge to assist the Department in every possible way to ensure the success of this very important seminar.

I thank you all for your kind attention.

Special Remarks

C.N.O. Mordi *

Deputy Governor (Economic Policy),
Departmental Directors/Their Representatives,
Branch Controllers,
CBN Executives,
Distinguished Resource Persons,
Ladies and Gentlemen,

It is my honour and privilege to present this address on the occasion of the opening ceremony of the 2007 CBN Executive Seminar. I will like to note that this is the 15th edition of the seminar series, which has provided a veritable platform for CBN executives to exchange views on topical issues and by extension, contribute to policy making. The Research & Statistics Department immensely appreciates and, hereby, acknowledges the total support it has enjoyed from the Management which has sustained the seminar series in the last one and half decades. We also acknowledge the co-operation which we have enjoyed from the Human Resources Department over these years. To our distinguished participants, we salute you for your unwavering interest. We feel very encouraged.

The theme of this year's seminar, "**Monetary Policy in a Changing Environment**" is very apt particularly in the context of the strategic re-focusing which we are currently undertaking both as an institution and as a nation. As a nation our vision, encapsulated in the FSS 2020 and the Vision 2020 seeks to position Nigeria as the financial hub of Africa and among the 20 largest economies in the world by the year 2020. To attain this herculean but achievable objective, the Central Bank, recognizing its role in the Vision as being strategic, must align its principal tool, the monetary policy, with the changing global conditions. As an institution, you would recall that the elaborate and painstaking re-engineering process which the Bank embarked upon since 1999 has redefined our vision "to become one of the best central banks in the world". A major fall-out of the restructuring exercise was to re-focus the Bank on its core mandate, the core of which is the maintenance of price stability.

* *Mr. Mordi is the Ag. Director of Research and Statistics Department, Central Bank of Nigeria, Abuja*

To give impetus to the above, the Bank is putting all the necessary institutional, human and material requirements in place in order to transit to Inflation Targeting (IT) as a framework of monetary management come January 1, 2009. Thus, as from that date, the CBN would discontinue the current practice of targeting monetary aggregates which relies on maintaining the growth of money supply at a level that is consistent with a projected growth in output and inflation. Key requirements for continued relevance of this framework are the stability of the money multiplier, the stability of the velocity of circulation of money and the existence of a predictable and stable relationship between the instrument/operating targets, intermediate targets, and the ultimate objectives of monetary policy. Recent empirical evidence tends to suggest some instability and a breakdown. The Bank would commence targeting the ultimate target itself through periodic adjustments of a policy rate to influence movements in the inter-bank interest rate to achieve the target level of inflation.

The implication of transiting to IT is that the Bank would now be put on the spotlight because unlike monetary aggregates which are blurred, inflation rate is very easy to relate with by the public. In other words, the outcome of our monetary policy actions would become more open to public scrutiny. Yet one cannot say with exactitude that the policy environment would have been (and may never be) rid of all the impediments to the success of IT framework. As you are already aware, some of these challenges include; fiscal dominance/liquidity surfeit, underdeveloped financial market/inefficient payments system, wide interest rate margins, inadequate coordination between monetary and fiscal policies and data issues. When the framework is finally adopted, the onus would rest squarely on us as an institution to creatively deal with these challenges as the public would be more interested in results than excuses.

There is no doubt that the task ahead of us is herculean but it is also gratifying to note that it is achievable. As we deliberate on the theme of this year's conference, let us bear in mind how our individual actions transmit through the mandate of our respective departments and ultimately to the attainment of the desired monetary policy objectives in a difficult environment. Let us take advantage of the able resource persons who would be facilitating at the conference to enhance our understanding of the totality of issues being deliberated upon. It is only by so doing that we can make meaningful contributions and justify the huge investment on the part of Management.

I wish you all very fruitful deliberations and I thank you for your kind attention.

Opening Address

*O. A. Demuren (Mrs.)**

The Deputy Governor, (Economic Policy),
Departmental Directors, Branch Controllers, All Executives,
Distinguished Participants, Ladies and Gentlemen,

I feel honoured to be invited to present the opening remarks for this year's CBN Executive Seminar holding in the coal city of Enugu. First of all, let me congratulate the Research and Statistics Department and the Seminar Planning Committee for coming up with such a topical theme, "Monetary Policy in a Changing Environment" which I consider very timely and which broadly captures the current mood and direction of the national economy.

There is strong evidence that since the CBN introduced the ₦25b minimum capital base for banks as part of the Banking Reform, the banks have, on their own, exceeded the stipulated minimum base in the process of recapitalization. These surplus funds raised by the banks, have empowered them to do a lot of things including increased lending capacity, product diversification, branch expansion, capacity building, infrastructure upgrade, etc. Their actions in these areas have greatly stimulated the economy with great implications for price stability and monetary management.

The same banking reform has also triggered phenomenal growth in capital inflows just as it has stimulated an aggressive drive by Nigerian banks to establish branches in foreign countries, participate in managing the nation's foreign reserves, seek quotation in foreign stock markets and consolidate into strong players in the global economy.

These developments carry with them associated risks, and consequently challenge our capacity as the nation's monetary authority, to design appropriate policy instruments not only to anticipate such risks, but also to contain them if and when they occur.

**Mrs Demuren is the Director, Human Resources Department, Central Bank of Nigeria, Abuja*

As global players, the economy is no longer insulated nor isolated from the "quakes" and "shakes" arising from the international financial system. And, considering our vision of the FSS 2020, our role in the West African sub-region and in the larger continent of Africa, we cannot but start today to build the policy framework necessary to anticipate emerging and potential change dynamics.

Here at home, we cannot lose sight of our regulatory responsibilities and the policy support instruments required to insulate the economy against possible shocks from liquidity surfeit, inflation, etc. The immediate consequence of consolidation is that Nigerian banks are now virtually into "everything" in the financial services sector; from capital market to mortgage finance, venture capital, leasing, insurance, forex, micro finance, etc. As financial supermarkets, what they do and what they do not do, have great implications for price stability and exchange rate movements. Hence, as regulators, we need appropriate policy measures to guard against such things as regulatory arbitrage, round-tripping, money laundering and other forms of financial crimes.

Equally important are internal policies for determining and managing liquidity including currency in circulation, government cash management and net foreign assets. It should be said here that the dichotomy between monetary and fiscal policies is increasingly becoming anachronistic. With the complexity of Government business, the sophistication of national and global economies and the volatility of monetary aggregates, the beginning of one concept and the end of another is now a matter of definition. The implication of this is that our monetary policy framework vis-à-vis the fiscal operations should be boundaryless, open and purposeful.

The Central Bank of Nigeria is more than ever before challenged to ensure the sustainability of the reforms in the financial services sector in the face of rapid change dynamics in the world economy. I must assure you that Management is also determined to create the enabling environment to achieve the objectives of the reforms through effective capacity building, provision of necessary IT infrastructure and tools and the development of people-oriented policies to facilitate enhanced productivity. Recent developments have shown that the Bank is adopting talent-hunt strategies to attract the desired expertise to drive its operations if it is to meet global challenges. Nevertheless, it should be acknowledged that on the job training and experience provide an added advantage for serving staff.

Ladies and gentlemen, we are, therefore, not only challenged collectively, we are even more challenged individually. I, therefore, enjoin all of you to take advantage of any learning intervention opportunities to acquire necessary skills/competencies for the job. This seminar as one of such interventions, provides us an opportunity to

task our creative talents, and agitate our capacity to envision the future for the good of the Bank and the nation.

As a global village, the space is wide open for us through the ICT to "forage into other lands" for knowledge resources not only to create, innovate and share experiences, but also to benchmark good practices, strategies and methods.

The time and circumstances are indeed auspicious enough for us to join the league of developed economies. That Africa, and indeed, Nigeria, is the economic destination of the next decade is no longer a prediction. The extent to which monetary policy and management are key to the achievement of the above objectives, (which are also boldly enunciated in the Vision 20: 2020 document), to that extent is this seminar critical to CBN's contribution towards the nation's march to becoming one of the top 20 economies of the world.

The seminar should, therefore, be both analytical and prescriptive coming as it were, with a Monetary Policy Master Plan for the realization of the FSS 2020. We in the Human Resources Department are poised to give you all the support you need to drive this vision.

Ladies and gentlemen, the ball is in your court and the game has just begun!

Wishing you fruitful deliberations.

Keynote Address

S. O. Alade (Mrs.) (Ph.D)

Director of Research and Statistics,
Departmental Directors/Their Representatives,
Branch Controllers,
CBN Executives,
Distinguished Resource Persons,
Ladies and Gentlemen,

It gives me great pleasure to be part of this important occasion of the 2007 CBN Executive Seminar organized by the Research and Statistics Department in collaboration with the Human Resources Department of the Bank. This Edition of the seminar, the 15th in the series is very important for the Bank as it is aimed at availing the Executives of the Bank the opportunity to brainstorm on contemporary monetary policy issues which form the central mandate of the CBN. Indeed, deliberations on the theme "Monetary Policy in a Changing Environment" is very apt given the Management's drive to reposition the Bank as a world class institution with expertise in appreciating and executing its core mandate.

The rapid changes in the global financial architecture and the role of central banks in driving economic reforms, particularly in emerging economies and developing countries have prompted the recent macroeconomic policy initiatives in Nigeria, especially in the financial services industry, beginning with the bank consolidation to the reforms in the payments systems, the introduction of new currency structure as well as the new framework for monetary policy implementation.

Monetary policy comprises a combination of strategies and instruments used by the monetary authorities to control money supply in an economy consistent with a desired level of short term interest rate, inflation and economic growth. In a changing economic environment, the choice of a monetary policy strategy is intertwined with the objectives of monetary policy which include ensuring price (inflation, exchange

* *Dr (Mrs.) S.O. Alade is the Deputy Governor, (Economic Policy) Central Bank of Nigeria, Abuja*

rate and interest rate) and financial stability. Thus, the conduct of monetary policy and the goal of price stability lie within the mandate of central banks, which underscores the importance and appropriateness of the theme of this year's Seminar, especially with the changing times.

Ladies and Gentlemen, as Executives of the Bank, I believe you are all conversant with the core mandate of the Central Bank of Nigeria (CBN). However, for the avoidance of doubt let me reiterate that the CBN Ordinance of 1958, CBN Act No. 24 of 1991 and CBN Act, 2007 mandated the Bank to:

Issue legal tender currency in Nigeria;

Maintain external reserves to safeguard the international value of the legal tender currency;

Maintain price stability;

Promote monetary stability and sound financial system in Nigeria; and

Act as banker and economic adviser to the Federal Government.

These mandates are not different from the generic functions of central banks the world over and must be at the finger tip of every central banker.

In maintaining the price stability mandate, the CBN pursues its monetary policy based on the policy regime and targets set to achieve macroeconomic stability. In Nigeria the policy regime has changed from the fixing of interest rates, exchange rate targeting, and the targeting of monetary aggregates to the current implicit policy of steering overnight interest rates that will transit to the proposed inflation targeting regime. For over one decade and half, monetary policy in Nigeria has focused on the targeting of monetary aggregates. The evolution of monetary policy regimes showed that during the 1960s through the early 1980s, the Bank relied heavily on direct controls, mainly reserve requirements, sectoral credit allocations without recourse to market-based operations. The policy environment was rather static with no major change except for the annual discretional adjustments of interest rates among economic sectors. The money market experienced the dearth of instruments to effectively conduct monetary policy. Consequently, interest rate regulation hampered financial deepening and retarded the development of both the money and capital markets.

With the adoption of the Structural Adjustment Programme (SAP) in 1986, the Nigerian economy, and in particular the financial sector went through extensive structural changes encompassing liberalization of key macroeconomic variables such as interest rate and exchange rate, technological innovations and regulatory reforms. Consequently, the Bank now relies on indirect techniques such as Open Market Operations (OMO) as the dominant instrument complemented by the cash reserve requirement among others in the execution of its monetary programmes.

The reforms in the financial sector are on-going and the consolidation in the banking industry, a component of the 13 point programme to reposition the financial system, has resulted in the emergence of twenty-five (now twenty-four) well capitalized and sound banks in the country. In addition, the Nigerian financial markets have become more diversified and integrated into the global market and less vulnerable to systemic failures.

The changes in the monetary policy environment, particularly the structural changes in the financial markets have potentially far reaching implications for the design and implementation of monetary policy. While some argue that financial reforms in Nigeria have still not advanced far enough to warrant changing our monetary policy strategy, it is widely recognized that financial liberalization and interest rate deregulation have affected the monetary policy transmission mechanism as well as created daunting challenges for the effective conduct of monetary policy.

An important element in the transmission mechanism of monetary policy is the relationship between the Central Bank's policy rate and other money market interest rates. There is a relationship between the CBN policy rate and the money market rates, exchange rate, asset prices and bank lending. These ultimately affect aggregate demand, inflation expectations and the rate of inflation. The monetary policy transmission mechanism involves instruments to control the supply and cost of settlement balances (bank reserves), the interest rate at which these balances are supplied and the operating target. Before the introduction of the Monetary Policy Rate (MPR) in December 2006, there was substantial deviation between the CBN Minimum Rediscount Rate (MRR) and short term interest rates. The volatility in the short term rates introduced uncertainty and weakened the monetary policy transmission mechanism, which is an indication of inefficiency in the inter-bank market.

The adoption of the MPR as a monetary policy tool was expected to allow the Central

Bank influence inter-bank interest rates in a simple and transparent manner as well as ensure effective liquidity management. It was to encourage banks to trade with each other rather than rely on the Central Bank when they need to adjust their surplus or deficit position. Market conditions were expected to be easier to manage since market participants would not expect the inter-bank rate to move significantly away from the MPR. With the introduction of the MPR and the CBN standing facilities, the volatility in the inter-bank rates was contained.

Measures implemented to revamp monetary targeting as a framework for monetary policy included medium-term monetary policy programme, effective communication through the Monetary Policy Committee (MPC) releases and the Bankers' Committee meetings, zero tolerance on Ways and Means advances to Government and the sterilization by Government of crude oil receipts above the budget benchmark price to checkmate liquidity surfeit. The fiscal rule oil price benchmarking and the medium-term expenditure framework have thus far restrained fiscal dominance, which has helped in containing liquidity surfeit. Hence, the successive attainment of single-digit inflation rates in the last seventeen months.

Monetary targeting is affected by unreliable/unstable relationship between different measures of monetary aggregates and policy targets/objectives, financial innovation, advances in information and communication technology, globalization, and the inability of changes in monetary aggregates under monetary targeting to properly signal central bank's policy intentions/stance to the financial markets. While the Bank has implicitly acknowledged the need to change the framework for monetary policy, it is unclear what the nature of any new policy framework will be, although there is a wide spread recognition that inflation targeting is particularly promising as alternative framework for monetary policy. To this end, the Bank is considering Inflating Targeting as an alternative framework for monetary management.

Inflation targeting is relatively immune to some of the vagaries of monetary targeting. Inflation targeting as a monetary policy framework sets an explicit inflation target over a given time horizon and monitors inflation forecast to achieve the overall macroeconomic goals. The key challenges of inflation targeting are: public announcement of numerical target for inflation; institutional commitment to price stability as the primary goal of monetary policy to which other goals are subordinated; robust information/communication strategy; increased transparency and accountability on the part of the central bank in attaining its objective.

Distinguished ladies and gentlemen, in the face of these realities, the task may look daunting but it is doable. Thus, it will be highly appreciated if the participants in this seminar would examine the issues on ground and come out with credible suggestions that would help in the design of an appropriate monetary policy framework that will be in consonance with our ever changing policy environment. Redesigning our monetary policy strategy is anchored on the need for the Bank to achieve its core mandate of price stability in addition to a stable exchange rate, full employment and financial stability. Appropriate design and implementation of monetary policy by the CBN would help in the attainment of the objectives of the financial sector strategy (FSS 2020) strategy, a programme to catalyze growth through financial sector reforms that would launch the economy into one of the 20 largest economies in the world by 2020.

I believe that with the crop of seasoned resource persons who have been assembled at this seminar you will come up with resolutions that will help the Bank move forward in the execution of its monetary policy. You should examine the available monetary policy strategies, and in particular the current implied interest rate targeting through the standing lending facility and see how it can be perfected as transition to either lite or full inflation targeting regime, assuming that overwhelming evidence show that monetary targeting should be discarded.

I urge you all to participate actively and make the best use of the opportunity availed by this seminar by making your contributions towards successful deliberations.

It is now my singular honour and privilege to declare this seminar open and to wish you very fruitful deliberations.

Thank you for your kind attention.

Overview of Monetary Policy in Nigeria

*S. N. Ibeabuchi**

I. Introduction

Monetary policy can be defined as the instruments at the disposal of the monetary authorities to influence the availability and cost of credit/money with the ultimate objective of achieving price stability. Depending on the mandate of the monetary authorities, the objectives of monetary policy may well go beyond price stability. More often than not, monetary authorities particularly in developing countries are saddled with a dual mandate - price stability and sustainable growth. In such a situation, monetary policy is used to achieve both objectives.

Monetary policy influences the level of money stock and/or interest rate, i. e. availability, value and cost of credit in consonance with the level of economic activity. Macroeconomic aggregates such as output, employment and prices are, in turn, affected by the stance of monetary policy through a number of ways including interest rate or money; credit; wealth or portfolio; and exchange rate channels (Akhtar, 1997; CBN, 1995). The monetary authorities apply discretionary power to influence the money stock and interest rate to make money either more expensive or cheaper depending on the prevailing economic conditions and policy stance, in order to achieve price stability. This is why Wrightsman (1976), concludes that monetary policy is nothing but a deliberate attempt to control the money supply and credit conditions for the purpose of achieving certain broad economic objectives. In general, most monetary authorities or central banks have been saddled with controlling inflation, maintaining a healthy balance of payments position to safeguard the external value of the domestic currency and promoting economic growth.

In Nigeria, the Central Bank of Nigeria (CBN) is the sole monetary authority. Its core

**Ibeabuchi is a Deputy Director in the Monetary Policy Department of the Central Bank of Nigeria. The views expressed herein do not represent the views of the institution to which he is affiliated.* *The author acknowledges the comments and suggestions of anonymous reviewers.*

mandate is to promote monetary and price stability and evolve an efficient and reliable financial system through the application of appropriate monetary policy instruments and systemic surveillance. The 1958 Act establishing the Central Bank of Nigeria gave it the following specific functions (which have endured in the 2007 CBN Act):

issuance of legal tender currency notes and coins in Nigeria;
maintenance of Nigeria's external reserves;
safeguarding the international value of the currency;
promotion and maintenance of monetary stability and a sound and efficient financial system in Nigeria; and
Acting as banker and financial adviser to the Federal Government.

Embedded in these objectives are two separate but highly related roles: A developmental role and financial surveillance (stability) role. The roles demand, among others, that the CBN focuses on both price stability and growth. In order to ensure the realization of the goals of price stability and economic growth, the CBN deploys its monetary policy instruments in such a way as to ensure optimality in inflation and growth outcomes.

It follows, therefore, that the efficient conduct of monetary policy is a major responsibility of the Central Bank of Nigeria. This is also true of most central banks. Monetary policy complements other economic policies to achieve government's overall macroeconomic objectives of internal balance and external viability. Monetary policy is usually confronted with the problem of managing excess liquidity, rapid expansion in credit as well as excess foreign exchange and capital inflows, particularly in resource endowed economies. In some other economies, mostly industrialized economies, monetary policy may be applied to tackle the problem of liquidity shortage and its uneven distribution as well as inflationary pressures arising from overheating of the economy.

The conduct of monetary policy in Nigeria has undergone several phases. Three of the phases are easily identified - the era of application of direct controls; the era of application of market instruments (or indirect controls), and the era of intense reform of strategy and institutions. The major objectives of policy has, however, remained unchanged, that is, price stability and sustainable growth of the economy.

II. Monetary Policy Process

The monetary policy process is a fairly complex process involving objectives and targets setting, monetary programming, choice of nominal anchor, policy instruments and the institutional framework for monetary policy implementation as well as communication and evaluation of outcomes. Some of the key activities are briefly discussed in this section.

i. Objectives and Targets

In Nigeria, the major objectives of policy are the attainment of price stability and sustainable economic growth. Associated objectives are those of full employment and stable long-term interest and real exchange rates. In pursuing these objectives, the CBN recognises the existence of conflicts of objectives necessitating at some point, some sort of trade-offs. The targets of monetary policy are in the case of the CBN the operational target, the intermediate target and the ultimate target. The Bank manipulates the operating target (reserve money) over which it has substantial direct control to influence the intermediate target, broad money supply, (M_2) which in turn impacts on the ultimate or final objective of monetary policy, i.e., inflation and output. The broad money supply (M_2) comprises narrow money (M_1) and quasi money while the operating target, reserve money is made up of currency in circulation and bank deposits with the central bank.

ii. Nominal Anchor

A nominal anchor for monetary policy is a single variable or device which the central bank uses to pin down expectations of private agents about the nominal price level or its path or about what the Bank might do with respect to achieving that path (Krugman, 2003). Generally, there are two kinds of nominal anchor; quantity-based nominal anchor and price-based nominal anchor. The quantity based nominal anchor targets money while the price-based nominal anchor targets exchange rate or interest rate. In the past, the CBN used broad money supply (M_2) as the nominal anchor for monetary policy. It is important to note that exchange rate targeting may not produce the desired effect if the interest rate is also subject to control at the same time. Some rules are necessary for effective monetary policy. In this case, prices such as exchange rate and interest rate may not be controlled or pegged at the same time. If interest rate is controlled, the exchange rate should be allowed to move freely for the necessary adjustment to materialise so that price stability could be attained.

iii. Monetary Programme/Model

In designing monetary policy, the CBN reviews developments in the economy over a period, articulates the major pressure for and risk to price stability and formulates a framework which will guide its monetary policy implementation. The framework which is essentially an approach to monetary management is based on a programme which sets out future trends in macroeconomic aggregates. ***The monetary programme*** defines the quantitative targets to be attained. The CBN uses the IMF financial programming framework in a medium term framework. This programme is updated from time to time to take account of developments in the course of the 2-year programme period.

iv. Monetary Policy Instruments

Until 1993 when open market operations (OMO) was introduced, the CBN relied almost exclusively on varying combinations of direct instruments of monetary control from time to time. These instruments included: credit ceilings, sectoral credit allocation, interest rate controls, imposition of special deposits, moral suasion, withdrawal of government deposits, stabilisation securities and exchange contols, etc. As the financial markets deepened over time as a consequence of the economy-wide macroeconomic reforms that commenced mid-1980s, the CBN started the process of shifting from the use of direct instruments to market-based instruments. The most significant move in the new direction came in June 1993 when the Bank introduced OMO. The market-based tools include in addition to OMO, reserve requirements which specifies the proportion of a bank's total deposit liabilities that should be kept with the central bank; and discount window operations under which the central bank performs the role of lender of last resort to the deposit money banks. Open market operations may be undertaken through outright transactions or through repurchase transactions. Repurchase transactions are temporary and are usually reversed at the expiration of the contract and involves the purchase of securities with agreement to sell the securities back at a later date with some financial consideration. On the other hand, reverse repo involves the sale of securities to a party with agreement to purchase the securities at a later date with some interest. Currently, OMO is the major instrument of monetary policy at the CBN. Other supporting instruments are discount window operations, moral suasion, foreign exchange sales/swaps and the standing facility introduced in December 2006.

v. Liquidity Management

Liquidity management involves the supply/withdrawal from the market the amount of liquidity consistent with a desired level of short-term interest rates or reserve money. It relies on the daily assessment of the liquidity conditions in the banking system, so as to determine its liquidity needs and, thus, the volume of liquidity to inject or withdraw from the market. The liquidity needs of the banking system are defined by the sum of reserve requirements imposed on banks, excess reserves, i.e. funds held in excess of these requirements, autonomous factors, i.e. a set of items on the central bank balance sheet which have an impact on banks' liquidity needs but are not under the direct control of the central bank (e.g. banknotes in circulation, government deposits or net foreign assets). Liquidity management is supported by daily liquidity forecasting of the central bank balance sheet to guide the Bank's management on the expected level of liquidity in the system over a period of time from the current period so that appropriate measures are taken to prevent undesirable market developments, that may negatively impact on the objective of price stability.

III. The Conduct of Monetary Policy in Nigeria

Theoretical framework

The objectives of public policy typically includes low and stable domestic prices, sustainable real growth of GDP, favourable balance of payments, reduction of unemployment, poverty reduction, etc. The Central Bank's role as an institution of government is to conduct appropriate monetary policy which is consistent with these objectives. In this regard, the central bank determines the amount of money supply that is consistent with the country's macroeconomic objectives and manipulates the monetary instruments at its disposal in order to achieve that amount.

In order to determine the money supply, the Central Bank uses information on the balance of payments, government budget deficit or surplus and other economic indicators, e.g., growth, prices, etc. On the basis of the information, three basic tables are prepared, namely: balance of payments, government budget and monetary survey. The three tables are shown below in simplified form:

BALANCE OF PAYMENTS (BOP)	GOVERNMENT BUDGET (Gov B)	MONETARY SURVEY
Current Account (X,I) + Capital Account = Change in NFA	Revenue - Expenditures = Change in NCG	NFA + NDA = M_2 or NFA + NDC + OAN = M_2

Where;
NFA = Net Foreign Assets
NCG = Net Credit to Government
NDA = Net Domestic Assets
NDC = Credit to the Domestic Economy (Net)
OAN = Other Assets (Net)
M_2 = Money Supply (currency in circulation + deposits)
X = Exports
I = Imports

As can be seen from the Table above, the three columns are closely linked. Both the outcome of the balance of payment (ΔNFA) and government budget influence the monetary survey. At the same time, the real growth of the economy and prices influence the balance of payments (growth in exports, demand for imports, etc.) and the government budget (oil revenue, tax collection, expenditures on wages, materials, etc). The monetary survey is the consolidation of the balance sheet of the Central Bank and the deposit money banks, (DMBs).
The monetary survey uses balance sheet identity of the form:

$M_2 = (M1 + QM) = NFA + NDC + OAN$ …….(1)
$\Delta M_2 = \Delta (M1 + QM) = \Delta NFA + \Delta NDC + \Delta OAN$ ……..……...(2)

Where:
M_2 = money supply (broadly defined)
M_1 = money supply (narrowly defined)
QM = Quasi-money or Time + Savings deposit at deposit money banks.
NFA = foreign assets (net)
NDC = aggregate domestic credit (net)
OAN = other assets (net)
Δ = change.

Thus, given the projected growth in output, inflation and accretion to external reserves (NFA), the Central Bank determines the level of money supply and bank credit consistent with the above macroeconomic framework using an appropriate form of the demand for money function such as:

$$\text{In } (M_2/P_t) = a_o + a_1 \text{ Ln } \pi + a_2 \text{Ln } Y + a_3 (M_2/P_{t-1}) + a_4 \text{Ln (i)} \quad \ldots\ldots\ldots\ldots (3)$$

Where,
(M_2/Pt) = real money supply (broadly defined deflated by the price level)
Pt = general price level at time t
π = inflation rate
Y = real gross domestic product
(M_2/P_{t-1}) = the dependent variable (real money supply) lagged one period

i = interest rate.

Given the computed values of broad money M_2, foreign assets (net) NFA and other assets net (OAN), the credit absorptive capacity of the economy, i.e., the change in aggregate domestic credit (NDC), consistent with growth in real GDP, inflation rate and the balance of payments target follows from equation (2), such that:

$$NDC = M_2 - NFA \ \ OAN \quad \ldots\ldots\ldots\ldots\ldots(4)$$
$$\Delta NDC = \Delta M_2 - \Delta NFA \ \ \Delta OA \quad \ldots\ldots\ldots\ldots\ldots(5)$$

The ensuing addition to aggregate domestic credit is then decomposed into credit to Government (ΔNCG) and change in credit to the private sector (ΔDCP). Having determined the level of government deficit to be financed by the banking system, credit to the private sector is derived as a residual:

$$\Delta DCP = \Delta NDC \ \ \Delta NCG \quad \ldots\ldots\ldots\ldots\ldots(6)$$

The ΔDCP so derived becomes the maximum amount of increase in credit to be extended to the private sector. The framework just described formed the basis of the credit ceilings imposed on individual banks until they were dispensed in September 1992.

Under the indirect approach, the level of monetary aggregates consistent with the achievement of macroeconomic objectives continued to be determined by the CBN

as explained above, but the achievement of the target was through the control of base money (B). The feasibility of controlling bank credit and, hence, money supply in this way hinges on the principle that banks maintain a stable relationship between their reserves (vault cash and deposit with central bank) and the amount of credit they extend, such that control can be achieved by controlling base money.

Concepts of Monetary Base or Base Money

Monetary base (B) is composed largely of:

(i) Currency with non-bank public (Cp);

(ii) Cash reserves of banks (R) comprising vault cash and balances held at the central bank;

The main sources of base money (B) comprise:

(i) Net Central Bank Claims on Government (NCBCG)
(ii) Net Foreign Assets of the Central Bank (NFACB); and
(iii) Other Assets (net) of the Central Bank (OACB)

Thus, the balance sheet identify of the Central Bank can be written as:

NCBCG + NFACB + OACB = Cp + R = B …..…….(7)

The Concept of Money Multiplier

The process of money creation and the concept of money multiplier derive from the idea that banks can and do expand money supply by a multiple of reserves available to them. This is shown in the relation:

$M_2 = m.B$ ……(8)

Where Money Supply (M2) is broadly defined

m = Money Multiplier; and
B = Base Money.

From (8), the multiplier may be derived as:

$m = M_2/B = (Cp + D)/(Cp + R) = (Cp/D + D/D)/(Cp/D + R/D)$ ……..…..(9)
Or

$M = 1+c/c+r$ ……..……..(10)
Where
D = deposits held by banks;
c = ratio of currency to deposits;
r = ratio of bank reserves to deposits;

And all other variables are as previously defined. Following from equation (10), equation (8) may be re-written as follows:

$M_2 = \{(1+c)/(c+r)\}(R+Cp)$ ……..…….(11)

Equation (11) can be used to estimate the level of money supply arising from a given level of base money (B) and the multiplier. Consequently, the Central Bank can control the money supply (M_2) through changes in bank reserves (R) and currency outside bank (Cp) which, as shown above, comprises its known liabilities.

The Central Bank can also influence the multiplier (m) in the desired direction. The currency-to-deposits ratio (c) is a function of the preference of economic agent for holding money either in the form of currency or demand deposits. While this ratio is generally thought to be outside the control of the Central Bank, it may be sensitive to interest rate movements. Bank reserves to deposits ratio (r) may be influenced by monetary policy instruments such as interest rate and open market operations (OMO). More importantly, (r) can be directly influenced by the Central Bank through the use of reserve requirements.

Institutional framework

The institutional set up of the monetary policy process affects the efficacy of monetary policy. In Nigeria, the Monetary Policy Department of the CBN articulates the monetary policy framework and produces draft monetary programme which is considered by the Monetary Policy Committee (MPC). The MPC also considers draft reports on the economy and assessment made by the staff of the Bank on which monetary policy deliberations and subsequent decisions are based.

The MPC deliberates on the monetary policy instruments which are subsequently implemented by the operational departments. The MPC meets every other month and has a calendar of meetings. It is the highest authority on monetary policy issues at the CBN. In line with the new CBN Act, the Committee must sit at least four (4) times in a year. Because the CBN has instruments independence, its monetary policy decisions are not vetted by any higher authority. The Committee comprises the Governor and four (4) of his deputies, two (2) external Board members, the Permanent Secretary, Ministry of Finance and a secretary, usually the Head of Monetary Policy Department. Following the enactment of the new CBN law, the membership of the Committee is expected to be expanded to include some appointees of the President and the Governor of the CBN.

At the CBN, there are other supporting institutional arrangements. These include the Monetary Policy Technical Committee (MPTC) and the Monetary Policy Implementation Committee (MPIC), Fiscal Liquidity Assessment Committee (FLAC) and Liquidity Forecasting Committee (LFC). These Committees perform different but complementary roles in the formulation and implementation of monetary policy at the CBN. The MPTC meets monthly to review economic and financial developments, on the basis of which it advices the MPC on the appropriate course of action. The Committee which comprises all the policy departments and some operational departments is anchored by the Monetary Policy Department. The MPIC meets weekly to review liquidity situation and take actions aimed at ensuring that the Bank's operational target, base money remains at the prescribed level. The committeee is chaired by the Deputy Governor, Economic Policy. The FLAC is an inter-agency committee comprising representatives of the Debt Management Office, the Budget Office of the Federal Ministry of Finance and the Office of the Accountant General, and the CBN represented by staff of the MPD and other key departments. The Committee is hosted on behalf of the CBN by the MPD.

Monetary Policy Implementation Framework

Prior to the banking sector consolidation exercise that was concluded in December 2005, the framework for monetary policy in Nigeria had witnessed some transformation. This included the shift from the use of direct monetary policy control to indirect (market-based) monetary management, and the switch from short-term framework to a two-year medium-term framework in the conduct of monetary policy. Although the objectives of monetary policy remained basically the same and monetary aggregates remained the intermediate target for achieving the ultimate objective of inflation during this period, there were some fundamental changes in the

strategies and instruments employed in the conduct of monetary policy in order to cope with the evolving financial environment. These changes are discussed below.

Era of Direct Control (Pre-SAP Period)

As has already been pointed out, prior to the introduction of the Structural Adjustment Programme (SAP) in mid 1980s, the monetary policy framework placed emphasis on direct monetary control. This was essentially due to the relatively underdeveloped nature of money and capital markets in the country then. The framework relied heavily on sectoral credit allocation; credit ceilings and cash reserve requirements; administrative fixing of interest and exchange rates; as well as imposition of special deposits. During this period the set monetary targets were hardly realized. Instead, the strategy created a lot of distortions and bottlenecks in resource allocation, resulting in wide spread inefficiencies in resource allocation and utilization.

Period of Indirect or Market Approach (Post-SAP Era)

In line with the economic deregulation embodied in the SAP, there was a paradigm shift from the hitherto repressive direct monetary control method to an indirect approach anchored on the use of market instruments in monetary management. This was borne out of the desire to eliminate the distortions and inefficiencies in the financial system caused by the prolonged use of administrative controls and the need to engender competition among banks and other operators in the financial system. Two major policy regimes of short- and medium-term frameworks can be identified.

Regime of Short-Term Monetary Policy Framework (1986-2001)

Consistent with the broad objectives of monetary policy, a number of monetary targets and instruments were adopted during the short-term (one-year) monetary policy framework (1986-2001). OMO, conducted wholly using the Nigerian Treasury Bills (NTBs), continued to be the primary instrument of monetary policy. This was complemented by the cash reserve requirement (CRR) and the liquidity ratio (LR). Other policy instruments employed included the discount window operations, mandatory sales of special NTBs to banks and a requirement of 200 per cent treasury instrument to cover for banks' foreign exchange demand at the Autonomous Foreign Exchange Market (AFEM). Interest rate policy was deregulated through the proactive adjustment of minimum rediscount rate (MRR) to

signal policy direction consistent with liquidity conditions. Surveillance activities of the CBN focused mainly on ensuring sound management and maintenance of a healthy balance sheet position on the part of deposit money banks (DMBs). On the external front, the official and inter-bank exchange rates were unified in 1999.

In spite of the reforms in the articulation and execution of monetary policy during this period, most of the monetary and financial targets were substantially missed. The actual growth rates in broad measure of money supply (M2) and aggregate bank credit for the years, 1999-2001, were higher than the targets by wide margins, (Table 1). Although, inflation performed better in two of the three years, aggregate output was sluggish during the period. The outcomes could be attributed to the expansionary fiscal operations of the three-tiers of government and the resultant liquidity overhang, as well as lack of coordination of monetary and fiscal policy implementation.

Table 1: Key Policy Variables (% except otherwise stated)

	1999		2000		2001	
	Targets	Outcomes	Targets	Outcomes	Targets	Outcomes
M_2	10.0	31.4	14.6	48.1	12.2	27.0
M_1	4.1	19.9	9.8	62.2	4.3	28.1
Agg. Credit to the Economy	18.3	35.5	27.8	(23.1)	15.8	74.8
Net Credit to Govt.	10.2	57.1	37.8	(162.3)	2.6	(94.6)
Net Credit to Private Sector	19.9	27.3	21.9	30.9	22.8	43.5
Inflation	9.0	6.6	9.0	6.9	7.0	16.5
Real GDP Growth	3.0	2.7	3.0	3.8	5.0	4.6

Regime of Medium-Term Monetary Policy Framework (2002-2005)

In 2002, the CBN commenced a two-year medium-term monetary policy framework, aimed at freeing monetary policy from the problem of time inconsistency and minimizing over-reaction due to temporary shocks. The new monetary policy framework, still in operation, is based on the evidence that monetary policy actions affect the ultimate objectives with a substantial lag. Under the framework, monetary policy guidelines are open to half-yearly review in the light of developments in monetary and financial market in order to achieve medium- to long-term goals.

The major objectives of monetary policy since 2002/2003 have been to subdue inflation to a single-digit level and maintain a stable exchange rate of the naira. Attention has also been focused on the need for a more competitive financial sector geared towards improving the payments system. The OMO has continued to be the primary tool of monetary policy, and is complemented by reserve requirements, discount window operations, foreign exchange market intervention and injection/withdrawal of public sector deposits in and out of the DMBs. The CBN has also continued to ensure banking soundness and financial sector stability, not only to ensure the effective transmission of monetary policy actions to the real sector but also to enhance the efficiency of the payments system.

The measures taken to strengthen the banking sector and consolidate the gains of monetary policy included the introduction of a 13-point reform agenda in the banking sector in July 2004 (the key point of which was the ₦25 billion minimum capital base for DMBs). The 2004/2005 monetary policy and credit guidelines were fine-tuned in 2005 in the light of changing environment. New policy measures introduced included maintenance of a tight exchange rate band of plus/minus 3 per cent, two-week maintenance period of cash reserve requirement and the injection/withdrawal of public sector deposits from the DMBs. The various measures put in place, complemented by improved fiscal discipline at the federal government level, impacted positively on the monetary aggregates in 2004 and 2005, resulting in the achievement of set targets during the period. The growth rate of real GDP also increased substantially, exceeding set targets in 2003-2005.

Table 2: Key Policy Variables (% except otherwise stated)

	2002		2003		2004		2005	
	Targets	Outcomes	Targets	Outcomes	Targets	Outcomes	Targets	Outcomes
M_2	15.30	21.55	15.00	24.11	15.00	12.26	15.0	34.61
M_1	12.40	15.90	13.80	29.50	10.80	8.60	11.4	29.7
Agg. Credit to the Economy	57.90	56.59	25.70	58.44	24.50	12.0	22.5	14.5
Net Credit to Govt.	96.60	(6,316.31)	(150.30)	26.80	29.90	(17.95)	14.5	(37.0)
Net Credit to Private Sector	34.90	11.79	32.30	24.11	30.00	26.61	25.24	30.8
Inflation	9.30	12.20	9.00	23.80	10.00	10.00	10.0	11.90
Real GDP Growth	5.00	3.48	5.00	10.24	5.00	6.10	6.0	6.23

The CBN was able to achieve the targets owing to the pro-active implementation of sound monetary policies, including zero tolerance on government borrowing from the CBN. From monetary policy point of view the reform of the financial system, a key component of which was bank consolidation, was intended to minimize macroeconomic instability arising from banking systemic distress; deepen the capital market; finance productive activities in the private sector, particularly non-oil sectors; minimize the counterfactual shocks of creating distortions in the money markets and the financial system; encourage investment inflows through effective participation of the industry in the global financial system, among others. As a direct consequence of the exercise, the capital base of Nigerian banks (combined) increased from about US$2.5 billion in June 2004 to about US$5.8 billion at end-December 2005. This has been accompanied by rising inflow of foreign investment into the sector till date. Virtually all the banks have been listed in the Nigerian Stock Exchange (NSE) with the capital market becoming more liquid and more capitalized. The banks now have the potential to finance big investment transactions as their single obligor limits have increased, while regulation and supervision have become more effective given that ownership has been diluted with more regulators having the legal authority to oversee them. The CBN can now focus on a fewer number of banks for effective supervision and zero tolerance towards infractions, and improved

corporate governance: greater transparency is being enforced and deployment of IT infrastructure (eFASS and RTGS) has significantly helped the process.

Monetary Policy Implementation Post-Consolidation (2006-2007)

The key feature of the monetary conditions during the period, 2006/07 included: persistence of excess liquidity despite reversal of historic conditions, for example, ways and means and emergence of a new but very important source of excess liquidity-increased private inflows. The objectives of monetary policy during the period remained unchanged. The monetary policy strategy during the period 2006-7 included:

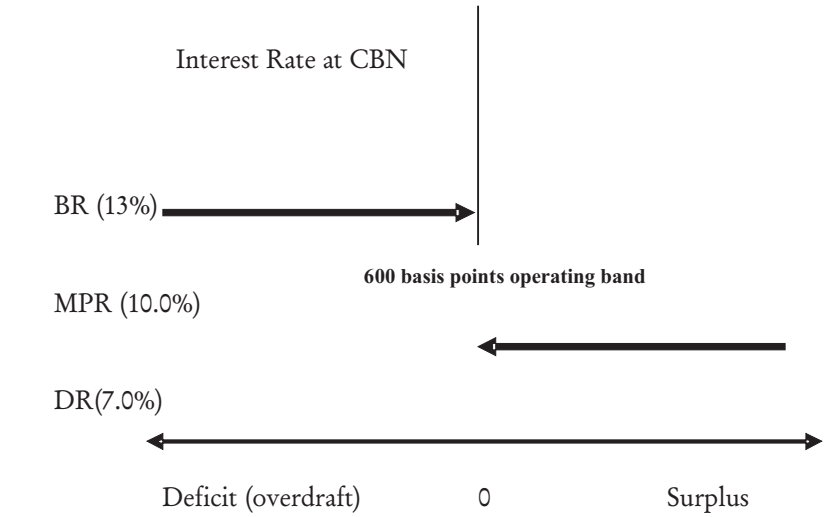
Zero tolerance on ways and means advances;
Gradual run-down of CBN holding of TBs;
Aggressive liquidity mop-up operations-frequent OMO sales supported by discount window operations;
Unremunerated reserve requirements;
Increased coordination between the Bank and the fiscal authorities;
Restructuring of debt instruments into longer tenor debts;
Increased deregulation of forex market; and
Occasional forex swap.

These strategies were complemented by the underlying reforms of monetary policy and the financial system in general.

Standing Lending and Deposit Facility

Interest rates behaviours and monetary policy response: A stable deposit base as opposed to volatile, short-term funds has started to impact positively on interest rates stability. In order to fast track interest rates stability, the CBN introduced a new framework for the implementation of monetary policy in December 2006. As part of the new framework, the Bank established a Standing deposit and lending facility rate and replaced the MRR with the MPR which was set at 10.0 per cent. The framework was designed as a corridor with the lending facility as the upper band of the corridor while the deposit facility rate served as the lower band. The corridor had a width of 600 basis points with the MPR at the centre.

Operating Band for Overnight Interest Rate



MPR – Monetary Policy Rate (Policy Target Rate) BR – Borrowing Rate
DR – Deposit rate.

The MPC on the recommendations of the MPTC reviewed the MPR. Following the adoption of the new framework, the erstwhile volatility in the inter-bank rate moderated significantly.

Other monetary policy outcomes: Relative to the past, the conduct of monetary policy during the period could be said to be fairly effective. Inflation and growth outcomes were closest to their targets during the period 2006-2007 compared to previous periods (Table 3).

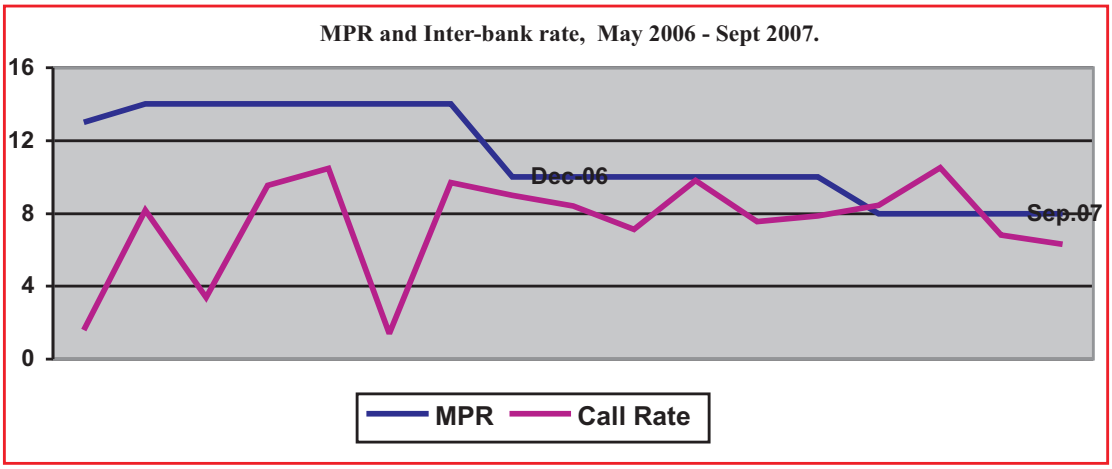
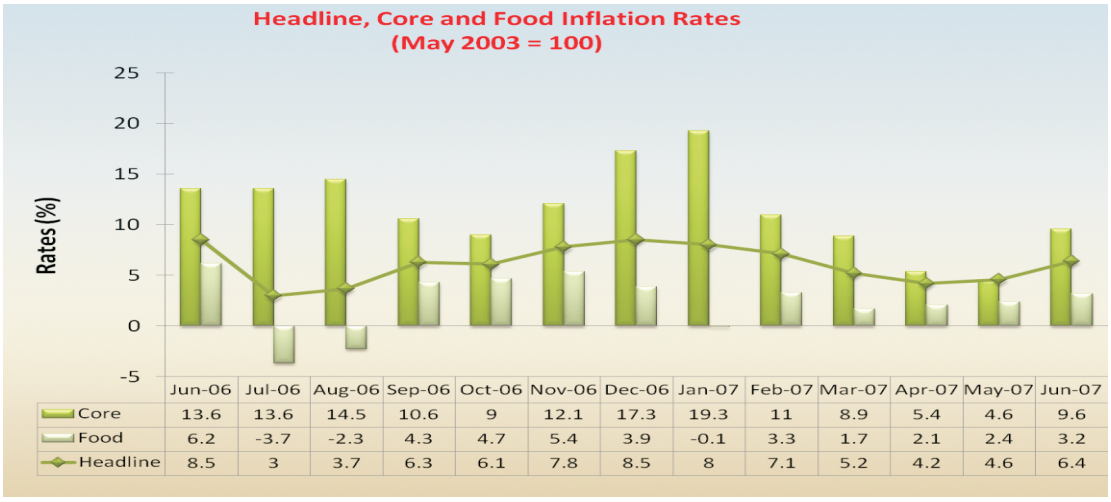


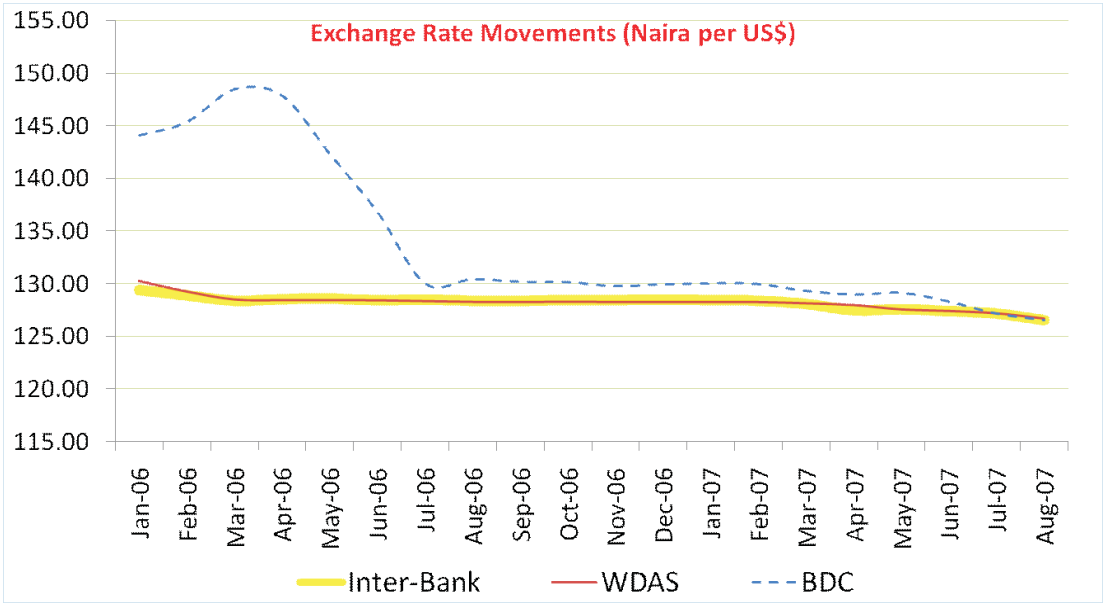
Table 3: Key Policy Variables (% except otherwise stated)

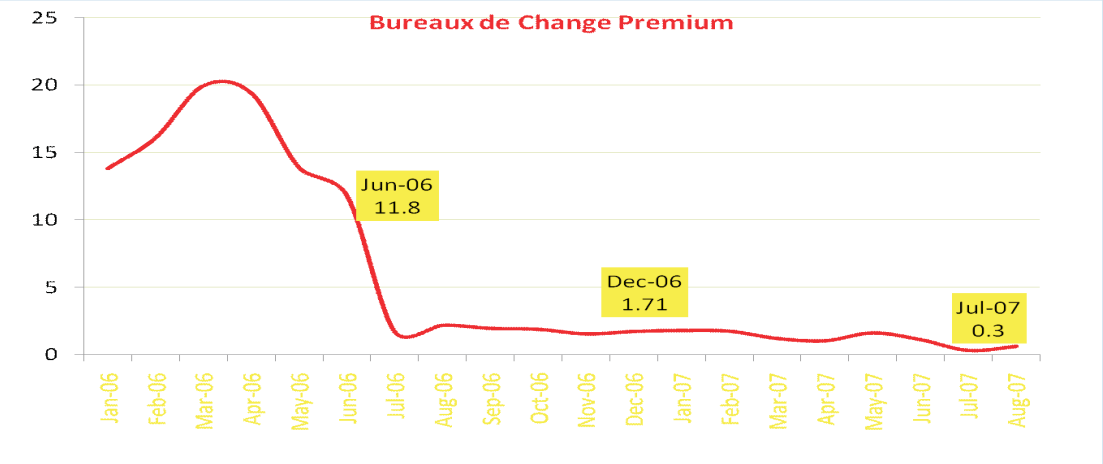
	2004		2005		2006		2007	
	Targets	Outcomes	Targets	Outcomes	Targets	Outcomes	Targets	June Outcomes
M_2	15.00	12.26	15.0	34.61	15.00	30.55	19.0	36.4
M_1	10.80	8.60	11.4	29.7	13.30	12.15	n.a	11.01
Agg. Credit to the Economy	24.50	12.0	22.5	14.5	22.50	-67.4	-29.96	
Net Credit to Govt.	29.90	(17.95)	14.5	(37.0)	(57.2)	(692.1)	(54.94)	
Net Credit to Private Sector	30.00	26.61	25.24	30.8	30.00	27.82	30.0	
Inflation	10.00	10.00	10.0	11.90	9.0	8.5	9.0	6.4
Real GDP Growth	5.00	6.10	6.0	6.23	7-10	6.03	7.0	5.69

Exchange rate was also relatively stable. The Bank's favoured measure of inflation, the year-on-year headline inflation has remained at single digit in the post bank consolidation period, while the exchange rate of the naira has been fairly stable.



	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07
Core	13.6	13.6	14.5	10.6	9	12.1	17.3	19.3	11	8.9	5.4	4.6	9.6
Food	6.2	-3.7	-2.3	4.3	4.7	5.4	3.9	-0.1	3.3	1.7	2.1	2.4	3.2
Headline	8.5	3	3.7	6.3	6.1	7.8	8.5	8	7.1	5.2	4.2	4.6	6.4





Future Direction of Monetary Policy

The current monetary policy framework is based on the targeting of base money as operating target with monetary aggregates as intermediate target. The ultimate objective is to influence the general level of prices - inflation. Monetary targeting implied by the current practice was considered adequate as a result of the level of development of the financial system. In most industrialized economies, monetary framework is predicated on short term interest rate, set by the central bank to influence financial conditions and ultimately, aggregate demand. On the other hand, where financial markets are not well developed, reserve requirements are applied along with controls on interest rate and credit allocation (Fry; 2000: 4). The CBN's monetary policy framework and the instruments for monetary management have been fine-tuned over the years for more robust outcomes. The Bank has kept the conditions in the financial markets under constant surveillance and has applied measures considered appropriate to stem undesired effects.

Given the improvements in the monetary policy environment in the last few years and also the need to consolidate the gains of improved inflation performance, the CBN may well be on its way to a new monetary policy framework, inflation targeting. The major argument for inflation targeting is that it is a better anchor for inflation expectations. Also, the fact that monetary aggregates targeting suffers

from a number of limitations, which include the instability of the money multiplier and velocity of circulation of money as well as the transmission path of monetary policy, makes it less likely to produce desired outcomes on a sustainable basis.

The major area of concern, however, is the commitment of the fiscal authorities to adhere in the future to prudent fiscal operations which will rule out financing by the banking system, especially the CBN. Current efforts aimed at ensuring sustained fiscal prudence are encouraging and when institutionalized through the passage of the Fiscal Responsibility Bill, an enabling environment would have been created for a more robust monetary policy. An inflation targeting monetary policy regime will enthrone more transparency in monetary policy. It will make monetary policy more credible and help to anchor inflation expectations. Once it is understood that the CBN is committed to a particular level of inflation, the banks and non-public will act in concert to ensure its attainment. However, if they do not believe the CBN, the anchoring of inflation expectations may be difficult. The CBN has demonstrated seriousness of purpose and credibility with the banking consolidation and the reform of the foreign exchange market.

Concluding Remarks

This paper presents an overview of monetary policy in Nigeria. It has attempted to review developments in the past as well current and future concerns. In spite of the successes of monetary policy in recent times, it is recognized that challenges still exist. These include:

Liquidity Surfeit. This has been one of the major challenges of monetary policy in Nigeria, especially given the cash-based nature of the economy. More so, the expansionary profile of fiscal policy has continued to constrain the impact of monetary policy.

Sustenance of Current Monetary Policy Initiatives. Recent monetary policy initiatives like transparency requirements on DMBs, stoppage of payment of interest on DMBs overnight deposits, etc may require firmness on the part of the Bank in view of the anticipated pressures from the DMBs for an early review.

Narrowing the Spread between Savings and Lending Rates: Narrowing the spread between savings and lending rates remains a challenge for monetary policy. There has been some improvements following recent reforms, but there is still room for improvement, and this should be a key concern of policy in the years ahead.

Financing Real Sector Investments. Given the dual mandate of the CBN, monetary policy must be tailored to promote real sector lending. With the large capital base now at banks' disposal, it is envisaged that the required capacity would be available to finance long-term investments in the real sector in such areas as power plant; telecommunication; oil and gas; railway, etc. Monetary policy must, however, be such that enables this to happen. The recent move by the MPC to stop paying interest on banks overnight deposits is in part aimed at this, i.e. deepening the credit market.

Fiscal Dominance. Another serious challenge to the conduct of monetary policy is the continued fiscal dominance occasioned by expansionary fiscal operations of the three tiers of government. Effective coordination between monetary and fiscal policies which is now in place deserves to be sustained and strengthened.

Data Problem. The absence of reliable data on current basis, especially from the DMBs, makes timely intervention in the money market difficult. The CBN recently deployed new IT solutions which are intended to improve banking system IT network connections. This, we hope, would improve the timeliness of data rendition by banks to the CBN for the conduct of monetary policy.

Banking System Surveillance. With the completion of the first phase of the banking sector consolidation exercise and the emergence of bigger and stronger banks, the next challenge is greater monitoring and supervision, in order to stem future occurrence of banking distress in the country. This explains the monetary authorities' shift to risk-based and rule-focused supervisory approach.

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Monetary Policy and Economic Growth: Theoretical and Conceptual Issues

*D. G. Omotor, Ph. D**

I. Introduction

Interest in the discussion of economic growth and development dates back to the making of economies. There is no doubt about this because growth confers many benefits. A few of the most important ones are; firstly, economic growth raises the general living standard of the population as measured by per capita national income; secondly, economic growth makes many kinds of income distribution easier to achieve; thirdly, economic growth enhances the time frame of accomplishing the basic necessities of man, for example shelter, food, clothing, etc, by a substantial majority of the population. This may even make the society begin to worry about the litter, pollution, etc that come with growth itself; and finally, rapid growth rates are often cited by countries of the might or right of their economic and political systems or even prestige (Lipsey, 1982; 693). Despite these benefits, economic growth in the last decades has been the focus of heated debate. Controversies that trail growth-related issues are energy crisis, environmental pollution, and population explosion among others. More incontrovertibly is the discourse on economic growth and development within the context of macro-behaviour of the economy and how policy goals could be achieved by the available instruments.

The four major goals of macro-policy are: low and stable level of unemployment, satisfactory balance of payments, stable price level and a high rate of output growth. These goals are inter-related and three kinds of variables which are ultimately targeted in achieving these macro-policy goals are the intermediate variables (variables that policies cannot affect directly and whose behaviour, the policy-maker do not have direct interest), the instrument variables (variables whose behaviour,

* *Dr Omotor is of the Department of Economics, Delta State University, Abraka.* *The views expressed herein do not represent the views of the institution to which he is affiliated or those of the central bank of Nigeria.* *The author acknowledges the comments and suggestions of anonymous reviwers.*

central authorities can change) such as the rates of taxes and the level of government expenditure (fiscal policy instruments) and the cash reserves of the commercial banks (monetary policy instruments). Others are the policy variables (variables in which the policy maker is ultimately interested) in the form of balance of payments, unemployment, the price level and the growth rate whose behaviour the central authorities wish to change. In a simple example, a change in the instrument variable such as the minimum rediscount rate (MRR) affects an intermediate variable, investment spending, which ultimately affects the policy variable such as the growth rate of GDP. How then is monetary policy linked to economic growth or economic development? Put succinctly, how does monetary policy relate or influence economic growth and development and by extension the economy? This inference is what this paper will espouse.

The specific objective of this paper is to a large extent answer the question posed above by enunciating the conceptual and theoretical issues that relate to monetary policy and economic growth. From the onset, it is also imperative to state that this paper does not delve into clarifying the difference nor discuss the debates between the concepts of economic growth and economic development. The two concepts are used interchangeably in this paper to relate and espouse the same thing.

The rest of the paper is divided into five sections. Following the introduction in section 1, section 2 discusses the objectives of monetary policy. The monetary transmission mechanisms are schematically explained in section 3. Section 4 reviews the performance assessment of monetary policy and its framework in Nigeria. The constraints of monetary policy management in Nigeria are espoused in section 5. The final section concludes the paper.

II Monetary Policy and its Effectiveness

In general terms, monetary policy refers to a combination of measures designed to regulate the value, supply and cost of money in an economy, in consonance with the expected level of economic activity (Nnanna, 2001). Some other theorists refer to monetary policy in terms of the central bank actions to influence and/or target some measures of the money stock. However, the definition of monetary policy often incorporated in theoretical models focus more on the measure of high powered liabilities of the central bank. This definition was the foundation of the monetarist revolution in the 1960s and 1970s (Rasche and Williams, 2007: 447).

In another strand, monetary policy is perceived as the high powered liabilities of the

central bank. Such proponents ordinarily refer to monetary policy as the central bank actions to influence and/or target short-term interest rates or nominal exchange rate. However, Sargent and Wallace (1975) have contended that in a model with "rational expectations", the price level (and all other nominal variables) could be indeterminate if the central banks set targets for nominal interest rates, because the economy would lack a "nominal anchor". McCallum (1987) advanced the argument and showed that an appropriately defined interest rate rule which include a "nominal anchor" would avoid such indeterminacy. In the US, in the early years of Greenspan, interest rate rules that include a 'nominal anchor' in the form of a desired or target inflation rate became the basic specification of 'monetary policy' in theoretical discussions. These various definitions of monetary policy is influenced in part by developments in monetary theory and in part by interpretations of monetary history. Thus the changing role by the definition of monetary policy is but something of a moving target. This is presented in some details after the discussion on the effectiveness of monetary policy in the following sub-section.

Effectiveness of Monetary Policy

The 'ineffectiveness' of monetary policy debate is historically anchored on the legacy of the Great Depression in the United States and other industrialized economies. This plank is most prominent in Keynes' General Theory and the writings of "Keynesian economists" in the 1940s through the 1960s. The Radcliffe Committee Report and the first two reports of the Kennedy Council of Advisers in the United Kingdom and the United States, respectively, (presented below) as excerpted in Rasche and Williams (2007:448) are perspective examples on the effectiveness of monetary policy:

The intermediate object of monetary policy action is to affect the level of total demand… in the theory, monetary action may work upon total demand by changing the interest incentive; we believe that only very limited reliance can be placed on this. More certainly, monetary action works upon total demand by altering the liquidity position of financial institutions and of firms and people desiring to spend on real resources; the supply of money itself is not the critical factor. (Radcliffe, 1959, p 135).

Unless the Government acts to make compensating changes in the monetary base, expansion of general economic activity, accompanied by increased demands for liquid balances and for investment funds will tend to tighten interest rates and restrict the availability of credit… Discretionary policy is essential, sometimes to reinforce, sometimes to mitigate or overcome the monetary consequences of short-run fluctuations of economic activity. In addition, discretionary policy must provide the base for expanding liquidity and credit in line with the growing potential of the economy. (Council of Economic Advisers, 1962, p. 85).

The past 10 years have been characterized by an average growth rate of aggregate expenditures that is very high by historical standards and that has substantially outstripped the sustainable growth of supply of real goods and services. Contributing significantly to the growth of aggregate demand were rapidly increasing government expenditures along with monetary policies that were appreciably more expansionary than those in earlier post-World War II period. When the inflationary phase has lasted so long that expectations of further inflation are firmly embedded in the cost trend, a shift to policies of restraint first exerts an adverse deceleration effect and materializes only with a lag. Any convincing interpretation of the events during 1970 and 1973-4 must stress this difficulty. (Council of Economic Advisers, 1975, pp. 128-29)

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The least that can be discerned from the above is that monetary policy effectiveness has changed; and that can be viewed as equally important as fiscal policy for affecting both inflation and output fluctuations.

In the last three decades the discourse on the effectiveness and role of monetary policy is still a major debate in macroeconomics. The risk of 'monetarism' subsequent to the works of Friedman and Schwartz (1963); Anderson and Jordon (1968); Meltzer (1976 and 2003) have presented several planks. Firstly, some monetarists contend that sustained inflation was a monetary phenomenon and that central banks should be held accountable for maintaining price stability. The contention here is that central banks should control the stock of money in the economy rather than focus on targeting short-term nominal interest rates as a mechanism to achieve long-run inflation objective. (The reason for this is that, in a fiat money economy, the money stock provided the nominal anchor for the system (Rasche and William, 2007).

There are some other monetarists from the above group who equally believed that

inflation control was not the only concern of the monetary authorities. Anderson and Carlson (1970) viewed monetary policy as having significant effects on short-run fluctuations in real output, though it does not affect long-run output growth. Meltzer (1976, 2003) among others believe that monetary policy was responsible for the historical cyclical fluctuations in real output.

In the 1970s and early 1980s, macroeconomics witnessed the plantation revolution of the "rational ineffectiveness proposition" of the New Classical Macroeconomics. Some common works during this era were Sargent and Wallace (1975); Fischer (1977); Taylor (1980), among others. The initial interpretations of the rational expectations paradigm were that, if expectations are rational, they would render monetary policy ineffective in influencing real output both in the short-run and long-run. Thus, monetary policy has no role in output stabilization.

Further demonstration eventually revealed that it was the interaction of the rational expectations and perfectly flexible wages and/or prices assumptions that generated the "policy ineffectiveness proposition". This integration of ideology saw an emergence of a new thought known as the "New Keynesians".

The popularity of the New Keynesian models has eventually eroded the monetarist tenets of how monetary policy affects economic activity. Money in this cycle is less often spoken about especially when included in the discourse on "inflation". King (2002) equally cited in Rasche and Williams (2007:449) notes that:

There is a paradox in the role of money in economic policy. It is this: that as price stability has become recognized as the central objective of central banks, the attention actually paid by central banks to money has declined (p. 162).

The implication of this is that although monetary policy is essential in economic growth and development process of modern economies, its role in macroeconomic policy objective is becoming more passive. This is because its fundamental role has been streamlined to price stability and in recent times inflation targeting.

In contemporary literature and policy discussions, on some economies (New Zealand, Norway, Switzerland, Thailand, UK, Chile, Hungary, Colombia, Canada, etc), more attention is given to the role of an inflation objective in a central bank 'policy rule' as the nominal anchor. This constitutes the basis of the discussion on inflation targeting. Inflation targeting is a framework for policy decisions in which

the central bank makes an explicit commitment to conduct policy to meet a publicly announced numerical inflation target within a particular time frame (Egbon, 2006). As so far reported in the literature on inflation-targeting, a number of inflation-targeting countries as listed above have recorded effectiveness in their monetary policy and that central banks that have announced explicit numeric inflation objectives have been quite effective in achieving the stated inflation stabilization objective (Rasche and Williams, 2007); however, this is not without some problems in the implementation.

A Primer on the Role of Monetary Policy

The goals of monetary policy as earlier discussed include price stability, maintenance of balance of payments equilibrium, high employment and output growth and sustainable development. These goals which complement one another emphasize the basic macroeconomic objectives of most economies. There is a wide disagreement about these major goals, however, there is less agreement that these goals are mutually compatible, (Friedman, 1968:1). There is even least agreement about what monetary policy can do and what it cannot do in achieving the several goals. These disagreements have resulted in heated debates that are yet to climax. On the one hand of the debate are solicitors of monetary policy who advocate that monetary policy can and should be targeted at employment and economic growth in addition to price stability. The alternative thought enunciates that monetary policy should be directed solely at price stability.

The apparent conflict between these views according to Fry (2000) is resolved if it can be established that monetary policy can be used to accomplish the goals of high employment and growth only if it maintains stable prices. In such a case, price stability becomes a necessary condition for sustained economic growth and, thus, no conflict between the two objectives, since they imply the same thing.

An attempt to establish a resolution of the difference has a long history and dates back to 1958, when Bill Phillips demonstrated the existence of a stable relationship between unemployment and the rate of change in wages in the United Kingdom. The Phillips' (1958, p.288) analysis is summarized in the popular Phillips curve (Figure 1) to depict an inverse relationship between unemployment and inflation. Another landmark in the literature was the subsequent article by Paul Samuelson and Robert Solow (1960) that inverted Phillips' analysis to suggest that a range of 3% - 4% inflation was the necessary price of bringing unemployment down to 3% in the

United States. Samuelson and Solow represented the Phillips curve as a relationship between price inflation and unemployment rather than between wage-inflation and unemployment.

Figure 1: The Phillips Curve

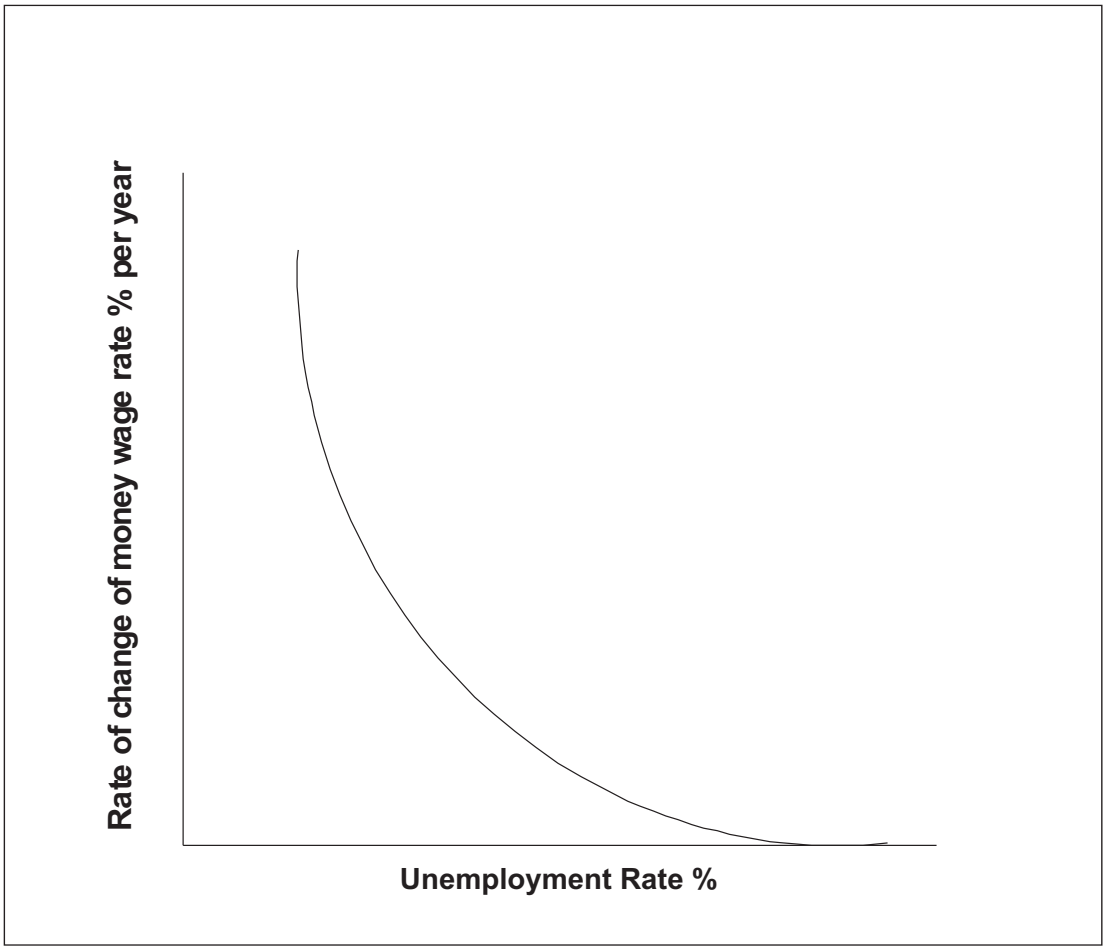


Figure 2: Transformed Samuelson-Solow-Phillips-Curve

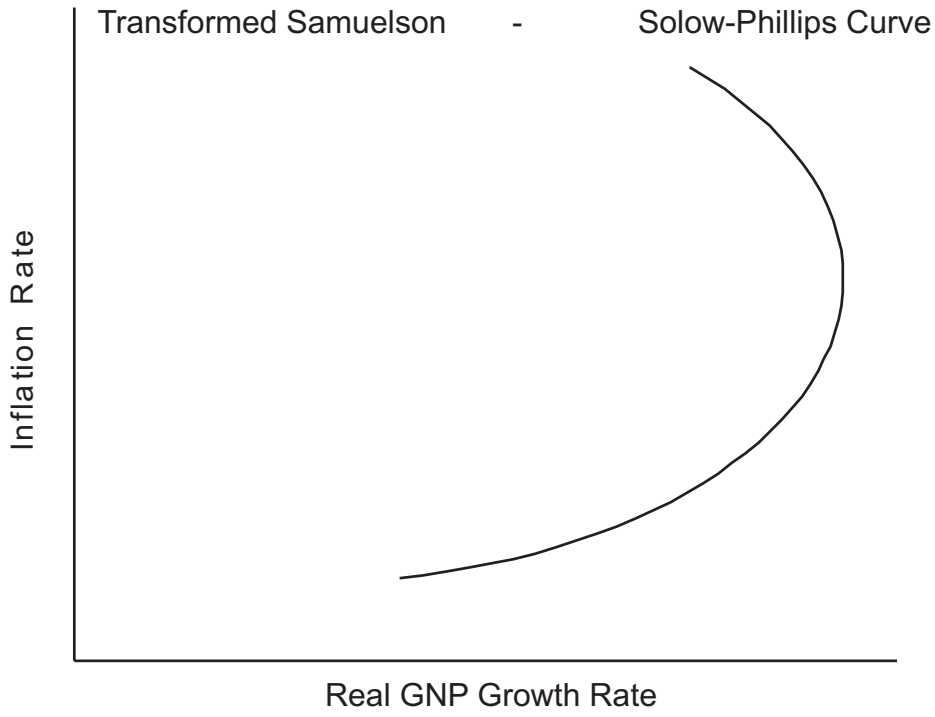


Figure 2 is the transformed Samuelson-Solow-Phillips curve. At present, the pendulum has swung in favour of the second view that stable prices are essential for growth, at least in the short run. The importance of price stability is derived from the harmful consequences of price volatility. Price fluctuation undermines the ability of policy-makers to achieve other macroeconomic objectives. Generally, price volatility dilutes the role of money as a store of value and inhibits investments and growth.

Techniques of Monetary Control

The techniques of monetary control are the monetary policy instruments. These instruments can be divided broadly into two: direct and indirect instruments.

Direct Instruments

The direct instruments of monetary policy include selective credit control, moral suasion, direct regulation of interest rates, etc.

(i) Moral suasions refer to situations when the central bank resorts to exhortation and admonition in an attempt to create the expectations and the financial climate it deems desirable and also to influence the lending operations of commercial banking system. It relies on the acceptance of the leadership role of the central bank within the monetary system.
(ii) Selective credit control involves the imposition of quantitative ceilings on the overall and/or sectoral distribution of credit by the central bank. It could also take the form of imposition of ceilings on deposits in which case, a limit is set on the amount (for instance, foreign currencies) an individual or organization can deposit into a bank account.
(iii) Direct regulation of interest rates involves fixing of deposit and lending rates ranges within which commercial banks are expected to charge.

Indirect Instruments

Indirect instruments also called traditional instruments are referred to as market weapons. They include open market operations (OMO), discount rate policy and reserve requirements.

(i) Open market operations (OMO) entail the sale or purchase of treasury bills or government securities with the aim of controlling the base money or its components which in turn influences deposit money banks' reserve balances.

(ii) Discount rate is the price paid by the owner of securities to the central bank for converting the securities into cash. It is designed to influence the cost of credit (that is, the cost at which banks can borrow from the central bank). The mechanism influences the availability of credit hence money supply in the economy. The ability of the central bank to use this policy derives from its role as lender of last resort.

(iii) Reserve requirement is designed originally to protect customers' deposits by ensuring some minimum level of bank liquidity. The reserve requirement is expressed as a percentage of customers' deposits, and it predetermines the maximum amount of credit that can be created by the banking system.

What Monetary Policy Can Do

(a) Monetary policy can prevent money itself from being a major source of economic disturbance.

(b) Monetary policy can provide a stable background for an economy. This it does by maintaining a stable price level. A stable price level into the future ensures confidence in the economic system.

(c) Monetary policy can contribute to offsetting major disturbances in the economic system arising from other sources. For instance, if the fiscal deficits resulting from explosive budget threaten an economy, monetary policy can be used to hold the inflationary dangers in check by a slower rate of monetary growth than would otherwise be desirable.

What Monetary Policy Cannot Do

There are basically two limitations of monetary policy: (a) It cannot peg interest rates for more than very limited periods; (b) It cannot peg the rate of unemployment for more than very limited periods.

How Should Monetary Policy be Conducted?

A monetary authority should guide itself by magnitudes that it can control, not by ones it cannot control. Of the various alternative magnitudes that the monetary authorities can control, the most appealing guides for policy according to Friedman (1968:15) are the price level, as defined by some index, exchange rates, and the quantity of monetary aggregates (M1 and M2). Of the three guides listed, the price level is clearly the most important as most economists have argued. However, Friedman also pointed out that the link between the policy actions of the monetary

authority and the price level is more indirect than the link between the policy actions of the authority and any of the several monetary aggregates (M1 and M2), as monetary actions for instance, take a longer time to affect the price levels. Thus given the time lag and the magnitude of the effect, Friedman suggested monetary aggregates as the best available guide.

Secondly, the conduct of monetary policy should avoid sharp swings in policy- not too late and too much. A monetary authority should be proactive but not too far and too hard. The reason to overreact seems clear: failure of monetary authorities to allow for a delay between their actions (determined by today's conditions) and subsequent effects on the economy (which occurs only six or nine or twelve or fifteen months later). This is why the step on the brake or accelerator as the case may be, may turn out to be too hard.

III Monetary Transmission Mechanism

One way of understanding how monetary policy affects the economy is through the various channels of monetary transmission mechanisms. These transmission mechanisms include interest rate effects, exchange rate effects, asset price effects and credit channel (Mishkin, 1995). These various effects or channels are explained schematically.

The Interest Rate Effect

The interest rate mechanism in the transmission of monetary policy is a key channel in the basic Keynesian textbook model. This channel has also been the mainstay of teaching in macroeconomics. Using a schematic diagram, the traditional Keynesian perception of how a monetary policy (e.g. tightening) is transmitted to the real economy can be displayed as follows:

$$M \quad i \quad I \quad Y$$

Where M? is a contractionary monetary policy which leads to a rise in domestic real interest rates (i?), this in turn raises the cost of capital, thereby causing a fall in investment spending (I?). The decline in investment spending results to a fall in aggregate demand and a decline in output (Y?). While this approach as originally emphasized by Keynes may be viewed as operating through businesses' decisions about investments, the transmission equally applies to consumer spending in which I represents residential housing and consumer durable expenditure.

Some studies that have empirically affirmed the monetary transmission mechanism via the interest rate channel despite the criticisms are Taylor (1993 and 1995) and Romer and Romer (1994). In summary, the theory posits that an increase in real interest rate raises the price of currently purchased goods and thereby reduces aggregate demand and growth.

The Exchange Rate Effect

The importance of exchange rate channel of monetary transmission has also been emphasized in the literature. This has been related to the growing internationalization and globalization of economies given the advent of flexible exchange rate regime. The exchange rate channel of monetary policy transmission operates on net exports and it inherently involves interest rate effects. The schema for the transmission mechanism operating through exchange rate is characterized as follows:

$$M \quad i \quad E \quad NE \quad Y$$

Where M? indicates a contractionary monetary policy leading to a rise in domestic real interest rates (i?). Domestic currency deposits (₦) become more attractive relative to deposits denominated in foreign currencies, thereby leading to a rise in the value of the domestic currency deposits relative to other currency deposits, that is an appreciation of domestic currency (say ₦) denoted by E?. The higher value of the domestic currency (₦) makes domestic goods more expensive than foreign goods, which results in a decline in net exports (NE?) and hence a fall in aggregate output all things being equal.

Other Asset Price Effects

Other than the financial market framework analyzed by Taylor (1995) in explaining the monetary policy transmission mechanisms on the real economy, a key objection to the Keynesian paradigm on the monetary transmission is that it focuses only on one relative asset price (interest rate). However, the use of other asset prices has also been discussed in the economic literature. These other asset prices in the transmission of monetary policy are emphasized through two channels: Tobin's q theory of investment and the wealth effects on consumption.

Tobin's q theory in the monetary transmission is through its effects on the valuation of equities and its relative link with investment spending. In Tobin (1969), q is the market value of firms divided by the replacement cost of capital (Mishkin, 1995). A

high q implies a high market price of firms relative to the replacement cost of capital and new plant. This makes equipment capital to be cheap relative to market value of business firms and as such, firms can issue equity and since the market value of business firms is high, they can get a high price relative to the cost of the plant and equipment they are buying. This will increase investment spending since they can buy a lot of new investment goods with a small proportion of the issued equity. Here lies the link between Tobin's q and investment spending.

Assuming q is low; firms will not purchase new investment goods since their market value is equally low, relative to the cost of capital. Rather, they can acquire another firm cheaply or acquire old capital instead. How then does monetary policy affect equity prices?

In the monetarist paradigm, a fall in the supply of money leads to decreased spending since the public finds it has less money, as he demands. In such situation, the public reduces its spending in the stock exchange and thereby a decline in demand for equities. Lower equity prices (P q) will lead to a lower q (q?), thus a decline in investment spending (I?) and hence aggregate output (Y?).

$$M \qquad Pq \qquad q \qquad I \qquad Y$$

The second approach of the monetary transmission through equity prices is the wealth effects on consumption. Modiglani (1971) is one of the strongest advocates of this approach. According to this channel, lifetime resources of the consumer determine consumption spending. These lifetime resources are real capital, human capital and financial wealth. Common stocks constitute a major component of the financial wealth. A fall in stock prices leads to a decrease in the value of financial wealth, which ultimately decreases the lifetime resources of consumers, and consequently a decline in consumption and output. This alternative transmission mechanism schematically begins with a contractionary monetary policy that lowers investment spending:

$$M \qquad Pq \qquad W \quad C \qquad Y$$

Where Pq is equity prices, W is wealth, C is consumption while M and Y are as previously defined.

Price Level Effect

An alternative channel of monetary transmission mechanism is the unanticipated

price level effect. Although economists generally disagree on the role of money in stabilizing prices; changes in supply of money and the price level are strongly correlated (Akinlo, 2007). This correlation has its roots in the original formulation of the quantity theory of money.

An unanticipated rise in the general price level due to monetary expansion lowers the value of firms' liabilities in real terms (debts are contractually fixed in nominal terms). This raises the net worth of firms and subsequently, a reduction in adverse selection and moral hazard problems which encourages a rise in investment and output. Schematically, this is displayed as:

M? ? unanticipated P? ? adverse selection? ? moral hazard? ? lending? ? I? ? Y?

Credit Effect

One new view on the monetary transmission mechanism which emphasizes how asymmetric information and costly enforcement of contracts creates agency problems in financial markets is the credit paradigm. The credit paradigm of monetary transmission is discussed under the ebb of bank lending and balance-sheet channels.

The bank lending channel is based on the view that banks by their peculiar nature are best suited to deal with some categories of borrowers (small firms) where problems of asymmetric information is more pronounced. Under this channel, a contractionary monetary policy (M?) leads to a fall in bank reserves and bank deposits (BD?) and consequently leads to a decline in bank loans (BL?). A fall in bank loans as a result of declining bank deposit affects borrowers which inevitably causes decline in investment spending (I?), thereby leading to a fall in output (Y?)

M BD BL I Y

The balance sheet approach operates through the net worth of business firms. A decrease in business firms' net worth leads to a decrease in lending (investment projects of firms with lower net worth are perceived as riskier) as lenders are not likely to be paid back and hence a decline in investment spending. But how does monetary policy affect firms' balance sheet?

According to Mishkin (1995), a contractionary monetary policy (M?) causes a decline in equity prices (Pq?) as previously demonstrated. A fall in equity prices of

firms lowers their net worth and so results in lower investment spending (I?) and thereby aggregate demand and fall in output (Y?). This is schematically displayed as:

M Pq adverse selection and moral hazard lending I Y

IV Evolution and Development of Monetary Policy in Nigeria

The objectives of monetary policy in Nigeria are much the same as discussed previously (high employment, stable prices, balance of payments equilibrium and rapid growth). With the establishment of the Central of Nigeria (CBN) in July 1957, the stage was set for a new era in which monetary policy could be used as instrument of economic management (Teriba, 1976). The major task of this section is to describe the changing emphasis on these objectives.

The Formative Years, July 1959 - March 1962

Prior to 1964, it has been argued, that no conscious monetary policies were implemented in Nigeria as the operations of the CBN did not start until July 1959. In March 1962 following the launching of the country's Second National Development Plan (1961-1964), the CBN was brought into limelight of development financing. Monetary issues of concern (since the country was using the currency of the West African Currency Board) were the establishment of a strong financial base and the promotion of domestic financial infrastructures such as the money and capital market institutions and instruments (Gbosi, 1993:266). Notable actions taken during this period included the issuance of the Nigerian currency, introduction of the first Nigerian money market instrument the Treasury Bill, establishment of the Nigerian Stock Exchange, etc. The most active policy instrument during this period was the interest rate. For instance, between April, 1960 and December 1960, the discount rate and treasury rate were raised 10 and 13 times, respectively. The aim of the Treasury bill was to encourage commercial banks to repatriate short-term funds from London.

The Period 1962 - 1975

The first era of this period witnessed the Amendment Act of 1962 that strengthened the Central Bank for effective monetary policy promotion. Cheap monetary policy was adopted during this first era to enable the government borrow as cheaply as possible for the purpose of financing the Second National Development Plan.

During the period 1964-1966, monetary policy was targeted at defending the balance

of payments given the rapid credit expansion experienced in this period, which encouraged increased demand for imports and subsequent drain on foreign reserves. Monetary policy instruments used during this period included fixing the exchange rate, interest rate, discount rate control, variable liquid assets and moral suasion to reverse the credit expansion.

Owing to the civil war in 1970, the Nigerian economy experienced an inflationary spree. Other factors that fueled inflation were the unrealistic wage increase awarded by the Adebo and Udoji Commissions in 1971 and 1974, respectively. Consequently, inflation became the most serious problem in Nigeria. The Central Bank to this effect embarked on some direct control measures. This included encouragement of commercial banks to channel a greater and increasing percentage of their credit allocation to productive sectors of the economy (Ajayi and Ojo, 1979). Other measures were targeted at reducing the liquidity of commercial banks and issuance of 'stabilization securities'. Under this scheme, the CBN was given powers to sell or allocate these securities to, or repurchase them from any banking institution (Gbosi, 1993).

The Period 1975-1992: Direct Control Era

This period has been abruptly described as the direct control era. The major objective of monetary policy during this period was to promote rapid and sustainable economic growth. To this end, the monetary authority imposed quantitative interest rate and credit ceilings on the deposit money of banks and sustained the sectoral credit allocation policy to 'preferred' sectors (agriculture, manufacturing, and residential housing) and less 'preferred sectors' (imports and general commerce, and “others”). This classification as explained by Nnanna (2001:5) enabled the monetary authorities to direct financial resources at concessionary rates to sectors considered as priority areas. These rates were typically below the CBN minimum rediscount rate (MRR), low and not determined by market forces.

The CBN also compelled banks to deposit with it (special deposit) any shortfall in the allocation of credit to the designated preferred sectors. However, this policy of direct control in the allocation of credit to the priority sectors did not meet the prescribed targets and failed to impact positively on investment, output and domestic prices. As further observed by Nnanna (2002: 9), banks' aggregate loans to the productive sectors between 1972 and 1985 averaged 40.7 percent to total credit, about 8.7 percentage points lower than the stipulated target of 49.4 percent.

The period of the 'Control Regime' equally experienced an impaired effectiveness of monetary policy. One major factor often cited was lack of instrument autonomy of the Central Bank as the Ministry of Finance influenced by short-term political considerations largely dictated monetary policy. Empirical evidence as cited in Nnanna (2002) on the works of Fisher (1994) and Ojo (2000) support the goals of central banks' autonomy. Instrument autonomy of central banks (CBs) is predicated on the strong influence CBs have on monetary management and their ability to achieve monetary policy objectives.

In 1987, the monetary and credit policy measures adopted were designed to facilitate the achievement of the goals of the Structural Adjustment Programme (SAP). The adoption of SAP was as a result of harsh and severe economic difficulties in 1985. The SAP programme was aimed at reforming and dismantling the control regime and the enhancement, promotion and use of indirect instruments of monetary controls. This ushered in the current monetary policy framework.

The Period of Indirect Instrument of Monetary Control (1993-Date)

The era began with the removal of selective credit ceilings for banks beginning in September, 1993 following the promulgation of the CBN Decree 24 and the Banks and Other Financial Institutions Decree (BOFID) 25 of 1991. In 1998 Decree Numbers 37 and 38 of the CBN (Amendment) and BOFID (Amendment) were promulgated. Overall, the CBN Act was amended and the Bank granted more discretion and autonomy in the conduct of monetary policy.

The monetary policy framework of indirect controls involved the use of market instruments, particularly the Open Market Operations (OMO) introduced at the end of June 1993 and is conducted wholly on Nigerian Treasury Bills (TBs), including Repurchase Agreements (REPOS). The OMO is complemented with the use of reserve requirements, the Cash Reserve Ratio (CRR) and the Liquidity Ratio (LR). The CRR has been progressively increased from 6 percent in 1995 to 12.5 percent in April, 2001. In 2005 there was an upward adjustment of the CRR by a total of 150 basis points and subsequent reduction.

The Minimum Rediscount Rate (MRR) was also used by the CBN as a nominal anchor to influence the level and direction of other interest rates. The changes in the rate indicated whether the monetary authorities wished to adopt a policy of monetary tightening or otherwise. The rate was 16.5 in December 2002, 15 percent in June 2004, 13 percent in December 2005 and 10 percent in December 2006.

In recent times, the CBN has been committed to ensuring price and exchange rate stability through restrictive monetary policy stance. This it has done with the introduction of the Wholesale Dutch Auction System (WDAS) and non-discountable Special Nigerian Treasury Bills (NTBs). In 2006, the CBN also introduced a new monetary policy implementation framework which establishes an interest-rate corridor of three percentage points above and below a short-term Monetary Policy Rate (MPR). The MPR fixed at 10 percent in 2006 was reduced and retained at 8.0 percent in August 2007. Consequently, the annual headline inflation rate which averaged 17.9 percent in 2005 stood at 8.4 percent in 2006. Inflation stayed within single-digit of 6.4 percent in the first half of 2007. The exchange rate on the other hand has also faired well relatively. Apart from a drop in the market premium in the first week of June 2006 from ₦24 to ₦9.00, the naira exchange rate appreciated from US$1/₦151 in March 2006 to US$1/ ₦126.88 at end-March 2007 and to US$1/ ₦126.05 at end-June, 2007 (Central Bank of Nigeria Communiqué of the Monetary Policy Committee: various issues).

Assessment of Effects: An Alternative Consideration

This sub-section is a performance assessment of the current monetary policy in Nigeria (1995-2006). Following the lead by Nnanna, (2001), Tables 2 and 3 provide data on the extent to which actual growth in monetary aggregates, GDP growth rate and inflation, approximate the ex-ante policy targets.

Money and Credit

The post-reform period under review witnessed a substantial growth in money supply. Money supply (M_1) grew rapidly from 16.3 percent in 1995 to 62.2 percent in 2000, while M_2 grew from 19.4 percent in 1995 to 48.1 percent in 2000. These growth rates during this period were due to the rapid monetization of oil flows and financing of government fiscal deficits through the banking system. For instance, aggregate credit (net) increased from 7.4 percent to 64.6 percent in 2002, although negative growths were recorded in some of the intervening years in between.

Between 2001 and 2006, the growth of M_1 consistently over-shot its target except in 2004 when the outcome of 8.5 percent growth was below the 10.8 percent target. Base money, the Central Bank's operating target for monetary policy, at ₦918.9 billion, was far in excess of the end-December 2006 Policy Support Instrument (PSI) target ceiling of ₦820.0 billion.

The provisional data also indicated that broad money (M_2) grew by 30.6 percent, compared with the maximum target of 27.8 percent for fiscal 2006. The rise in money stock was attributable wholly to the significant increase in the foreign assets (net) of the banking system arising from the sustained increase in crude oil prices in the international oil market. Aggregate credit to the domestic economy according to the 2006 Annual Report of the CBN, fell by 65.0 percent. This also reflected wholly the substantial fall in credit to the Federal Government by 676.2 percent, compared with a programmed decline of 40.0 percent in fiscal 2006.

Credit to the private sector rose by 26.6 percent as against the programmed target of 22.0 percent in 2004, while a similar feat was also achieved in 2005 as credit to this same sector (private) increased by 29.3 percent as against the set target of 22.0 percent. Credit to the private sector rose by 28.2 percent, comparing favourably with the target of 30.0 percent.

Generally, fiscal dominance has relatively been on the decline since 1998, but the decline has not been consistent. For example, while a 4.3 percent, 5.5 percent and 2.8 percent declines were recorded in 2001, 2002 and 2003, respectively, increased spending was once again recorded in 2004 and 2006. This undermines the efficacy of monetary policy.

Domestic Output

Generally speaking, output performance has been impressive. Growth outcome on the average compared favourably with the set targets. Unprecedentedly, in the post-reform period, an outcome of real growth at 10.2 percent was achieved as compared with a programmed target of 5.0 percent in 2003. Furthermore, the period between 2004 and 2005 witnessed outcomes of growth in real GDP over their set targets. However, real growth GDP of 5.6 percent in 2006 lagged behind a projected target rate of 7.0 percent during the same period.

Price

As rightly noted by Nnanna (2001), the major objective of monetary policy in Nigeria is the maintenance of macroeconomic and price stability. A single-digit low and stable inflation rate (also one of the conditions for the establishment of the second West African Monetary Zone) constitutes the price stability objective as perceived in the Nigerian context. Persistent single-digit inflation has not been sustainably achieved in Nigeria. For instance, for the 12 year period (1995 to 2006), a single-

digit inflation rate, was achieved only 4 times, though recent years experience (that is since 2004) has been relatively satisfactory. The year-on-year data revealed that the outcome of actual inflation rate has been favourable compared with the programmed targets. This may imply a relative success of monetary policy since 2004. These latter periods of favourable comparison between outcome and target can also be adduced to time-lag effect of the efficacy of monetary policy.

Figure 3: Selected Macroeconomic Variables

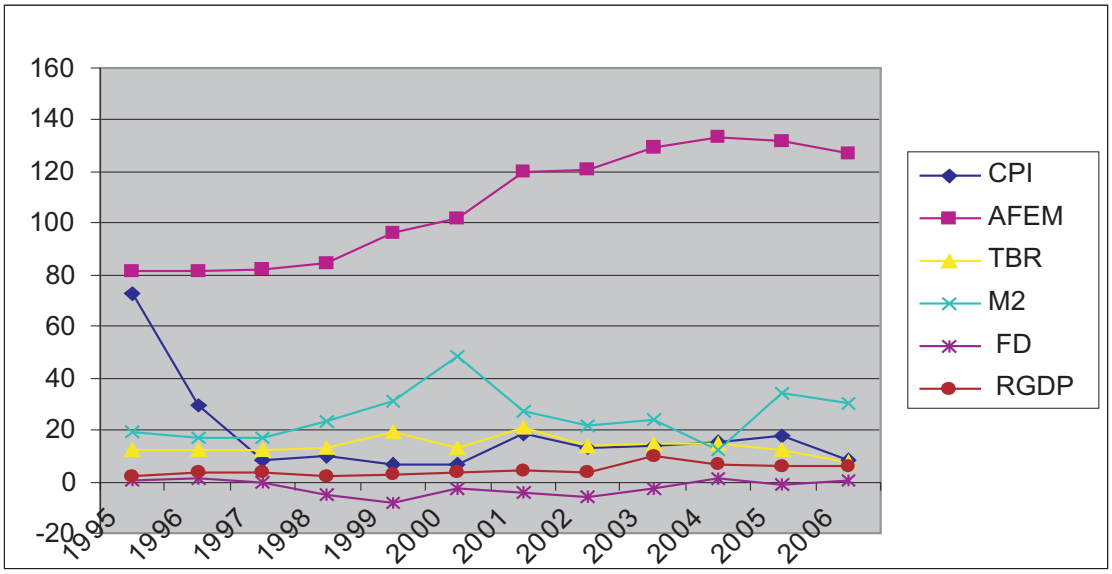
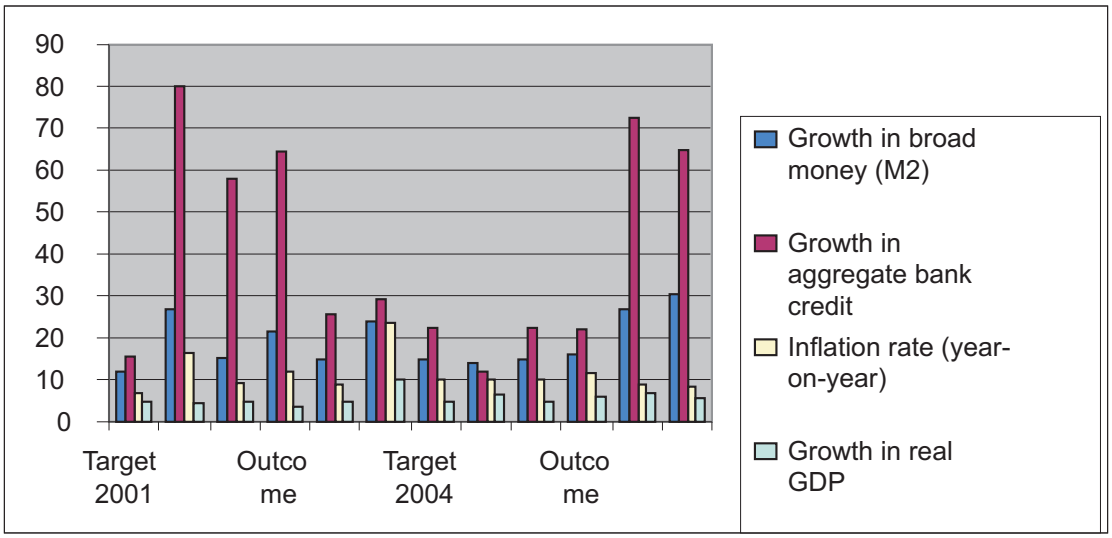


Figure 4: Outcome and Targets of Monetary Aggregates, Inflation and Real GDP (%)



Constraints of Monetary Policy in Nigeria

Monetary policy framework in Nigeria has been targeted at the enhancement of output and a sustainable price level. Despite the efforts and determination especially on the part of the CBN, some constraining factors still inhibit the efficiency of monetary policy in Nigeria. These include:

Fiscal dominance: Fiscal expansion results in fiscal deficits. In Nigeria, such deficits in recent years were financed mostly by banking sector credit. This does not only result in crowding-out of the private sector, it also fuels inflation. It is thus difficult to explain a situation where monetary policy was targeted at combating inflation and at the same time, government embarks on budget deficits (via extra budgetary expenditures). In a situation like this, monetary policy becomes impotent.

Liquidity overhang, which is also related to fiscal dominance. Liquidity overhang in Nigeria results from the monetization of oil receipts including the

excess crude proceeds especially since 2000, the population census in 2006 and pre-election spending in early and mid-2007. Other sources are the fiscal operations of the states and local governments whose 'loose' expenditures seriously inhibit the ability of the CBN to control the money supply.

The lack of timely and accurate data needed for effective monetary policy formulation. Although, some improvements are already being recorded in the form of large scale computerization of the financial system and the collaborative efforts of the CBN as well as the rebirth of the National Bureau of Statistics (formerly Federal Office of Statistics), improvement in collection, collation and publication of high frequency, reliable, and micro-level data is still needed.

The large informal sector in Nigeria also implies the existence of a large informal credit market. This has some implications for the transmission mechanism of monetary policy. For instance, the money creation ability of the informal credit market is a constraint on the CBN ability to control money supply in the economy.

The preferred payment instrument (cash) in Nigeria. The literature has shown that a system that is driven by cash payments is inefficient and as such distorts the transmission mechanism of monetary policy (Nnanna, 1999).

Inconsistency in monetary policy announcements. Most recent is the suspension of the proposed currency re-denomination programme. Complementary to this is the increasing involvement of the Nigerian government in setting the goals, while the Central Bank manages the instrument to achieve the goals. What this implies is that the Central Bank of Nigeria possesses instrument independence (which is still weak) but not goal independence.

V Conclusion

The paper has attempted to address some of the conceptual and theoretical issues of monetary policy in a broad and wide setting manner. In the course of its preparation, the need to domesticate the framework of monetary policy issues was not undermined. Consequently, some of the broad conclusions from the paper can be summarized as follows:

Monetary policy is one of the economic policies available to nations aimed at achieving macroeconomic objectives.

Monetary policy cannot peg interest rates and rate of unemployment for more than very limited periods.

Directing monetary policy solely at achieving stable prices is essential for economic growth and development.

Monetary policy should guide itself by the magnitudes it can control and should avoid sharp swings.

The various channels of monetary transmission mechanisms are interest rates, exchange rate, asset price etc.

Fiscal dominance inhibits monetary policy effectiveness.

In conclusion, the paper posits that the current CBN Act (Amended) be further amended to provide adequate independence. Moreover, the Nigerian experience has also shown that the effectiveness of monetary policy in the economic development process of an economy must be anchored beyond it and be complemented to some extent, by other economic policies. This notwithstanding, it permits the following unconventional style in concluding this paper on price stability and maximum sustainable economic growth.

"I find computers a bit mysterious, and I know that many think that monetary policy is even more mysterious. Federal Reserve officials used to delight in adding to the mystery,...macroeconomic theory has made clear the importance of central bank... to an effective monetary policy". William Poole (2006:155).

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Appendix

Table 1: Data on Aggregate Credit to Priority Sectors 1980 - 1992

Year	Agric, Forestry and Fishery	Manufacturing	Total Credit to Priority Sectors	Total Credit
1980	462.2	1956.8	2419	6349.1
1981	590.6	2659.8	3250.4	8582.9
1982	786.6	3037.6	3824.2	10275.3
1983	940.4	3053.1	3993.5	11093.9
1984	1052.1	3083.5	4135.6	11503.6
1985	1310.2	3232.2	4542.4	12170.2
1986	1830.3	4475.2	6305.5	15701.6
1987	2427.1	4961.2	7388.3	17531.9
1988	3066.7	6078	9144.7	19561.2
1989	3470.5	6671.7	10142.2	22008
1990	4221.4	7883.7	12105.1	26000.1
1991	5012.7	10911.3	15924	31306.2
1992	6978.9	15403.9	22382.8	42736.8

Source: Central Bank of Nigeria (1998) Statistical Bulletin Vol. 9 No. 1

Table 2: Selected Monetary Indicators

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
(1) Domestic Prices (%) i) Inflation Rate (CPI) (Moving Averages	72.8	29.3	8.5	10.0	6.6	6.9	18.9	12.9	14.0	15.1	17.8	8.3
ii) AFEM Exchange Rates (Averages) NUS (1 $)	81.2	81.2	82.0	84.4	96.1	101.7	119.9	121.0	129.4	133.5	131.7	127a
iii) Interest Rates (Averages) (a) Call rates (Interbank)	20.5	12.5	18.2	15.02	16.1	12.18	12.7	12.7	21.11	12.14	7.00	8.98
(b) CBN Treasury Bill Discount Rate	12.5	12	12	13	19	13	20.5	13.8	14.5	14.4	12.5	7.3
(c) CBN MRR	13.5	13.5	13.5	13.5	18	14	20.5	16.5	15.0	15.0	13.0	10.0
(d) Savings Deposit Rates (CBs)	12.6	10.1	6.12	5.22	5.3	4.9	5.0	3.7	3.2	4.4	3.3	3.3
(e) Prime Lending Rates (CBs)	20.2	19.1	18.4	18.26	21.3	21.25	26	20.6	19.6	18.9	17.8	17.3
(f) Maximum lending Rates (CBs)	20.8	20.8	20.9	21.84	27.2	26.6	31.20	25.7	21.6	20.4	19.5	18.7
(2) Money and Credit (%) i) Money supply (M_2)	19.4 (10.1)	16.8(16.8)	16.9(15.0)	23.3(15.6)	31.0(10.0)	48.1(14.6)	27.0	21.55	24097	12.28	34.61	30.56
ii) Money supply (M_1)	16.3(9.4)	14.5(14.5)	18.2(13.1)	20.5)10.2)	18.0)4.1)	62.2(9.8)	28.06	15.86	29.52	8.6	29.7	12.25
iii) Credit (a) Aggregate Credit (net)	7.4(11.3)	- 23.8(24.8)	-2.8(24.8)	46.8(24.5)	30.1(18.3)	-23.1(27.8)	79.87)	64.60	35.7	120	14.5	67.42
(b) Credit (net) to govt.	-9.5(5.6)	-55.6(0.0)	-53.5(0.0)	144.9(0.0)	32.0(10.2)	- 162.3(37.8)	95.16	6320.6	58.43	-17.9	-37.0	-626.10
(c) Credit to the private sector	48.0(21.7)	23.9(29.5)	23.9(45.4)	27.4(33.9)	29.2(19.9)	30.9(21.9)	43.46	19.74	26.81	26.6	30.8	27.82
(iv) Fiscal Deficit (% GDP)	0.1	1.3	-0.2	-4.7	-8.4	-2.9	-4.3	-5.5	-2.8	1.5	-1.1	0.6
(v) Average OMO sales	0.16	0.23	1.9	1.5	7.92	7.73		49,332.4	66,220.6	91,620.5	82,486.7	150,701.7
(vi) Average OMO Bids	0.18	0.25	2	1.6	7.92	7.55		54,696.5	77,046.3	94,678.3	103,943.3	189,183.3
(3) Domestic Output (%) a) Real GDP Growth	2.2(4.2)	3.3(5.0)	3.2(5.5)	2.4(4.0)	2.8(3.0)	3.8(3.0)	4.6	3.5	10.2	6.5	6.2	5.6
b) Agriculture	3.38	3.69	4.1	3.5	3.3	3.1		4.22	6.64	6.50	7.06	7.17
c) Industrial production	-0.31	2.87	0.8	1.6	1.4	-0.8		-3.75	21.26	4.15	1.71	-2.61
d) Capacity utilization	29.3	36.8	34	34.9	36	34.5	39.6	54.9	56.5	55.7	54.8	

Source: Central Bank of Nigeria Annual Report and Statement of Accounts (Various Years).

Table 3: Key Policy Targets and Outcomes (in per cent)

	2001		2002		2003		2004		2005		2004	
Monetary Aggregates	Target	Outcome	Target	Outcome	Target	Outcome	Target	Outcome	Target	Outcome	Target	Outcome
Growth in base money	***	34.9	15.3	14.0	19.6	19.8	12.8	5.2	6.5	10.2	7.5	20.5
Growth in broad money (M2)	12.2	27.0	15.3	21.6	15.0	24.1	15.0	14.0	15.0	16.2	27.0	30.6
Growth in narrow money (M1)	4.3	28.1	12.4	15.9	13.8	29.5	10.8	8.6	11.4	15.9	7.9	20.3
Growth in aggregate bank credit	15.8	79.9	57.9	64.6	25.7	29.1	22.5	12.0	22.5	21.9	72.3	65.0
Growth in bank credit to government	2.6	95.2	96.6	6320.6	150.3	58.4	29.9	-17.9			40	-670.2
Growth in bank credit to private sector	22.8	43.5	34.9	19.7	32.3	27.1	22.0	26.6	22.0	29.3	30.0	28.2
Inflation rate (year-on-year)	7.0	16.5	9.3	12.2	9.0	23.8	10.0	10.0	10.0	11.6	9.0	8.5
Growth in real GDP	5.0	4.6	5.0	3.5	5.0	10.2	5.0	6.5	5.0	6.2	7.0	5.6

Source: Central Bank of Nigeria Annual Report and Statement of Accounts (Various Years).

Exchange Rate versus Capital Account Liberalization in Nigeria: Some Important Issues

*A. E. Akinlo and D. O. Yinusa**

I. Introduction

The role of money in initiating and transmitting macroeconomic fluctuations remains a question dividing opinions in the economics profession. Money and economic fluctuations are closely associated as are money and price level changes. These economic movements are often referred to as the business cycle-the general fluctuations around a trend rate of aggregate output, employment, and the rate of inflation. Indeed, few economists will question the long-term association between money and economic growth. But economists will disagree over the interpretation of these data. Monetarists argue that excessive changes in the rate of money supply are the primary causes of the business cycle. Many Keynesian economists not only dispute this claim but argue instead that changes in the growth of monetary aggregates result in response to changes in the level of economic activity (Dalgaard, 1987).

Economists also disagree over the degree to which money influences output and prices. Changes in the supply of money and changes in the price level are strongly correlated. The correlation between these changes was originally formulated years ago as the quantity theory of money. At this point, it is clear that connection exists between money, output and prices. As such, the question "does money matter?" has, of late at least, been replaced by the question "how much does money matter?" The recognition that "money matters" still does not resolve the issue of the direction or magnitude of the relationship between money and the economy. It is really an empirical issue. As such, there have been a number of approaches that have been used for the purpose of evaluating the effects of money on output and prices in a typical

**This is a revised version of the paper earlier presented at the seminar. The title of the paper has also been modified.* *Anthony E. Akinlo (Ph.D) is Professor of Economics & Director, Centre for Industrial Research and Development (C.I.R.D),Obafemi Awolowo University, Ile-Ife, Nigeria while Dauda O. Yinusa (Ph.D) is of the Department of Economics, Obafemi Awolowo University, Ile-Ife, Nigeria.* *The views expressed herein do not represent the views of the institution to which the authors are affiliated or those of the Central Bank of Nigeria. The authors acknowledge the comments and suggestions of anonymous reviewers.*

developing economy like Nigeria[1]. This study has become so important because an understanding of this relationship will help monetary policy design and management in a fast changing world. Also, the need for continuous research into this subject is also highlighted by the reliance on monetary policy as the principal tool for economic stabilisation in emerging market economies. Inflation and output fluctuations in developing economies provide the occasion to re-examine alternative theories in the context of fast-changing economic and social institutions. As monetary management in these economies used to be the residual component of central planning, achieving a better understanding of the interactions between money and other macroeconomic variables is all the more imperative.

However, of all the prices in the economy, the exchange rate seems to occupy a very strategic position by virtue of its role in linking a small open economy with the rest of the world. As such, prominent attention will be given to brief but insightful review of exchange rate management in Nigeria. Also, an attempt will be made to evolve operational framework for fuller exchange rate liberalization and management, with suggestions about pace and sequencing of exchange rate liberalization in Nigeria.

II. Money-Output-Price Nexus-Some Theoretical Views

The essential role of money as the fundamental determinant of the price level can be established in the context of a microeconomic general market-equilibrium framework and a stylised consensus macroeconomic model. At a microeconomic level, and under certain plausible and rational assumptions concerning agents' preferences and optimising behaviour, the conditions for equilibrium in the product, services, labour and asset markets determine the relative prices of goods and services, the real wage (in terms of a general price index), and the spectrum of the relative real rates of return on all assets, including the associated risk premia. The determination of the general price level, and its rate of change, requires control of the nominal quantity of base money or of some other monetary aggregates that can be effectively controlled by the central bank. This result reflects the role of money both as a medium of exchange and as a unit of account. Under price and wage flexibility, and in the absence of any nominal rigidities, the price level will promptly and fully respond to a change in the money stock. More generally, the determination of the price level by the nominal quantity of money will be established in the long-run equilibrium. At an aggregate, macroeconomic level, the fundamental proposition

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[1] *Walsh (2003) has an excellent review of the various approaches that have been used to model the relationship between money, output and prices in various economies covering different time dimensions.*

concerning the link between the supply of money and the price level is captured by the quantity theory of money (Papademos, 2006).

The different views about the role of money in output and price fluctuations in developing countries could be classified into four. The first view doubts the existence of a systematic relationship among money, output and prices in developing economies. It argues that many factors could be disruptive to money demand, for example the release of the monetary overhang caused by quantity-rationing in the regulated era, households' enhanced motive for precautionary saving, monetisation and re-monetisation of some economic transactions, and increased financial sophistication. Consequently, even if money does influence output and prices, the relationship would not be sufficiently stable to be exploitable by monetary policy. This argument may explain why many developing and transition economies opted for exchange-rate-based stabilisation instead of money-based stabilization (Zhang and Wan, 2004).

The second view holds that the major difficulty in targeting monetary aggregates in developing and transition economies arises not from the instability of money demand, but from the endogeneity of money (Peebles, 1991; Development Research Institute, 1995; Chang and Hou, 1997). Setting up quantity targets is pointless when the government lacks effective means or political will to achieve them. This does not imply, however, that monetary aggregates should be consigned to oblivion. Rather, money contains information about output, prices and other determinants of money demand. As monetary data are relatively easier to collect, changes in monetary aggregates should be monitored and fed into the formulation of fiscal, income, interest rate and exchange rate policies.

Proponents of the third view refer to the fact that prior to financial liberalization; developing countries' financial system was dominated by state banks (Bennett and Dixon, 2001). Most firms, particularly state-owned enterprises (SOEs), rely on bank credits to finance investment or even working capital. Therefore, monetary policy impacts directly on aggregate demand and supply via bank lending. Its effects on prices are uncertain due to the non-monetary causes of inflation such as relative price realignment, price reform, fluctuations in grain prices, currency devaluation, and so on.

By contrast, the fourth view disputes the link between money and real activity. It claims that certain institutional features of the Nigerian economy, such as

government commitment to supporting the SOEs, make it possible for firms to circumvent financial constraints (Wang, 1991; Brandt and Zhu, 2000, 2001). Hence, changes in money supply will largely affect prices rather than real activity.

The studies attempting to estimate the demand function of real balances embody the fifth view. Implicit in this argument is the monetarist view that changes in money lead, on a one-to-one basis, to changes in prices in the same direction. Money may affect real output temporarily. In the long run, real output tends towards its 'natural' level which is determined by the amount of labour, capital, natural resources, technology and institutions, yet independent of the stock of money.

To assess the extent to which the competing views are borne out by reality, it is desirable to use a framework of sufficient generality to encompass all the alternatives. This would ensure the comparability of the testing results. A suitable vehicle is the equation of exchange, $MV \quad PT$, where M is the stock of nominal balances, V is the velocity of circulation, T is the amount of total transactions, and P a price index of T . The logarithmic form of the exchange equation is

$$m \quad v \quad p \quad t \qquad \text{.....(1)}$$

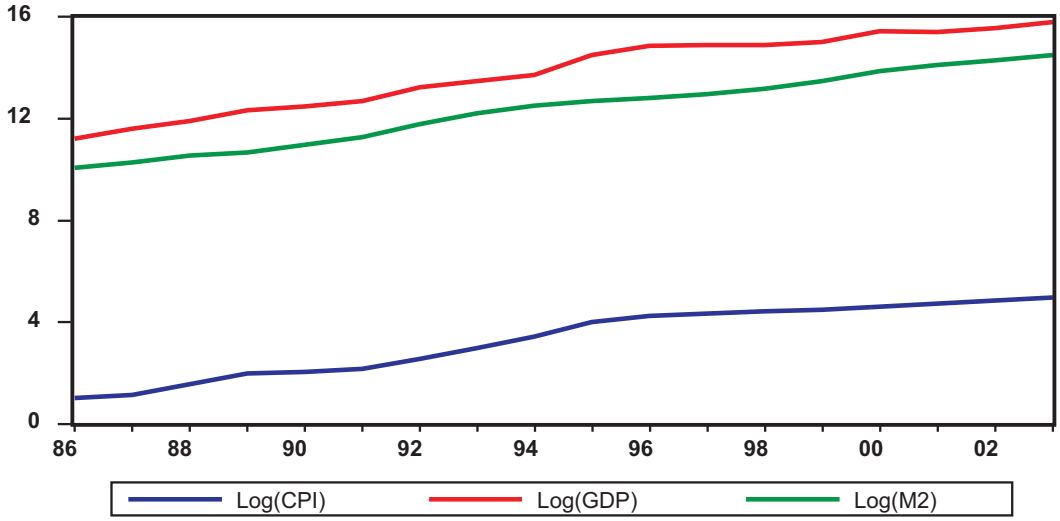
where the lower case letters represent the logarithms of the variables denoted by the corresponding upper case letters. Although an *ex post* identity, equation (1) can be turned into stylised representations of views 2 to 5 when supplemented with causal assumptions. Before the transformation can be done, however, three modifications to the equation are necessary: (i) Total transactions need to be replaced by a measure of final output, since it is the latter that is of more interest to policy decisions. As there is no obvious reason that the ratio of total output to total transaction will stay constant, the coefficient on may not be unitary. (ii) As a store of value, money competes with other forms of asset. The rate of return on alternative assets may bear significantly on velocity if money can be easily substituted for by the other assets. Therefore, a nominal interest rate that proxies for the opportunity cost of holding money should be included in the monetary equilibrium relationship. (iii) Price-money homogeneity is routinely pre imposed in previous studies about money demand. Since the factors affecting prices did not coincide exactly with those affecting money, the validity of this claim needs to be verified. Thus, the coefficients on money and prices should not be restricted to be equal as in equation (1). With these modifications, equation (1) becomes

$$m \quad a_3 i \quad a_1 y \quad a_2 p \qquad \text{.....(2)}$$

where i is the nominal interest rate. Equation (2) can now be used as the framework for turning the alternative views into structural models. The necessary condition for the first view to hold is the absence of a stable relationship among the four variables in equation (2). Should such a relationship exist, equation (2) adequately describes the monetary equilibrium. Adding different behavioural assumptions to the equation yields four stylised monetary models, each corresponding to one of the remaining views. The view of endogenous money implies a model where the supply of nominal balances adjusts to meet the demand for nominal balances.

The amount of money in existence is determined by the level of real output, prices and velocity (which in turn is influenced by the nominal interest rate). The model representing the third view is similar to the naïve LM model: prices are rigid; the stock of money is exogenously determined by money supply; changes in money supply affect real output. According to the fourth view, the effects of changes in money supply fall primarily on prices. It is thus essentially a hypothesis about the determination of prices. A representation of this view can be obtained from equation (2) by making prices the endogenous variable. The fifth view rests upon three assumptions exogenous money, endogenous prices and the proportionality between money and prices. Restricting the coefficient on price to unity and making real balances the dependent variable changes equation (2) into a model for the fifth view.

Fig. 1: Evolution of Money, Output and Prices in Nigeria



Clearly, the empirical relevance of these models would vary with the time horizon of investigation. For example, endogenous variables may anticipate as well as respond to changes in exogenous variables. Such interactions complicate the short-run temporal ordering of changes in exogenous and endogenous variables. Investigations focusing on the short-run may end up with supporting evidence for several views. Furthermore, some of the implications of the five views are more tenable in the long-run. Because the adaptation of expectations and adjustment of prices take time to complete, short-run investigations may fail to detect any stable link among the variables even though an equilibrium relationship does exist. By the same token, the price-money homogeneity postulated by view 5 may only be discernible in the long-run. A proper empirical evaluation of what the observed relation between money, prices and output means causally, therefore, necessitates differentiating between the short-run and the long-run.

At the empirical level, a first and important finding is that there is strong and robust evidence concerning the long-term relationship between money and prices, based on data collected for many countries and over long periods of time. McCandless and Weber (1995), Odusola and Akinlo (2001) and Akinlo (2006) find that the correlation between inflation and the growth of money is close to 1, varying between 0.92 and 0.96, depending on the definition of money used, as suggested by theory. The existence of a strong and stable long-term relationship between inflation and money growth is documented by many other studies, including a number of major studies on Nigeria. It is also interesting to note that the relationship between inflation and money growth is particularly close for high-inflation countries (Walsh, 2003). These findings are, of course, important and consistent with theory. But because robust correlations and long-term relationships need not imply causality, and because we are also interested in the links between money and prices over shorter time periods, we have to examine other types of evidence.

One approach employed in recent empirical studies to study the impact of monetary phenomena on the economy is based on vector autoregressions (VARs)[2], which were pioneered by Sims (1972, 1980) and further developed and extensively applied by Christiano and his colleagues. This approach has the merit that it is not constrained by a particular specification of the underlying structural relationships, and it provides evidence on the intertemporal response of the price level and output to a change in the monetary policy stance.

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[2] *Among the excellent recent application of this methodology are Leeper, Sim and Zha (1996), Christiano, Eichenbaum and Evans (1999), King and Watson (1996).*

III. Role of the Foreign Exchange Markets

Foreign exchange markets have the role of facilitating and channeling the flow of currency between prospective buyers and sellers of foreign currency. It is an important market not only because of its role in linking a small open economy with the rest of the world, but because of the effects of the developments in this market in influencing macroeconomic outcomes in the economy. This raises the issue of whether to fix or float a currency. Indeed, adopting fixed exchange rates is an extreme where countries must give heavy weight to the foreign exchange market in setting domestic macro policy even in the short-run and 100% weight over the longer term. Extreme opposite of virtually ignoring the exchange rate in setting domestic macro policy should apply only to the largest most closed economies (Willett, 2001). In between the extremes, the smaller and more open the economy, and the greater the degree of dollarization of the economy, the greater is the weight that should be given to foreign exchange market developments in setting domestic macroeconomic policy (Yinusa, 2007). Nigeria belongs to the "in between" group and as such, prominent attention should be given to developments in the foreign exchange market in designing macroeconomic policies to avoid unintended consequences. There would be no need for such a market if there were no international trade or capital movements. Growing liberalisation of foreign trade and deregulation of capital movements in Nigeria from the mid 1980s increased the need for a market where financial companies could trade foreign currency for Naira.

IV. Exchange Rate Management in Nigeria

Exchange rate management in Nigeria has evolved over the years spanning various exchange rate pricing regimes. Sequel to a major provision of the enabling law establishing the Central Bank of Nigeria (CBN) under exchange rate policy, maintenance of a healthy balance of payments (BOP) position and the preservation of the external value of the naira has been the major task given to the CBN. In its nearly five decades of existence, the CBN has adopted several foreign exchange management options in an attempt to achieve these objectives and more. Between 1960 and 1986, the country operated the fixed exchange rate regime backed by control measures under different genres. For example, between 1960 and 1967, the country's currency (the Nigerian pound) was fixed at par with the British pound. But from 1967 to 1974, the Nigerian naira (the new name for the country's currency) was pegged to the US dollar. Also, in April 1974, the authorities started a policy of progressive appreciation of the naira to reflect the improved strength of the naira as a result of enhanced foreign exchange receipts due to the oil boom and the improved BOP position.

There was, however, a policy reversal late in 1976 when dwindling oil fortunes and foreign reserves due to the oil glut, led to the fixing of the naira using import weighted basket of currencies of Nigeria's seven major trading partners[3] (Komolafe, 1996 and Obaseki, 1991). This currency basket system under the fixed exchange rate mechanism actually ran from 1978 to 1986.

The effects of this pegged exchange rate mechanism are legion. The naira became overvalued, the economy became distorted and there was unbridled importation of finished consumer goods which had dire consequences for domestic production, the level of external reserves and the BOP position. Sharp practices on the part of dealers and end users of foreign exchange compounded the problem leading to prolonged BOP problem.

It was against this background that the market based Second-Tier Foreign Exchange Market (SFEM) was introduced in September 1986 as the corner stone of the Structural Adjustment Programme (SAP). Among the problems this liberalized system was expected to solve included finding a realistic value for the naira, ensuring the competitiveness of goods produced in the country, addressing the problem of import dependence and capital flight, attracting foreign investment into the country and reducing the spread between the official and parallel market exchange rates. To address these problems, this market based system has undergone a lot of fine-tuning and witnessed the adoption of various methods. For example, in July 1987, the first and second tier markets were merged into the Foreign Exchange Market (FEM). By March 1992, there had been a complete floating of the naira instead of pre-determining quotas. There was, however, a policy reversal in 1994 with the introduction of "guided deregulation" by which the exchange rate of the naira to the dollar was fixed at ₦22.00. This ultimately led to the introduction of the Autonomous Foreign Exchange Market (AFEM) and the abolition of the 1962 Exchange Control Act in 1995.

But like any regulated system in Nigeria, AFEM failed because of inherent abuses, sharp practices and bureaucratic bottlenecks. In October 1999, AFEM gave way to the Inter-Bank Foreign Exchange Market (IFEM) which was expected to shore up the value of the naira and achieve a realistic naira exchange rate. However, because of persistent high demand for foreign exchange culminating in continued depreciation

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[3] *The seven currencies include US dollar, British pound, German mark, French franc, Japanese yen, Dutch guilder and the Swiss franc.*

of the naira, persistent depletion of foreign exchange reserves and widening premium between the official and parallel market exchange rates, IFEM was also abandoned.

In July 2002, the Dutch Auction System (DAS) was re-introduced to address the problems identified under IFEM. Under the DAS, end-users, through their authorized dealers buy foreign exchange at their bid rates, and the rate that clears the market (marginal rate) is adopted as the ruling rate till the next bid session, with the CBN intervening twice weekly. DAS has succeeded in ensuring a sustained accretion to the country's foreign reserves (which now stand at $40b), narrowing the arbitrage premium between official and parallel market rates (IMF, 2003) and achieving a more realistic exchange rate value for the naira. Indeed to further consolidate on these gains, the authorities introduced a variant of the DAS - the Wholesale Dutch Auction System (WDAS) in February, 2006. The CBN also licensed some commercial banks to establish Bureau de Change (BDCs) in a bid to checkmate the activities of parallel market operators. Furthermore, in the last quarter of 2006, the CBN appointed fourteen foreign banks to manage about $7b of Nigeria's external reserves.

All these efforts, plus the recent consolidation in the banking industry account for the sustained accretion to the country's foreign reserves, narrowing of the premium between the parallel and official exchange rates and the enhanced value of the naira exchange rates.

V. Central Bank Intervention in the Foreign Exchange Market

Under currency pegs, official purchases and sales of foreign currency to bridge the gap between foreign currency supply and demand at a given price are often rules-based in that the timing and amount of intervention are predetermined. In contrast, official intervention in the foreign exchange market is optional, or discretionary, under a flexible exchange rate regime, although authorities still can and do intervene, usually to correct misalignments, calm disorderly markets, supply foreign exchange, and accumulate reserves. Thus, a government that is shifting to a flexible regime needs to formulate policies on the objectives, timing, and amounts of intervention. Like all other markets, foreign exchange markets are imperfect. For example, “herding” (when investors buy or sell en masse) and “feedback trading” (trading driven by price movements rather than fundamentals) may result in the misalignment of a currency with a country's economic fundamentals, with serious repercussions.

Among other things, an overvalued currency undermines the competitiveness of the country's exports, while an undervalued exchange rate could stoke inflation.

Moreover, when a country's capital account is not fully liberalized, or its capital market is inefficient, temporary shocks may trigger exchange rate volatility in "thin" markets. Volatility can be politically costly because the exchange rate serves as a symbolic measure of a government's success in macroeconomic management. And long-lasting misalignments and erratic exchange rate movements can subject cost and income projections in the real sector to wide margins of error, making long-term planning and investment difficult. However, misalignments are difficult to detect, and there is no consensus on a methodology for estimating the equilibrium exchange rate. The indicators used most frequently the nominal and real effective exchange rates, productivity and other competitiveness measures, the terms of trade, the balance of payments, interest rate differentials, and parallel market exchange rates-usually do not enable policymakers to assess the degree of misalignment accurately enough to help them determine the optimal timing and amount of intervention.

Even when policymakers detect exchange rate misalignment or destabilizing volatility, central bank intervention may not always correct the problem. The empirical evidence on the effectiveness of intervention in influencing the exchange rate is mixed, and the impact of intervention on the exchange rate level appears to be short-lived. Empirical studies have also found that intervention tends to increase, rather than decrease, exchange rate volatility (Adubi, 2002). Thus, short-term exchange rate volatility may not warrant intervention, especially when it occurs in a liquid, or orderly market. Volatility may reflect the market process of price discovery and provide useful signals to policymakers and market participants.

Central bank intervention is usually justified, however, to calm disorderly markets that is, markets with unequal number of sellers and buyers of foreign exchange, resulting in illiquidity. If market illiquidity persists, it can hurt the real economy. Although volatility that is due to disorderly markets and that is likely to lead to a collapse of liquidity is also difficult to detect, acceleration in exchange rate changes, widening bid-offer spreads, and a sharp increase in inter bank trades relative to customer-bank turnover are signs to watch for. Central banks may also have to intervene in the foreign exchange market to supply foreign currency or build up their reserves. First, many central banks have a regular supply of foreign currency because of income on foreign reserves and their roles as the bankers of governments that borrow or receive aid in foreign currency. Second, they normally target a certain level of reserves, requiring the regular purchase of foreign currency to maintain core reserve coverage ratios.

A country may need to re-evaluate its international-reserve management policy when it moves to a flexible exchange rate regime. On the one hand, the level of reserves required to maintain a flexible rate may be lower than that required to maintain a fixed one. In addition, improved supervision of private sector foreign currency exposures may reduce reserve requirements. On the other hand, the elimination of capital controls may create a need for higher reserves to maintain or boost market confidence and lower exchange rate volatility, reduce the likelihood of crises, and increase the effectiveness of intervention, while providing funds for the government to invest in longer-term assets with higher returns. In general, central banks should be selective in their interventions and parsimonious in their use of foreign reserves. The difficulty of detecting exchange rate misalignments and disorderly markets means that decisions on the timing and amount of intervention are subjective and may be off the mark. Moreover, by entering the market infrequently, central banks can convince the markets of their commitment to exchange rate flexibility and improve the potential effectiveness of the occasional intervention. When a country introduces a band as part of a gradual move to exchange rate flexibility, intervention episodes may be more frequent than under more flexible regimes; nonetheless, central banks should minimize the number of interventions and make full use of the exchange rate flexibility allowed by the width of the band. Central banks in many advanced economies (for example, Canada, New Zealand, and the United Kingdom) seldom intervene in the foreign exchange market.

Transparency also helps build confidence in the new exchange rate regime, especially in the aftermath of a forced exit. Many countries, including the Philippines and Turkey, issued statements and policy reports affirming that they were committed to a flexible exchange rate regime and that they would not intervene in the foreign exchange market to target a certain exchange rate level. The published intervention policies of Australia and Sweden are good examples of the policies that need to be developed and communicated to the market to enhance the effectiveness of official foreign exchange operations. Disclosing information on intervention with a time lag can improve market transparency and central bank accountability. The United Kingdom discloses information on intervention in a monthly press release, the European Central Bank in a monthly bulletin; the U.S. Treasury confirms interventions on the day they take place and provides additional details in quarterly reports.

Selected country experiences suggest that rules-based intervention may be useful when the exchange rate is not under a lot of pressure in a one-sided market. Such a

policy may help countries supply foreign exchange or accumulate reserves without affecting the exchange rate. Eventually, however, central banks will gain enough experience and credibility to intervene on a more discretionary basis. Rules-based intervention policies tend to be transitory, abandoned or modified by most countries (for example, Brazil and Canada).

VI. Foreign Exchange Market Efficiency-A Must for Successful Liberalization

Duttagupta, Fernandez and Karacadag, (2005), Laurens (2005) and Mishkin, (2007) suggest that the following steps can help a country improve the depth and efficiency of its foreign exchange market:

Allowing some exchange rate flexibility (for example, within a band around a peg) to stimulate foreign exchange activity. Authorities should also foster a sense of two-way risk in the exchange rate - the risk that the currency may either appreciate or depreciate - to encourage market participants to take both short and long positions. Between 1995 and 2001, turnover increased in the foreign exchange markets of countries that adopted more flexible exchange rate regimes and declined in countries that adopted less flexible regimes.

Reducing the central bank's market-making role by cutting back its trade with banks and its interventions to allow scope for other market makers. The central bank should not trade with non-financial customers.

Increasing market information on the sources and uses of foreign exchange and on balance of payments trends to enable market participants to develop credible views on exchange rate and monetary policy and price foreign exchange efficiently.

Authorities should also ensure that information systems and trading platforms provide real-time bid and offer quotations in the inter-bank market.

Phasing out or eliminating regulations that stifle market activity. Important measures would include abolishing requirements to surrender foreign exchange receipts to the central bank, taxes and surcharges on foreign exchange transactions, and restrictions on inter-bank trading; unifying segmented foreign exchange markets; and relaxing current and some capital account restrictions to increase the sources and uses of foreign exchange in the market. Capital controls should be eased gradually, however, and only after certain macroeconomic and institutional preconditions have been met.

Unifying and simplifying foreign exchange legislation and avoiding frequent, ad hoc changes to the law, so as to increase market transparency and

reduce transaction costs.

Improving the market's microstructure by reducing market segmentation, increasing the effectiveness of market intermediaries, and securing reliable and efficient settlement systems.

Developing and deepening the foreign exchange market is more complicated when a country is forced to abandon a peg under market pressure and has not had time to prepare for an orderly exit.

The government is likely to face conflicting objectives. On the one hand, it needs to sell foreign exchange to prevent excessive depreciation. On the other, to maintain market credibility it needs to signal that it will not intervene to defend a particular exchange rate level. Under these circumstances, many countries have gradually renounced the central bank's market-making role, removed barriers to foreign exchange market operations, and tolerated greater exchange rate volatility, while allowing interest rates to rise to counter market pressure and monitoring market transactions to determine the sources and direction of other flows. However, the negative effects of volatility and rising interest rates on investment need to be weighed with the benefits of increased flexibility (Yinusa, 2007).

VII. Pace and Sequencing of Exchange Rate Liberalization

Countries face certain trade-offs in choosing between a rapid exit from a peg and a more gradual move to a floating exchange rate regime. A rapid approach involves fewer intermediate steps, if any, between fixed and floating regimes than a gradual approach.

For a country with a strong macro economy and a prudent monetary policy, a rapid approach can be a more credible signal of commitment to exchange rate flexibility than a gradual approach, while allowing the country to limit its interventions in the foreign exchange market and, thereby, conserve its foreign exchange reserves (Laurens, 2005). Countries seeking greater monetary policy independence may also be better off moving rapidly, as may those with an open capital accountit may be harder to pursue a gradual exit strategy in the presence of large and volatile capital flows. However, a gradual approach is preferable if a country lacks the appropriate institutional framework, including a deep foreign exchange market and the ability to monitor and manage exchange rate risk; such a country runs a high risk of experiencing excessive exchange rate volatility if it moves too quickly (Calvo, 1996).

The absence of a full-fledged inflation-targeting framework as an alternative nominal anchor need not preclude a rapid exit strategy, if there is a robust commitment to price stability. The building blocks of inflation targeting such as fiscal discipline, the monetary authorities' operational independence in pursuit of low inflation, credible steps to contain inflation, and transparency and accountability are fundamental to the success of any monetary policy regime regardless of whether inflation targeting is formally adopted. South Africa exited from a fixed peg to a float in the early 1980s but did not formally adopt inflation targeting until 2000. Other countries forced to float in one step for example, Mexico and Turkey used monetary targeting as an interim strategy before adopting inflation targeting.

A gradual approach allows the country to move toward a free float in measured steps for example, by shifting from a fixed peg against a single currency to a fixed or crawling peg against a basket of currencies, and then to an exchange rate band that is increased in increments.

Pegging to a basket of currencies has the advantage of reducing the transmission of external shocks to the domestic economy and tempering the exchange rate's exposure to the potentially erratic movements of a single currency. The basket may be composed of a weighted average of the currencies of a country's main trading partners. A shift to a crawling peg against a basket of currencies can help a country maintain its external competitiveness if its inflation rates are different from those of its trading partners. Moving to a horizontal or crawling exchange rate band can provide greater exchange rate flexibility and monetary policy independence. While these variants of pegged regimes are easier to maintain than wide exchange rate bands and floats, they constrain monetary policy and can be difficult for countries with liberalized capital accounts to sustain. In either case, whether the exit is rapid or gradual, each step forward should ensure two-way risk in exchange rate movements.

Early preparation for the move to a floating exchange rate increases the likelihood that the exit will be successful. A country should begin to lay the groundwork for the exit while it still has a peg, securing central bank independence, improving its ability to forecast inflation, making monetary policy more transparent, developing information systems on foreign exchange risk, and increasing information on balance of payments developments. Once it has laid the groundwork, it can move to a second stage, introducing some exchange rate flexibility to stimulate activity in the foreign exchange market, while it develops the other tools it will need to operate the new regime. Intervention policies can be addressed later in the transition.

Although policymakers have no control over the pace of a disorderly exit, they still need to make decisions about sequencing. Their top priority should be to stabilize the exchange rate; often, this can be done by eliminating the shortage of dollars in the market and maintaining monetary control. Policymakers should also attempt to signal a conservative monetary policy, although the design of an alternative nominal anchor will probably require more time. Adopting a flexible exchange rate before liberalizing the capital account enables a country to absorb capital account shocks at a lower cost to the real economy than under a fixed exchange rate.

By contrast, liberalizing the capital account first can help offset temporary current account shocks, expand the range of instruments available for risk management, and deepen the foreign exchange market. Accordingly, when an exchange rate is floated before the capital account is liberalized, central bank intervention may be needed to offset temporary current account shocks and to limit excessive real exchange rate volatility.

The experiences of emerging market economies over the past decade highlight the risks of opening the capital account before adopting a flexible exchange rate. Many countries were forced off pegs after sudden reversals of capital flows under open capital accounts (for example, Mexico at the end of 1994, Thailand in July 1997, and Brazil in early 1999). Others faced heavy inflows and upward pressure on pegged rates and had to allow exchange rate flexibility to avoid overheating the economy (for example, Chile and Poland during the 1990s). Thus, even under favorable economic conditions, opening the capital account before introducing exchange rate flexibility can threaten domestic liquidity, create macroeconomic imbalances, and precipitate speculative attacks.

In all, one can safely say that while it is better to plan an exit in a calm economic environment, even planned exits do not necessarily last. Many countries have reversed course after adopting a flexible exchange rate regime. Either macroeconomic conditions or a lack of institutions or both may contribute to the reversal from a float to a fixed regime. Fiscal dominance played an important role in the reversals of both Russia (1993-95) and Venezuela (2002-03), while Nigeria's reversal in 1994 occurred amid concerns about excessive depreciation. Other obstacles to floating in many developing countries include the limited number of participants in the foreign exchange market, pervasive exchange controls, a weak technological infrastructure, and underdeveloped money markets. Both fixed and floating exchange rates have distinct and different advantages. No single exchange

rate regime is appropriate for all countries in all circumstances. Countries will have to weigh the costs and benefits of floating in the light of both their economic and institutional readiness.

VIII. Conclusion

Given what we know so far, a reasonable view might be that liberalization brings about desirable effects in the long-run but it is dangerous in the medium run. The next natural question is how to reap the benefits without incurring the costs, or with minimal costs. This section concludes with some possible solutions.

Wait. Most countries will eventually liberalize, but this needs to be done as a matter of priority. When is the time ripe? A first answer is provided by the ubiquitous contrast between the effects of liberalization in the developing and the developed countries. It suggests that, *if one wants to avoid, at least to limit boom-and-bust cycles and high exchange pressure volatility, it may be useful to wait until a proper economic, and, possibly political infrastructure has been built.* This may take years, if not decades. *The implicit strategy advocated in the early 1990s, that economic liberalization will force economic and political progress, is dangerous: its success remains to be demonstrated and it is a bit too machiavellian to be comfortable with.*

Buckle up. The experience from both developing and developed countries suggests that liberalization is a source of widespread instability. Two conclusions follow. *It is important to set up adequate welfare systems before liberalizing. Free markets may raise efficiency, but they are known to increase inequality, at least initially.* Boom-and-bust cycles affect more seriously the poorer, less educated segments of the population. In addition, the boom years must be used to prepare for the bust years. Fiscal policy, in particular, ought to be used to build up public savings which will be available to combat financial meltdowns and protect those most hurt by the bust, if it happens.

Float or dollarize? Well, not necessarily. Is there a way out of the hard choice between waiting for decades and getting ready for acute volatility? One idea, defended among others by Arteta, Eichengreen and Wyplosz, (2001) and Eichengreen (1994) is to avoid the middle ground of pegged exchange rates, and opt for either of the two extremes, fully floating exchange rates and hard pegs (currency boards, monetary unions or dollarization). Some progress could be achieved by comparing liberalizing countries which adopted floating exchange rate regimes and

those that maintained, or sought to maintain, soft pegs. *Unfortunately, identifying truly floating exchange rates is proving to be a tricky exercise. Calvo and Reinhart (2000) and Benassy-Quéré and Coeuré (2000) show that many countries which declare floating exchange rate regimes in fact heavily manage their currencies.*

While it is true that currency crises cannot formally occur when the exchange rate is freely floating, pressure can take the form of excessive exchange rate fluctuations. Such fluctuations may have very severe effects, in terms of both competitiveness and currency exposure by various economic agents. *The view that floating is an option for each and every country fails to recognize the benefits from exchange rate stability, especially in countries which are open and have limited financial market services.* Europe's eagerness to limit exchange rate fluctuation, delaying for 40 years financial liberalization, provides an example of a successful strategy. Hard pegs, on the other side, are in vogue, but their costs (e.g. in Argentina) and the difficulty of designing credible exit strategies are being increasingly recognized. It seems fair to predict that the debate on 'extremes vs. the soft middle' will end up in a draw, much as it happened with the older debate on 'fixed vs. flexible rates'. Given that exchange rate regimes carry enormously widespread implications, a few simple criteria are unlikely ever to settle the debate. On the other side, it is crucial to realize ex ante that liberalization rocks the exchange markets. Building some form of exchange rate flexibility (either by floating or by being ready to realign pegs) into the liberalization program is essential. An appreciation (or revaluation) during the early capital inflow phase, clearly understood and presented to be temporary, could reduce the overheating. A depreciation (or devaluation) when and if the inflows reverse themselves into outflows and/or the economy slows down, could avoid an all-out attack and the subsequent output crash.

One step at a time. The seminal sequencing strategy advocated by McKinnon (1991) is to *start with domestic goods market liberalization, then to open up to trade, and then to proceed to domestic financial liberalization before finally setting free the capital account, possibly starting with long-term assets and keeping short-term assets for the last step.* This strategy has not been proven wrong so far. The most delicate steps are those involving domestic financial and capital account liberalization. Since they also tend to work in the same direction at the same horizon, spreading these measures several years apart seems reasonable.

Microeconomics matter. Structural conditions should be explicitly considered. The fact that crises are more likely when goods markets are not free, when banking

regulation and supervision is rudimentary, when corruption is rampant, and when property rights are not well established, is overwhelming. This is given a prominent position in McKinnon's list, and it should remain that way. *There is little point in liberalizing domestic and external financial markets when the goods markets and the financial institutions do not function properly.* Extreme examples like Nigeria even suggest that financial liberalization under such conditions is likely to do more harm than good.

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Monetary Policy Transmission Mechanism in Nigeria

*M. Ajayi**

1. Introduction

The formulation and implementation of appropriate monetary policy is one of the major responsibilities of central banks worldwide. Monetary policy can be described as a central bank's action to influence the availability and cost of money and credit, as a means of promoting national economic goals. Specifically, it can be defined as a combination of measures designed to regulate the value, supply and cost of credit in an economy in consonance with the expected level of economic activity. In broad terms, monetary policy aims at achieving price stability, full employment and economic growth, exchange rate stability, low interest rates and balance of payments equilibrium. However, recent experiences indicate the narrowing of the objectives of monetary policy to that of price stability. This is in realization of the fact that the achievement of all other objectives can be accomplished under stable prices in the medium to long-term.

The objectives are achieved by the central bank through the use of a number of instruments of monetary policy. The policy tools under the control of the central bank are not, however, directly linked to the policy objectives. Consequently, the usual practice is that intermediate targets such as money supply, interest rates and bank credit are employed to achieve monetary policy objectives. Generally, developing a practical understanding of how monetary policy action transmits to the economy remains a day-to-day challenge to central bankers. When a central bank takes a policy action, it sets in motion, a series of economic events. The sequence of events starts with the initial influence on the financial markets, which in turn slowly works its way through changes in current expenditure levels especially, private consumption and investment. Changes in domestic demand influence the current production levels, wages and employment, and in the process eventually lead to a change in domestic prices i.e. the rate of inflation. The chain of events, which link a

* *Ajayi is a Deputy Director and Head, Financial Analysis Division, Research and Statistics Department, Central Bank of Nigeria, Abuja. The views expressed herein do not represent the views of the institution to which he is affiliated.* *The author acknowledges the comments and suggestions of anonymous reviewers.*

change in monetary policy with changes in prices and output, is known as the transmission mechanism of monetary policy. In other words, transmission mechanism describes how changes in monetary policy transmit through the financial system, via financial market prices (interest rate and exchange rate) and quantities (money supply) to the real economy, affecting aggregate spending decisions of households and firms, and thus, from there to aggregate demand and inflation. There are long lags in the transmission mechanism (i.e. between monetary policy initiatives and the rate of inflation); thus, the chain of events emanating from a change in central bank policy rate or base money needs to be studied and analyzed. The study of these intricate links between economic variables will ensure that correct policy measures are taken now to produce a specific outcome in future. The identified channels in modern financial systems include interest rate, exchange rate, other asset prices including bond, stock market and real estate prices, and credit.

The monetary policy transmission mechanism varies in details between different economies because it depends partly upon the institutional structures. However, these differences are small and involve the relative importance of different channels rather than the existence of the channels themselves. Also, the design and implementation of monetary policy in a given economy depends on its financial structure and the macroeconomic environment.

The issue of transmission mechanism has been a subject of debate over time. The controversies centre largely on the complexity of the medium of transmission, the difficulty in quantifying the overall effects of policy changes on the economy and the problem of imperfect knowledge about shocks which are likely to adversely affect inflation and output volatility and, hence, the timing of the transmission channels. In spite of these controversies, an understanding of the transmission process is essential to the appropriate design and implementation of monetary policy. Essentially, in order to be successful in achieving the objectives of monetary policy, the monetary authorities must have a reasonable assessment of the timing and effect of their policies on the economy, thus requiring an understanding of the mechanism through which monetary policy affects the economy.

The main objective of this paper is, therefore, to review the monetary policy transmission mechanism in Nigeria with a view to appreciating the various challenges of the transmission process. Also, it highlights the need to continuously examine the channels of monetary policy in the economy to enhance policy design and implementation in Nigeria. The paper is divided into five parts. Following the

introduction as part I, Part II, discusses conceptual issues of monetary policy transmission mechanism, while Part III gives country experiences. Part IV x-rays monetary policy transmission mechanism in Nigeria and lessons from international experiences while Part V contains the concluding remarks.

II. Conceptual Issues

Monetary policy transmission mechanism is a description of how policy-induced changes in the nominal money stock or the short-term interest rate impact on real variables such as inflation, aggregate output and employment. In other words, the transmission mechanism describes the channels or the processes through which monetary policy actions of the central bank impact on the ultimate objectives of inflation and output. Specific channels of monetary transmission operate through the effects that monetary policy has on interest rates, exchange rates, equity and real estate prices, bank lending and firm balance sheets.

Four main channels through which monetary policy influences the economy have been identified in the literature namely, interest rates (sometimes referred to as liquidity channel), exchange rate, other assets prices and credit. The various channels reinforce each other but may vary in importance from country to country and from time to time. Furthermore, every monetary impulse (e.g an interest rate change by the central bank or change in monetary base through changes in minimum reserve ratio or open market operations) has a lag effect on the economy. The identified channels are discussed below:-

(i) The Traditional Interest Rate Channels

The traditional interest rate channels have featured in the literature over several decades as the key monetary transmission mechanism in the basic Keynesian ISLM textbook model. It can be characterized by the following schematic showing the effect of a monetary expansion:

$$?M \; ? \; ?ir \; ? \; ?I \; ? \; ?Y \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where (?M) indicates expansionary monetary policy leading to a fall in real interest rate (?ir) which in turn lowers the cost of capital, causing a rise in investment spending (?I), thereby leading to an increase in aggregate demand and a rise in output (?Y) .

Although Keynes originally emphasized this channel as operating through businesses' decisions about spending, later research recognized that consumers' decisions about expenditure on housing and consumer durables are also investment decisions. Thus, the interest rate channel of monetary transmission outlined above applies equally to consumer spending in which (I) represents residential housing and consumer durable expenditure.

An important feature of this transmission mechanism is its emphasis on the real rather than the nominal interest rate as that which affects consumer and business decisions. Furthermore, it is often the real long-term interest rate and not the short-term interest rate that is viewed as having the major impact on spending. It is important to note that changes in the short-term nominal interest rate by a central bank leads to a corresponding change in the real interest rate on both short and long-term bonds. This is explained by the phenomenon known as sticky prices, the fact that aggregate price level adjusts slowly over time. This means that expansionary monetary policy, which lowers the short-term nominal interest rate, also lowers the short-term real interest rate. The expectations hypothesis of the term structure, which states that the long-term interest rate is an average of expected future short-term interest rates, suggests that the lower real short-term interest rate leads to a fall in the real long-term interest rate.

The fact that it is the real interest rate rather than the nominal rate that affects spending provides an important mechanism for showing how monetary policy can stimulate the economy, even if nominal interest rates hit the floor of zero during a deflationary episode. With nominal interest rate at the floor of zero, an expansion in the money supply (?M) can raise the expected price level (?Pe) and, hence, expected inflation (↑πe), thereby, lowering the real interest ir (ir = i- πe) even when the nominal interest rate is fixed at zero, and stimulates spending through the interest rate channel:

$$?M \uparrow ?Pe \rightarrow \uparrow \pi e \uparrow ?ir \uparrow ?I \uparrow ?Y \quad \text{.....} \quad (2)$$

This mechanism indicates that monetary policy can still be effective even when nominal interest rates have already been driven down to zero by monetary authorities.

Conversely, a monetary policy tightening through a rise in interest rates makes it more expensive to borrow and consume today relative to the future. This causes a reduction in investment and consumption, and thus, a fall in aggregate demand. This

fall in aggregate demand below the economy's productive capacity eventually reduces inflation. The lags in this transmission channel are due to the time it takes for aggregate demand to respond to changes in interest rates, and the time it takes for inflation to respond to the output gap.

(ii) The Exchange Rate Channel

The exchange rate channel is an important element in the conventional open-economy macroeconomic models. With the growing internationalization of economies and the advent of flexible exchange rate, more attention has been paid to monetary policy transmission operating through exchange rate effects on the net exports. The chain of transmission here runs from interest rates to the exchange rate via the uncovered interest rate parity condition relating interest rate differentials to expected exchange rate movements. The uncovered interest rate parity relationship, assumes that equality should hold between the interest rate differential and the expected rate of appreciation or depreciation of the exchange rate.

The transmission channel holds that when the domestic real interest rates fall (?ir) following an expansionary money supply (?M), equilibrium in the foreign exchange market would require that the domestic value of the local currency relative to a foreign currency falls (?E), (i.e domestic currency depreciates), making domestic goods cheaper than foreign goods, thereby causing a rise in net exports (?NX) and hence, in aggregate output (?Y).

?M ? ?ir ? ?E? ?NX ? ?Y .....…….(3)

Put differently, when domestic real interest rates falls (?ir), domestic currency deposits become less attractive to deposits denominated in foreign currency leading to a fall in the value of domestic deposits relative to other currency deposits i.e. depreciation of the domestic currency.

Conversely, an increase in domestic interest rate, relative to foreign rates would lead to a stronger currency and a reduction both in net exports and in the overall aggregate demand.

(iii) Other Assets Channel

A key argument against the Keynesian monetary transmission mechanism is that it focuses only on one asset price, the interest rate, rather than other assets prices.

Monetarists view a transmission mechanism in which other relative asset prices and real wealth transmit monetary effects to the economy. For example, besides exchange rate, other assets prices include bond prices, equity prices, as well as house and land prices. The other assets channels are discussed below:-

- Equity Price Channels

Tobin's q Theory

Tobin's q theory provides a mechanism by which monetary policy affects the economy through its effects on the valuation of equities. Tobin defines q as the market value of firms divided by the replacement cost of capital. If q is high, the market price of firm is high relative to the replacement cost, and new plant and equipment capital is cheap relative to the market value of business firms. Companies can then issue equity and get a high price for it relative to the cost of plant and equipment they are buying. Thus, investment spending will rise because firms can buy a lot of new investment goods with only a small issue of equity. In order to understand this mechanism clearly, consider a situation of monetary expansion. Economic agents can invest their excess funds in the stock market, increasing the demand for equities and consequently raising their prices. Also, we note that monetary expansion leads to a fall in interest rates making bonds and other fixed interest financial assets less attractive relative to equities. This is represented schematically as follows:

?M ? ?ps ? ?q? ?I ? ?Y .....……(4)

When q is low, firms will not purchase new investment goods because the market value of firms is low relative to the cost of replacement of capital. If companies want to acquire capital they can buy another firm cheaply and acquire old capital instead thus, investment spending will be low.

Wealth Effects

An alternative channel for monetary transmission through equity prices occurs through wealth effects on consumption. In Franco Modigliani's life cycle model, consumption spending is determined by the lifetime resources of consumers, which are made up of human capital, real capital and financial wealth. A major component of financial wealth is common stocks. When stock prices rise, the value of financial wealth increases, thus increasing the lifetime resources of consumers, and consumption should rise as indicated in equation (5) below.

?M ? ?ps ? ?wealth? ? consumption ? ?Y …….(5)

The monetary transmission also operates through land and housing prices as they constitute extremely important components of wealth. A rise in housing and land prices will increase wealth thereby raising consumption. The Tobin's q framework also applies directly to the housing market.

(iv) The Credit Channels

The credit channel has a greater effect on expenditure of smaller firms, which are more dependent on bank loans, than it will on large firms, which can access the credit markets directly through stock and bond markets.

There are two aspects, namely the bank lending and the balance sheet channels.

- **Bank Lending Channel**

The bank lending channel is based on the assumption that banks play a significant role in the financial system in terms of channeling resources from surplus to deficit spending units. Expansionary monetary policy (?M), which increases bank reserves and bank deposits (?bank deposits), increases the quantity of bank loans available (?bank loan). Given banks' special role as lenders to classes of bank borrowers, the increase in loans will cause investment and (possibly consumer) spending to rise (?I) and hence aggregate output (?Y). Schematically, the monetary policy effect is:

?M ? ?bank deposits ? ? bank loans ? ?I ? ?Y ……..(6)

- **Balance Sheet Channel**

The balance sheet channel arises from the presence of information asymmetry inherent in the credit market. The lower the net worth of business firms the more severe the adverse selection and moral hazard problems are in lending to these firms. A lower net worth of business firms increases the moral hazard problem because it means that owners have a lower equity stake in their firms, giving them more incentive to engage in risky investment projects. Since taking on riskier investment projects makes it more likely that lenders will not be paid back, a decrease in business firms' net worth leads to a decrease in lending and, hence, in investment spending.

Monetary policy can affect firm's balance sheets in several ways. Expansionary monetary policy (?M) which causes rise in equity prices (?ps) and raises the net worth of firms, leads to higher investment spending (?I) because of the decrease in

adverse selection and moral hazard problems. This is schematically presented below:

?M ? ?ps? ?adverse selection ? ? moral hazards ? ? loans ? ?I ? ?Y ...…....(7)

Cash Flow Channel

Similarly, expansionary monetary policy which lowers nominal interest rates also causes an improvement in firms' balance sheet because it raises its cash flow, thereby reducing adverse selection and moral hazard problems. The relations are represented in the following schema:

?M? ?i? ?cash flow? ?adverse selection ? ?moral hazards ? ?loans ? ?I? ?Y……(8)

An important feature of this transmission channel is that it is the nominal interest rates that affect firm's cashflow and not the real interest associated with the traditional interest rate channel. Furthermore, the short-term interest rate plays an important role in this transmission because it is the payments on short-term rather than long term debts that typically have the greatest impact on the cash flows.

This transmission channel is applicable to firms as well as individual households. Accordingly, it forms an important transmission mechanism that the central bank can rely upon to deal with a financial crisis.

Unanticipated Price Level Channel

The channel operates through monetary policy effects on the general price level. An unanticipated rise in the general price level lowers the value of firm's liabilities in real terms (decreased debt burden) since debt payments are contractually fixed in nominal terms but should not lower the real value of the firm's assets. Thus, monetary expansion that leads to an unanticipated rise in the price level (P?) raises real net worth of firms which lowers adverse selection and moral hazard problems thereby leading to a rise in investment spending and aggregate output

M?? unanticipated P?? adverse selection ?moral hazard ?? lending? ? I?? Y?….. (9)

Household Liquidity Effects

This channel operates through the link between money and equity prices. Due to asymmetric information about their quality, consumer durables and housing are very illiquid assets. If consumers needed to sell their consumer durables or housing to raise money following a bad income shock, they would expect a big loss because they

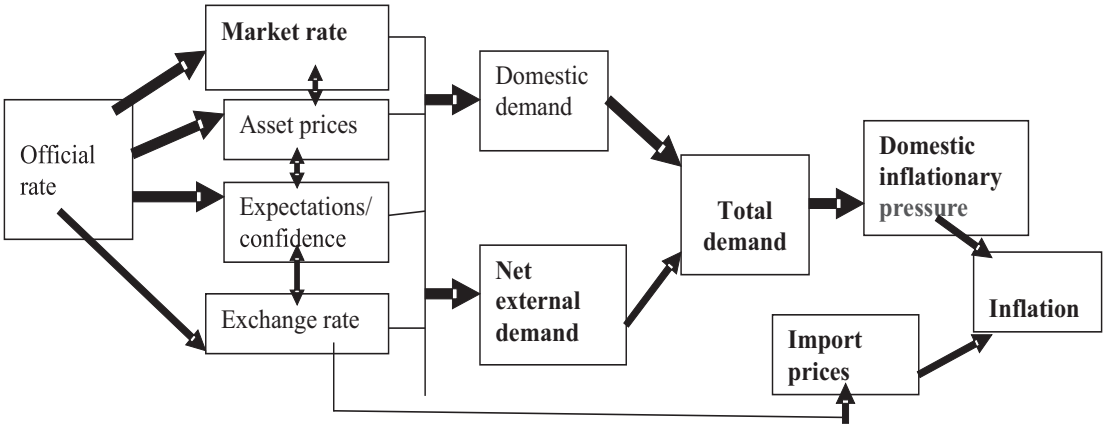
cannot get the full value of these assets in a distress sale. On the other hand, if consumers hold financial assets, they can easily sell them and get full market value of the assets. This channel focuses on liquidity effects on consumer durable and housing expenditure.

III Country Experiences

Britain

The Bank of England (BOE) uses the short-term official interest rate as its main instrument of monetary policy to influence other market rates. The official rate is determined by the Monetary Policy Committee (MPC). Like most central banks, the BOE is the monopoly supplier of 'high-powered' money which is also known as 'base money'. Through its operating procedure which is almost similar to most central banks, it chooses the price at which it will lend high-powered money to private sector institutions. The Bank's lending is predominantly through gilt sale and repurchase agreements (repo) of two-week maturity. The Bank also conducts daily transactions on Open Market Operations (OMO) where securities are purchased or sold to authorized dealers in order to influence monetary conditions. When a change in the official rate takes place, the effect is immediately transmitted to other short-term sterling wholesale money-market rates, money-market instruments of different maturities and to other short-term rates, such as inter-bank rates. The main links in the transmission are:-

Figure 1: The Transmission Mechanism of Monetary Policy in Britai



Source: Adapted from Bank of England Quarterly Bulletin, May 1999

South Africa

The Reserve Bank of South Africa uses the repurchase rate, (i.e. repo rate) as its main instrument of monetary policy to influence other market rates. The main links in the transmission mechanism of monetary policy, depicted in the flow chart below can be briefly described as follows: The repo rate has direct effects on other variables in the economy, such as other interest rates, the exchange rate, money and credit, other asset prices and decisions on spending and investment. Thus, changes in the repo rate affect the demand for and supply of goods and services. The pressure of demand relative to the supply capacity of the economy is a key factor influencing domestic inflationary pressures. Inflation is, amongst others, the result of pressures originating in the labour market and/or the market for goods and services as well as a result of imported inflation, which is influenced by exchange rate movements.

The size of the change in any central bank's interest rate is not a good indication of the likely impact of monetary policy on that economy. If the responses of interest rates, exchange rate, credit and other asset prices are insignificant to changes in the official interest rate, monetary policy will have little effect on the economy. In this regard, the channels are blocked or not fully functional.

The channels or transmission mechanism earlier discussed in this paper namely,

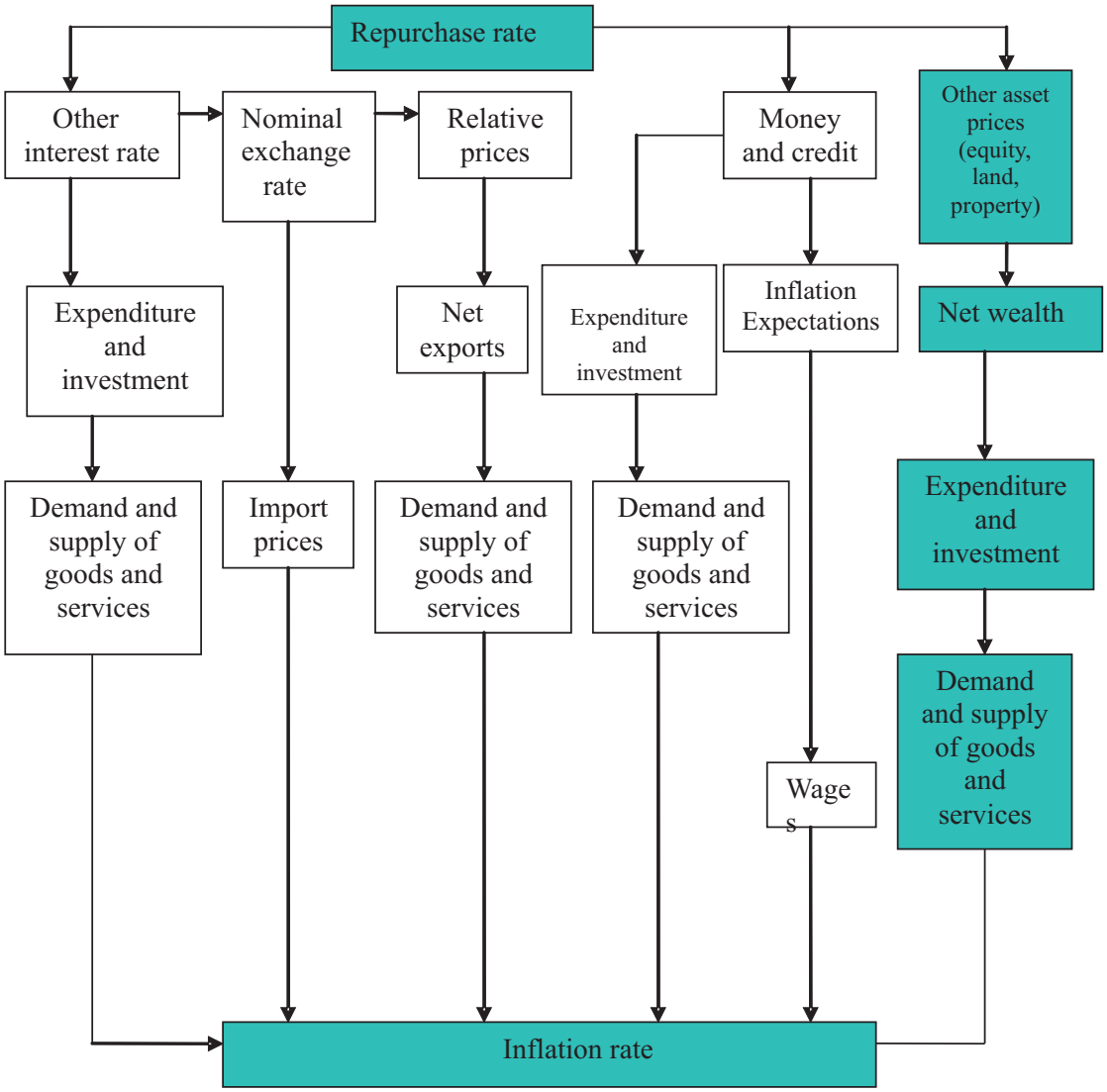
interest rate channel, other asset price channels and credit channels are relevant in South Africa although with different strengths of impact. For instance, changes in the repo rate influences the interest rates on retail financial products. Soon after the official rate is changed, domestic banks are inclined to adjust their lending rates, usually, but not necessarily by the same amount of change in the policy rate. Firms and individuals respond to the change in interest rates by altering their investment and spending patterns. As a result, consumer spending (C), fixed capital formation (I) and real output (y) start to respond. It is precisely through this channel that demand pressures feed through changes in the output gap to inflation. This can be schematically presented as follows:

? repo ? ? interest rates ? (?I, ?C) ? ?y

Through economic research, various models were developed to explore and better understand the channels through which monetary policy affects aggregated demand and ultimately inflation in South Africa.

In particular, a small macro-econometric model, incorporating as fully as possible the main channels of the transmission mechanism was developed by South Africa in an attempt to illustrate the transmission mechanism of monetary policy in that country. The repurchase rate was shocked by an increase of 100 basis points from its baseline scenario during the very first year of the 3-year simulation period in order to illustrate the change and time lag of the response. The results of the simulations with macro-econometric model, support the notion that there is a long time lag between a change in interest rates and the impact on the real economy, and that in some instances this impact will only be felt after a period of between four to six quarters. Only in the year 2000, when South Africa adopted inflation targeting monetary policy framework, did the importance of the time lags and magnitude changes of key economic variables begin to gain more prominence in that country. Fluctuations in the real economy influence the output gap, so that as the gap between actual and potential economic activity adjusts, inflationary pressures will start to change. However, the effects of the change in real output will only start to affect inflation after a further three to four quarters, with the result that the monetary policy transmission mechanism can be expected to have an impact on inflation after a period of between 12 and 24 months, with the full impact taking at least 2 years.

Figure 2: The Transmission Mechanism of Monetary Policy in South Africa



Source: Adapted from "How Monetary Policy Works", edited by Lavan Mahadeva and Peter Sinclair, 2005

IV. Monetary Transmission Mechanism in Nigeria

The objectives of monetary policy have not changed significantly over time, or departed from the overall desire to maintain macroeconomic balance. However, the transmission mechanism has tended to vary with the changes in approaches to monetary policy. While the objectives of monetary policy in the early 1970s were designed to deal with four main broad objectives, namely price stability, high rate of unemployment, sustainable economic growth and balance of payments, the approach of monetary policy implementation has evolved over the years from absolute reliance on direct controls in the 1970s and early 1980s to focus on the market based system of monetary control. Since the mid-1980s, and consistent with the marketbased policies of the structural adjustment program, the techniques of monetary policy relied on the indirect instruments to realize its objectives.

The Transmission Mechanism under the Direct Monetary Control

Under direct controls, monetary management depended on the use of direct instruments, such as credit ceilings, selective credit controls, administrative fixing of interest rates and exchange rate as well as the prescription of cash reserve requirements. The main objective then was to ensure that funds were made available to the productive sectors of the economy such as agriculture and manufacturing at relatively cheap terms. Under this regime, monetary policy impulses through changes in interest, exchange rates and credit ceilings were expected to positively affect changes in output and prices through the credit channel. Achieving the objective of monetary policy under this approach was, however, hampered by excessive fiscal dominance and poor compliance with statutory directives by deposit money banks as operators continued to hide credit transactions in a way that prevented funds from flowing into the preferred sectors of the economy. Consequently, with the introduction of the market based economic policies under the structural adjustment program in the mid-1980s, the Central Bank consciously changed its techniques of monetary policy to reflect market characteristics. Accordingly, the use of market based instruments of policy became popular and for the first time Open Market Operations, (OMO) became prominent as an instrument of monetary policy.

Transmission Mechanism under the Indirect Approach to Monetary Control

The financial reforms of the mid-1980s provided a watershed for monetary policy reforms in Nigeria. First, the transition from direct to indirect approach meant that the

instruments as well as the transmission mechanisms of policy would change. Second, while the broad objectives of ensuring macroeconomic balance continued to be an area of focus, the desire for policy effectiveness necessitated a refocusing on narrow targets believed to have a strong bearing on the ultimate objectives.

Under the indirect approach, the link between the monetary base and money stock, determined by the money multiplier is emphasized under the monetary targeting framework, which the Bank adopted. The underlying assumption for using the base money as the operating target is that the Central Bank of Nigeria has control over its liabilities- the base money (particularly the reserve component). With the multiplier known (by assuming the knowledge of the required reserves and currency deposit ratios), the authorities are in a good position to achieve a desired level of money supply via the manipulation of its high powered money. Since the introduction of OMO as the main instrument of monetary policy in 1993, the interest rate and to a large extent, the exchange rate channels have been explicitly prominent in transmitting monetary policy impulses to the real sector in Nigeria. Consequently, while the operating target- the base money- is periodically adjusted to change the level of money supply, the effects are expected to work through the impact on short-term interest rates or the exchange rate to effect changes in output and prices.

Empirical evidence from Nigerian data indicates the following results:-

Changes in base money take about two months to affect the money supply, the main intermediate target of policy.

Changes in money supply in turn take about 12 months to affect output. Thus, it takes about 15 months for changes in CBN monetary policy action, via base money and money supply (M2) to have its full impact on output.

On the other hand, and contrary to evidence in other countries, the relationship between output and inflation seems weak and unstable but more stable between money supply and inflation.

It takes about 24 months for money supply to have its full impact on inflation; but using exchange rate and money supply as explanatory variables, the effect on inflation actualizes within one year.

Furthermore, preliminary study by the Research & Statistics Department (2007) using a Vector Auto Regression (VAR) model on quarterly data, showed that the exchange rate channel was very strong in Nigeria between 1980 and 2005 while the interest rate and credit channels were weak. The results are not surprising given that the policy rate, the minimum rediscount rate (MRR), was not a transaction rate and

remained constant for a long time. In addition, the bulk of domestic credit went to government and not to the core private sector for most of the years under study. This is a preliminary investigation that needs further research. Thus, the results should be taken and interpreted with caution.

Challenges of Transmission of Monetary Policy in Nigeria

The challenges of assessing monetary transmission mechanism in Nigeria could be summarized as follows:

Large recognition lags, involving the time of recognition of anomalies and when precisely to take a decision. This border on adequate independence for the Central Bank of Nigeria (CBN) and availability of intervention instruments.

Absence of high frequency data that would aid effective assessment of monetary policy action, particularly data on the real economy such as GDP, investment spending, consumer spending, employment, etc.

Unreliability of information rendered by the deposit money banks.

Inappropriate macroeconomic models for Nigeria that would aid proper assessment of transmission of monetary policy.

Inadequate coordination between fiscal and monetary authorities with respect to liquidity flows in the economy (though improving).

Relative shallowness of the financial markets.

Lessons of Country Experiences

The experiences of the countries examined in the paper which are considered useful to Nigeria in our efforts at understanding the transmission mechanism on monetary policy are highlighted as follows:-

The development of an appropriate macroeconomic model for Nigeria should be pursued with vigor, including the improvement in both the quality and timeliness of data for result-oriented model. This is in line with the South African experience where through economic research, various models were developed to explore and better understand the channels through which monetary policy affects aggregate demand and ultimately inflation in that country.

Until an appropriate macroeconomic model for the Nigerian economy is

developed, the actual effects of transmission mechanism of monetary policy on the Nigeria economy may be difficult to ascertain.

The quality of information rendered to the CBN by Deposit Money Banks (DMBs) needs to be improved upon. This will enhance the reliability of data for monetary policy design in Nigeria.

An appropriate institutional and legal framework should be put in place to enhance the smooth functioning of the financial markets.

Efforts should continue to be made to deepen the Nigerian financial markets in order to enhance effective transmission of monetary policy impulses to the economy.

V Concluding Remarks

The various processes of monetary policy transmission mechanism were reviewed in the paper. Four major channels of transmission of policy impulses to the economy identified in the literature were discussed, while the effectiveness of each was found to depend on the institutional as well as the policy and economic environment of the country. The various channels of transmission mechanisms at one time or the other have been relevant to the Nigerian economy. However, recent preliminary study indicated that the exchange rate channel was very strong in Nigeria between 1980 and 2005, while the interest rate and the credit channels were weak during the period. The experiences of other countries, such as Britain and South Africa show that a macro-economic model, incorporating as fully as possible the main channels of transmission mechanism should be developed in Nigeria to enhance the understanding of the monetary policy transmission process. Furthermore, with effective policy coordination and clarity of vision and policy objectives, it is possible to have a smooth transmission of monetary policy impulses to the real economy. We would like to conclude that understanding the channels of transmission of monetary policy is critical to the design and effective implementation of monetary policy in Nigeria.

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Standing Facilities and Liquidity Management in Nigeria: Progress so Far and Challenges Under an IT Environment

*J. K. A. Olekah**

I. Introduction

The ultimate goals of the central bank monetary policy are to achieve and maintain price stability, high employment and financial viability. Since the monetary policy instruments available to the central bank, however, can not directly impact on these macroeconomic variables, it usually deploys its policy instruments to influence some intermediate targets, which in turn will influence the ultimate targets. The central bank may decide to target inflation directly using the inflation targeting framework for monetary policy implementation. Many central banks have adopted this approach, which is believed to address the problem of inflation expectation and may even deliver a lower inflation rate if all the conditions are met. Most central banks, however, deploy their monetary policy instruments to influence some intermediate targets which in turn impact the ultimate target. The intermediate targets include monetary aggregates, short-term interest rates and exchange rates. The levels of these variables will essentially determine the levels of credit, interest and exchange rates in the economy. The monetary policy instruments available to the central bank under the indirect monetary management include open market operations, reserve requirements, repurchase and reverse repurchase transactions, discount window operations, and foreign exchange operations.

While the ultimate objective of monetary policy remains the achievement of price stability, the focus of monetary policy implementation is the achievement of stability of short-term interest rate or exchange rates around the operating targets announced by the central bank. The money market inter-bank call/overnight rates are operating targets of the central bank monetary policy implementation.

Through the conduct of open market operations, the central bank increases or

* *Olekah is the Director, Banking Operations Department, Central Bank of Nigeria, Abuja. The views expressed herein do not represent the views of the institution to which he is affiliated.* *The author acknowledges the comments and suggestions of anonymous reviewers.*

decreases the level of money supply, which in turn influences the level of interest rates in the money market. If exchange rate is the intermediate target, the central bank buys or sells foreign exchange in order to stabilize the exchange rate around the central bank set target. The supply of settlement balances and overnight lending/deposits have become monetary tools in the hands of the central bank to influence intermediate targets. These instruments, which the central bank directly controls, will transmit through credit, interest rate, exchange rate and asset prices to impact money stock and the general price level ultimately.

In line with the global trend, the Central Bank of Nigeria introduced a new framework for monetary policy implementation on December 11, 2006. The overall objective of the new monetary policy framework is to be able to influence the short-term interest rates in the money market in an efficient and transparent manner. The main features include: setting of a policy rate (MPR), setting of a ceiling for banks' reserves determined by reserve-averaging mechanism over a maintenance period of two weeks, establishment of a standing facility for lending and deposits, and conducting open market operations including repo transactions, using money market instruments of 1day to 182-day tenors.

In this paper, the CBN standing facilities and their effectiveness in reducing inter-bank interest rate volatilities are discussed as well as the challenges that have been faced by both the CBN and market operators in the implementation. For ease of presentation the paper is organized into six sections. Following this introduction in section II, the CBN indirect monetary policy instruments are discussed as a prelude to the introduction of the standing deposit/lending facilities in December 2006. The CBN standing facilities as instruments of liquidity management are discussed in section III. Some of the countries that have adopted the policy instruments are surveyed in section IV. In section V, the progress that has been made is highlighted while the challenges being faced in the implementation are mentioned in section VI. The paper is concluded in section VII.

II. The Present Monetary Policy Instruments of the CBN

The CBN adopted the indirect instruments for monetary operations in 1993 with the Open Market Operations (OMO) as the major instrument but complemented by reserve requirements and discount window operations. The statutory reserve requirements (cash reserve ratio, (CRR) and liquidity ratio, (LR) are not subject to frequent changes, hence, they are not suitable for the day-to-day management of liquidity in the banking system. The OMO is an instrument that can be used to

increase or reduce the free reserves of the deposit money banks (DMBs) very quickly. The free reserves of the DMBs are operational target because they are the reserves on which banks can create money with total disregard for the monetary policy stance of the CBN. The instruments are discussed in more details as follows:

i. Cash Reserve Requirement (CRR)

CRR is set by the CBN to meet its monetary policy stance. If the desire is to pursue a tight monetary stance, CRR is raised in order to limit the ability of banks to create money through credit and advances. If the desire is to pursue a loose monetary stance, CRR is reduced to enable banks to give more loans and credits. CRR in cash, is deposited with the CBN and does not earn interest. The use of CRR as a monetary instrument is usually regarded as "blunt" in that both the strong and the not-very-strong banks are equally treated.

CRR for banks is currently at 3.0 per cent, down from 11.0 in 2005 and 8.0 and 5.0 per cent in early and late 2006. CRR for banks are calculated every two weeks and are debited or credited as the case may be. If a bank's CRR is found to be short of the 3.0 per cent, its current account in the CBN is debited with the shortfall while the CRR account is correspondingly credited with the shortfall. On the other hand, if a bank's CRR is found to be more than the 3.0 per cent, its current account in the CBN is credited with the excess while CRR account is debited with the excess.

ii. Liquidity Ratio (LR)

Liquidity ratio is the percentage of banks' deposit liabilities that must be kept in liquid assets, mostly in government treasury instruments, which can be turned into cash as quickly as possible if and when the need arises. LR for banks is presently set at 40.0 per cent. The use of LR is more of a prudential requirement than for liquidity management instrument. The amount set aside for LR is domiciled with the banks but they are constrained from investing the money in other instruments not specified by the CBN.

iii. Open Market Operations (OMO)

The CBN moved from the use of direct to indirect monetary policy instruments for monetary management in 1993 with OMO as a major instrument. OMO entails the injection or withdrawal of funds from the banking system in order to achieve monetary policy objectives. OMO targets the free reserves of the banks by either selling bills to banks in order to reduce their free reserves or buy bills from banks in order to increase their free reserves. When the CBN sells bills to the banks, the CBN

debits the current accounts of those banks and increase their bill holdings by the volume of the bills sold. When the CBN buys bills from the banks, the current accounts of the banks are credited with the cash and their holdings of bills are reduced by the cash equivalent of the bills.

The CBN presently conducts OMO in four ways, namely: Bill auctioning (outright sale/purchase of bills), the Two-Way Quote Treasury Bill trading between the CBN and Money Market Dealers (MMDs) as counterparties, reverse repurchase agreement, and repurchase agreement between the CBN and the banks. The four are discussed as follows:

a. Auctioning of the Nigerian Treasury Bills (NTB)

When the CBN wants to withdraw funds from the banking system, it offers NTBs of various tenors to MMDs electronically. Interested MMDs bid for the offered tenors (bills) electronically, quoting their bid rates and volumes for each of the offered bills. The bids are collated electronically and when the deal rates for each offered tenor are determined by the CBN, the stop rates for each tenor is broadcast to the market. Allotment of bills, won by each bidder and the accrued interest, are done within thirty minutes of the close of the bid. Payment for the bills won at the auction is either done on the day of allotment or on the following day, depending on the terms of the auction. Most often, payment is done on the following day (that is T+1). Same day payment for bills usually occurs when the day following the allotment day falls on a non-working day.

Sometimes the MMDs may not take up as much as the CBN wants and the MMDs are called upon to underwrite the remaining portion of the offer at the stop rate plus 0.125 percent as underwriting incentive. The appointment and use of MMDs is to enhance the effectiveness of OMO as an instrument for liquidity management as they assist the CBN to withdraw as much liquidity as possible from the banking system. The MMDs serve as "middlemen" between the CBN and non-MMDs banks and other non-bank public. Instead of the CBN dealing with a large number of customers, it only has to deal directly with 20 MMDs, consisting of 17 banks and 3 discount houses.

b. The Two-Way Quote NTB Trading.

The two-way trading of NTBs was introduced in April 2007 in order to deepen the money market and improve transparency in the conduct of monetary operations. The

system allows the CBN to contact the MMDs individually on any day and ask for their bid and offer rates or prices for NTBs of any tenor traded in the money market. A MMD is under obligation, when contacted by the CBN or any bank for that matter, to quote its bid and offer rates for any given NTB of any tenor being traded in the market. The CBN can either sell to or buy bills from the MMDs at their own quoted rates or prices. Usually the margin between the bid and offer rate are very small, about 50 basis points at most. When the CBN wants to withdraw funds from the system, it sells bills to MMDs and buys bills from them when it wants to inject funds into the system. The two-way quote trading is presently done on Reuters trading and information system. Settlement is done either same day or on T+1 basis depending on the need of the CBN or the counterparty.

The two-way quote trading of NTBs has been found to be very useful for liquidity management. Whenever the system is found to be very liquid and funds need to be withdrawn quickly, the platform is used with a high degree of success. The drawback that has been noticed, however, is that the system can lead to high cost of liquidity management as MMDs tend to quote higher rates for bills being traded on the platform in order to avoid losses. Again as the minimum volume of the CBN trading on the platform is ₦2.0 billion, the MMDs have to quote rates that will not make them make losses when trying to trade those bills in the market at small volumes. The CBN, on a few occasions, has bought bills from the MMDs instead of selling bills to them but the motive was not actually to inject funds into the system but to calm the rates in the market. It was observed that high rates were being quoted for bills without any relationship with the marked-to-market rates, that is, the rates at which the bills were currently traded in the market. When the CBN offered to buy instead of selling bills, the rates dropped immediately. The CBN is still fine-tuning the use of the system in order to get its maximum benefits.

c. Reverse Repurchase Agreement (Reverse Repo)

Reverse repo agreement is another OMO to reduce liquidity in the system but for a shorter period than outright sale of bills through auction or two-way quote bill trading. A reverse repo agreement is entered into between the CBN and a bank to exchange bills for cash at agreed rates for an agreed tenor. At the expiration of the agreed tenor, the CBN releases the cash and the banks return the bills. Meanwhile, the banks have collected the interest upfront on the cash they have invested. The rates at which reverse repo are transacted are set by the CBN and not auction-based but the rates are made comparable with the prevailing rates in the inter-bank market for

similar bills of similar maturities in order to make them attractive to the investors (banks).

Reverse repo agreement is useful to the CBN in managing liquidity and to banks in managing their portfolio. A bank with short-term deposits will find reverse repo a good investment outlet as the CBN presently has reverse repo agreement for between 7 and 28 days. Moreover, reverse repo agreement is made available to MMDs and non-MMD banks alike.

d. Repurchase Agreement (Repo)

This is the opposite of reverse repo agreement. The CBN gives out cash to a bank at a rate set by the CBN and takes bills from such a bank as collateral. The value of the bills is usually higher than the amount given out as a cover against loss in the value of the collateral. The rate charged is usually at the prevailing market rate plus additional percentage points as "hair cut". At the expiration of the repo agreement, the bank returns the cash and collects back its bills. Repo is another way of injecting money into the system and it is usually done when the banking system is short and banks need cash to square up their positions as the CBN will not allow banks to regularly overdraw their current accounts.

Repo agreement can be for overnight or for a number of days. The latter is known as tenored repo, which the CBN is yet to introduce. The overnight repo is similar to the CBN overnight lending facility currently being accessed by banks.

The CBN, in recent times, has used foreign exchange trading as an instrument to reduce excess liquidity in the banking system. As a complementary policy instrument, foreign exchange is sold to banks in order to withdraw excess liquidity from the system. The use of foreign exchange transaction as a monetary policy tool includes outright sale and swap.

There are other instruments that, if introduced, will further enhance the effectiveness of OMO as an instrument of monetary policy management. Deposit auctioning and securities lending are two notable ones. Deposit auctioning is a process by which banks with excess liquidity will "sell" such funds to the central bank at a rate set by the central bank. No exchange of bills is involved. The central bank buys the funds for a specified tenor and at a specified rate. At the end of the tenor, the funds revert to the bank. The process is used to lock in excess funds for a given period.

Securities lending is another instrument that can make the money market work relatively smoothly. A bank may have sold a class of bills that it does not have. To deliver the bills it has sold, it can borrow such bills from another bank, a custodian or the central bank at a cost. During the intervening period, the bank may look for the exact tenor of the borrowed bills and buy them in order to be able to return the borrowed bills at the expiration of the agreement. Without such arrangement, trading in the money market is constrained. A bank that is short in bills will find it difficult to operate well in the money market because it will not be able to borrow for lack of adequate collateral nor be able to access the central bank lending or repo facility for the same reason. But a bank need not hold all the bills it will require in the market if it can borrow such securities.

III. The CBN Standing Facilities

Standing facilities (deposit and lending) are instruments of liquidity management. They serve as avenues to invest surplus funds overnight and to square up whenever the system is short at the end of each business day. Ideally, the operators in the money market (banks and discount houses) are supposed to trade among themselves whereby those with surplus funds are to trade it with those that are short at a rate called the inter-bank overnight rate. After the needs of all the operators that are short have been met, the balance, if any, may be deposited with the central bank at a rate that is some basis points lower than the operation rate (monetary policy rate in Nigeria and cash rate in Australia) and most often less than the rate at the inter-bank market. On the other hand, if the surplus funds in the market is not enough to offset the debit positions of the operators that are short, the shortfall may be made available by the central bank in the form of lending facility at a rate higher than the operation rate by some basis points. For an operator to be granted a lending facility, it must have enough eligible securities to serve as collateral for such borrowing. An operator without eligible securities will find it difficult and costly to borrow from the inter-bank market or from the central bank.

The adoption of the standing facilities is to achieve some policy objectives among which are:

i. To encourage inter-bank trading and thereby deepen the market. The punitive interest rate for lending is to discourage operators from coming to the central bank to borrow while the low deposit rate is to discourage the operators from depositing their funds in the central bank when they could get higher rates in the market. It is when an operator could not source funds in the market for non-availability of funds that it is expected to approach the central bank as the lender-of-last-resort. An operator with surplus funds is expected to lend to

others who are in need of such funds. It is when such an operator has no one to lend to that it is expected to approach the central bank for deposit facility.

ii. To smoothen or eliminate volatility of short-term over night interest rates. This is a short-run objective. Without the standing facilities, inter-bank interest rates tend to rise extraordinarily when the money market is generally short. A few operators that have funds to lend are at liberty to charge very high interest rates and the operators that are short and are in dire need have little or no choice but to accept to pay the high rates. The standing facilities are expected to eliminate this difficulty. A few operators cannot hold others to ransom knowing that the central bank's lending facility is available to those in need. When the system is long, those with surplus funds need not lend at ridiculously low rates when they can deposit such funds in the central bank at some reasonable interest rates. Following this knowledge by all the operators in the market, the inter-bank rates tend to fall within the interest rate corridor of the deposit (floor) and the lending (ceiling) rates.

iii. To provide liquidity in the money market. The standing facilities provide liquidity in the market. Whenever the market is short, the central bank is ready to provide liquidity (funds). The provision of liquidity, especially to an operator who has securities but short of funds, makes the inter-bank market to operate smoothly.

iv. To reduce or eliminate excess banks' reserves. Liquidity management strategy is to reduce banks' reserves to the minimum in order to control excessive creation of money by banks. By offering to remunerate banks reserves through deposit facility, the central bank is able to withdraw banks excess reserves to its coffer.

v. To influence other rates in the economy. The ability of the central bank to curb excessive volatility in the short-term interest rates, paves the way for it to influence other rates. It is expected that operators in the economy will adjust their rates to reflect the movement in the inter-bank overnight rates.

The Central Bank of Nigeria (CBN) adopted the standing facilities on December 11, 2006 as an important component of the new framework for monetary policy implementation that was introduced at the time. A monetary policy rate (MPR) of 10.0 per cent was set to replace the hitherto policy anchor interest rate, the minimum rediscount rate (MRR). The standing deposit facility was set at 300 basis points

below the MPR while the standing lending facility was set at 300 basis points above it, translating to 7.00 and 13.00 percent, respectively. The operators in the market, who always try to minimize cost and maximize profits, are expected to lend and borrow within the interest rate corridor. The MPR of 10.0 per cent was in operation until it was reviewed downward to 8.0 per cent in June 2007 and the interest rate corridor was reduced from +/-300 to +/-250 basis points following the observed downward trend in inflation rate, stability in the exchange rate, strong external sector reserves, and the sustained economic reforms by the government among other things.

IV. Country Experiences

Many central banks have adopted the standing facilities as monetary policy tool in recent times. They include the European Central Bank (ECB), Central Bank of Brazil (CBB); Bank of Canada (BOC); and Reserve Bank of Australia (RBA), to mention just a few. These are discussed here:

The ECB

The ECB carries out its mandate to maintain price stability by using monetary instruments at its disposal to affect market interest rates, regulate liquidity in the banking system and signal the general stance in monetary policy. Eurosystem monetary policy is conducted in a decentralized way, with the Governing Council of the ECB making the decisions and the national central banks carrying out most of the operations. Among the monetary instruments available to the ECB are:

- The interest rates on main refinancing operations which signals the stance of monetary policy;
- Open market operations which are used for steering interest rates, managing the liquidity situation in the market and signaling the stance of monetary policy;
- Standing facilities used to influence the short-term interest rate movement and signaling the stance of monetary policy; and
- Reserve requirements by which credit institutions are required to hold a certain amount of minimum reserves with the national central banks.

Institutions' holding of required reserves are remunerated at the rate on the Eurosystem's main refinancing operations. The ECB has two standing facilities: the marginal lending facility and the deposit facility. The counterparties can use the marginal lending facility to obtain overnight liquidity from the national central banks against eligible assets. The interest rate on marginal lending facility normally

provides a ceiling for the overnight market interest rate. Counterparties can use the deposit facility to make overnight deposits with the national central banks. The interest on the deposit facility normally provides a floor for the overnight market interest rate.

Central Bank of Brazil (CBB)

The monetary policy operating target chosen by the CBB is the short-term interest rate. The major policy instrument for the achievement of the set target is the standing facilities complemented by open market operations and discount window operations, which are used when it is absolutely necessary. Before 1996 when the CBB began to rely more on standing facilities as an instrument of monetary policy, it usually ensured that sufficient funds were available in the system so that participants in the money market did not need to turn to it for assistance. If necessary, however, banks could have recourse to end-of-day assistance which was granted at posted rates. Excess reserves were not remunerated. A bank with financial difficulty was expected to use the discount window facilities and if it could not meet its requirement from the discount window facilities, the CBB might contact the open market dealers and try to find a lender for the bank in financial difficulty. If there was no lender, the CBB was then under obligation to provide direct assistance to the bank through repo provided the proper guarantees were offered. Before the introduction of the lending facility, discount window rates were usually below the inter-bank rates, which encouraged the banks to recourse to the CBB for credit rather than borrowing from the inter-bank market. In 1996, some changes were introduced into the monetary policy operating procedure, which tend to make the CBB standing facilities the main monetary policy instruments. The Bank created a standby deposit facility, which remunerates deposits and a standing lending facility on December 2, 1998 following the relative stable internal and external economic conditions. An interest rate corridor, which stipulates lending (ceiling) and deposit (floor) rates, is set every five to six weeks by the Monetary Policy Committee (MPC) to serve to signal the trend of the main operating target of the CBB.

Bank of Canada (BOC)

The operating target of the BOC is the overnight interest rate. In order to be able to ensure sufficient liquidity in the banking system and at the same time eliminate excess liquidity, the BOC sets the Bank Rate which forms the ceiling or the standing lending facility interest rate. Institutions with debit balances at the end of the day can borrow from the BOC at the Bank Rate using eligible instruments as collateral.

Institutions with surpluses at the end of the day receive interest on these balances at 50 basis points below the Bank Rate which forms the floor for the overnight interest rate. The discriminating rates encourage market participants to deal or trade among themselves rather than approaching the Bank when they want to adjust their surplus or deficit positions. If the inter-bank overnight rate is above the Bank Rate (the target rate), that is an indication of liquidity shortage and the BOC can intervene with repo in order to inject funds into the system and if it is below, that is an indication of excess liquidity, the Bank will intervene with reverse repo to withdraw funds from the system. The operation of the standing lending and deposit facilities and the use of repo transactions enable the BOC to influence the short-term overnight rates which is its operating target.

The Reserve Bank of Australia (RBA)

The operating target of RBA is the overnight interest rate known as "cash rate" which is the interest rate on overnight loans among institutions in the money market. The Bank tries to keep the "cash rate" as close as possible to the overnight rate by influencing the supply and demand of funds in the money market by using open market operations and by lending "exchange settlement funds" to banks and remunerating bank reserves. Banks may borrow from the RBA at 25 basis points above the "cash rate" but banks reserves are remunerated at 25 basis points below the "cash rate". When the system is short, inter-bank rate will rise above the "cash rate". In order to bring the inter-bank rate to the target "cash rate" the RBA will have to inject funds into the market by buying securities from the market. By so doing, the supply of what is called "exchange settlement funds' will increase and overnight interest rate will fall. If the inter-bank rate is below the "cash rate", the RBA will reduce "exchange settlement funds' in the market, and cause the overnight rate to increase toward the level of the "cash rate".

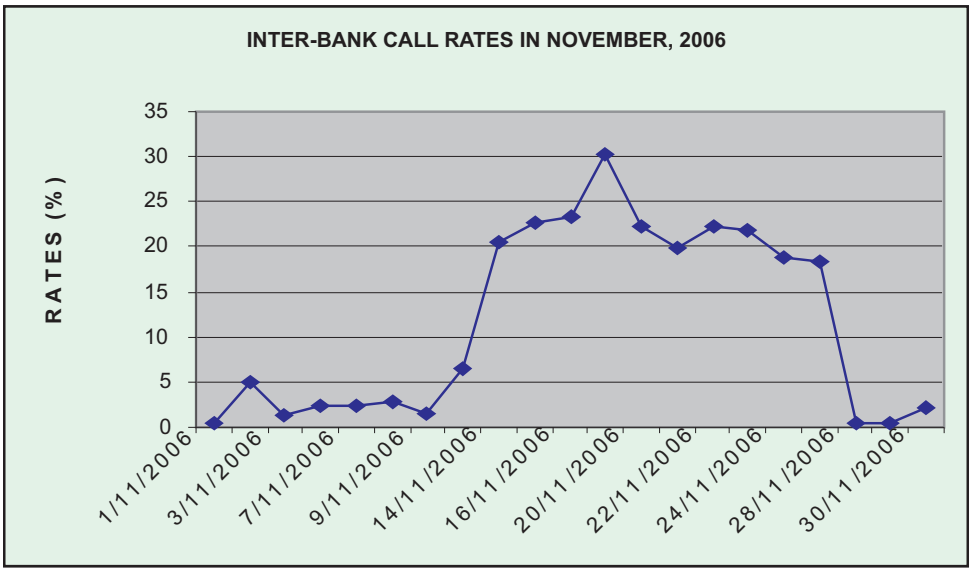
V. The Progress so Far

In this section, an attempt is made to appraise the progress that has been made since the introduction of the standing facilities as monetary policy tool by the CBN. As stated earlier, the facilities were put in place to address, among others, the wide swings that characterized inter-bank interest rate movements in the money market. We start the appraisal by looking at the rate movement prior to the time the new instrument was introduced.

In November 2006, inter-bank call rates ranged from less than 5.0 per cent to 30.0 per

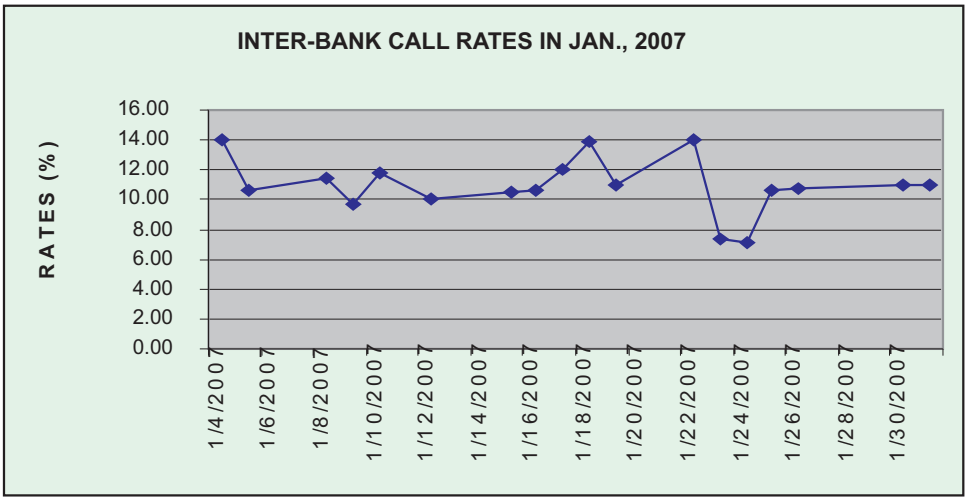
cent. This pattern was typical of the rate movements in the inter-bank market before the adoption of the new framework for monetary policy implementation in December 2007 (Chart 1). At the beginning of each month the rates were usually low indicating sufficient or excess liquidity in the system. The rates would increase toward the middle of the month as banks in custody of government revenue began to remit such funds to the CBN for the Federation Account toward the Federation Account Allocation Committee (FAAC) meeting that usually holds in the middle of the month. Immediately after the FAAC meeting, the revenue allocations to states and local governments are credited into their various accounts in the banks. As a result, inter-bank rates would begin to fall, reaching as low as 2.0 per cent at times before increasing again until the cycle was complete.

Chart 1



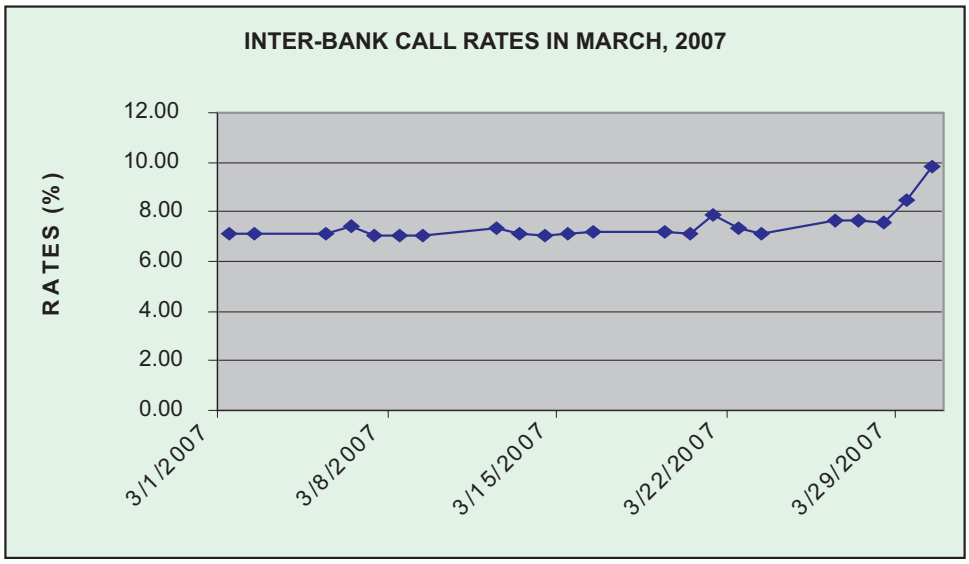
The operation of the standing facilities in January, 2007, which was the first full month of the operation, gave their effect on the inter-bank call rates as shown in Chart 2. The MPR was set at 10.0 percent at the inception of the standing facilities with lending and deposit interest rates at 13.0 and 7.0 percent, respectively. In January, it was observed that inter-bank call rates ranged from 7.0 to 14.0 per cent. Between 14 and 22 January, 2007 rates increased but not beyond 14.0 per cent, (100 basis points above the CBN standing lending rate). When the accounts of the beneficiaries of the statutory revenue allocations were credited, the inter-bank rates dropped and ranged from 7.0 to 11.0 per cent, falling within the interest rate corridor of between 7.0 and 13.0 per cent.

Chart 2



The movement of the inter-bank call rates in March 2007 indicated clearly the effectiveness of the monetary policy tool (Chart 3). The rates fell within 7.0 and 10.0 per cent throughout the month. Despite the need for banks to remit large sums of money for the FAAC meeting in March, the inter-bank call rates did not increase beyond 10 per cent because the banks that were short in liquidity were able to access the CBN lending facility at 13.0 per cent. The banks that had excess reserves were able to access the CBN standing deposit facility at 7.0 per cent.

Chart 3

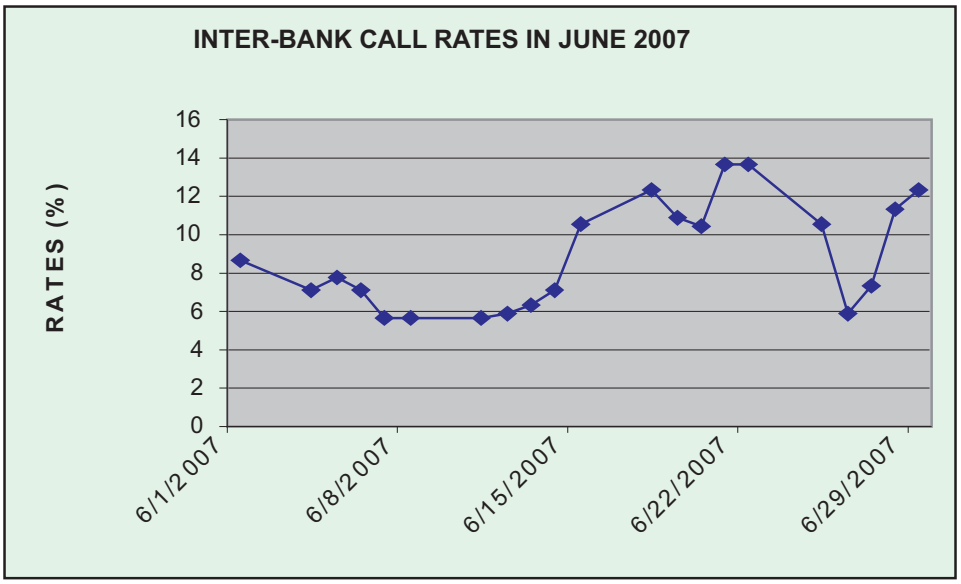


The banks and discount houses traded among themselves, most often within the interest rate corridor, with the full understanding that the CBN facilities were available to any bank or discount house that needed them.

Banks with excess reserves needed not lend such funds at a rate lower than the CBN standing deposit interest rate of 7.0 per cent while banks that were short needed not borrow at a rate higher than the CBN standing facility interest rate of 13.0 per cent

Following the downward trend in the rate of inflation which stood at 6.4 per cent in May 2007, the MPR was adjusted downward by 200 basis points from 10.0 to 8.0 per cent in June 2007. The interest rate corridor was also narrowed to 500 basis points with deposit lending facility rate at 5.5 per cent and lending facility at 10.5 per cent. The monetary operations in June brought a lot of pressure on the inter-bank call rate which is depicted in Chart 4.

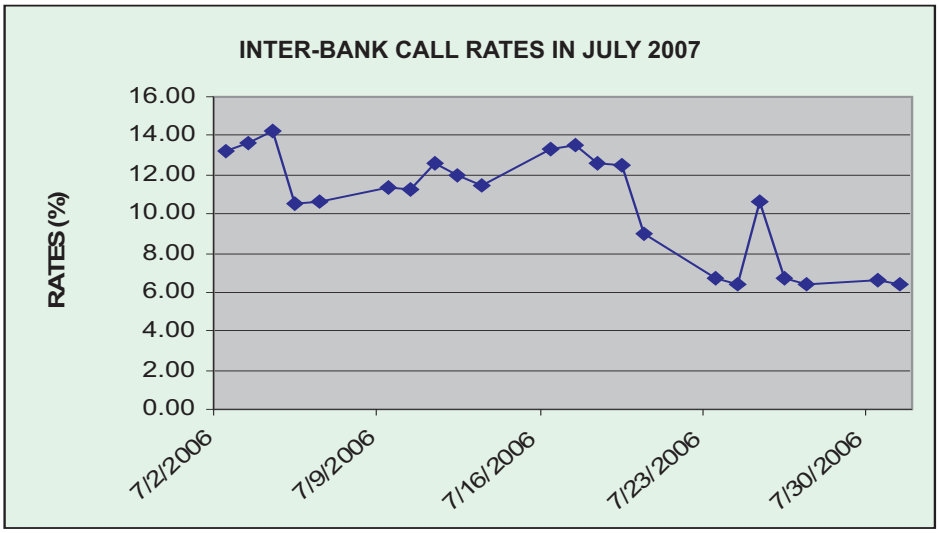
Chart 4



The need to meet monetary and economic targets of the third review of the Policy Support Instrument (PSI) led to the aggressive mop up of liquidity in the system. As a result the inter-bank call rates that ranged from 5.5 and 10.5 percent during the first two weeks of June 2007 rose to almost 14.0 per cent before declining and closed at about 12.0 per cent as at the end of the month. The outcome of the use of monetary instruments in June 2007 threw up some challenges for a need to have realistic liquidity forecast and monetary targets. While the estimates of liquidity in the system vis-à-vis the targets indicated the existence of excess liquidity in the system, the rise in the inter-bank call rates as well as the opinions of the operators in the money market clearly showed that the excess liquidity was grossly exaggerated.

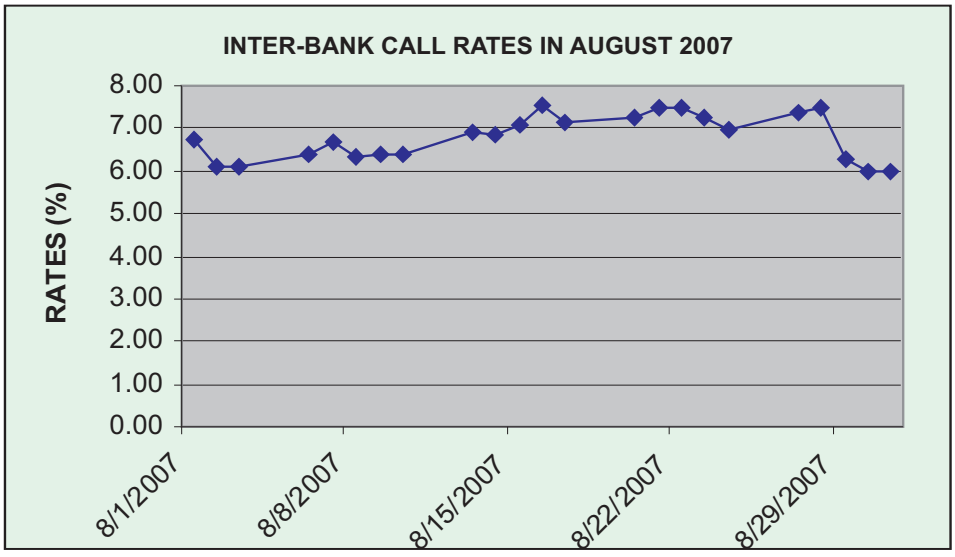
The ripple effect of the excessive mopping of liquidity in the banking system in June continued into the first three weeks of July as shown in Chart 5. The liquidity in the banking system was tight throughout during the period and only eased after the release of FAAC revenue allocation and the payment of matured bills. The inter-bank call rates declined to about 6.2 per cent during the last week of July 2007.

Chart 5



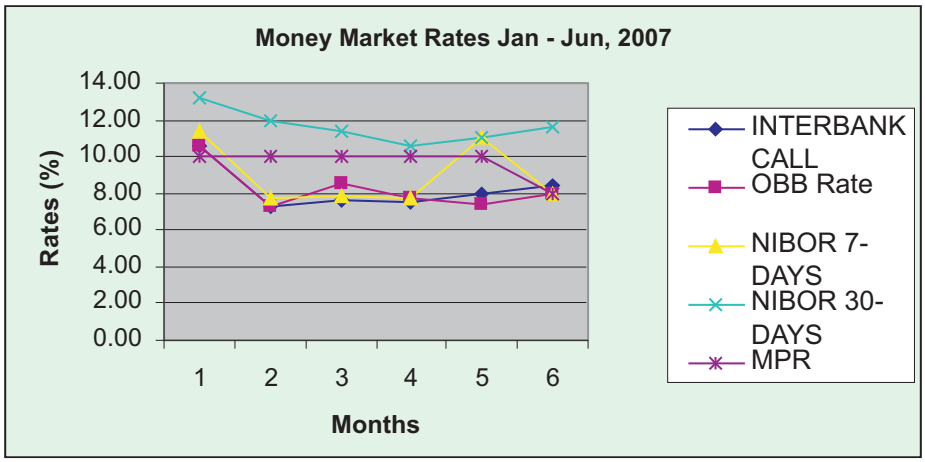
In August 2007 the market had re-adjusted and inter-bank call rates had moderated hovering between 6.0 and 7.5 per cent as shown in Chart 6.

Chart 6



The inflow of liquidity mostly from the operations of the three tiers of government and from private foreign investors has continued to pose a challenge to the monetary operations of the Bank. It has been observed that the CBN deposit facility has been accessed by the operators in the money market than the lending facility as a result of excess reserves that banks closed with almost on daily basis. During the first six months of 2007, the CBN granted the sum of ₦608.01 billion as lending facility as against taking in ₦12,818.71 billion deposit facility during the same period.

Chart 7



One of the objectives of the standing facility is to be able to influence the short-term overnight interest rate and through it the other rates in the money market. From Chart 7, it can be seen that all the money market rates fell within the range of about 7.0 and 13.0 per cent. The inter-bank call rates and the rates at Open-Buy-Back (OBB) (the rates at which banks trade bills, lend and borrow among themselves) assumed the same trend and fell within the interest rate corridor. The 7 - and 30-day Nigerian Inter-bank Offered Rate (NIBOR) trended downward except in May when there was a spike, especially on the 7day segment.

Movements in interest rates in the money market are expected to influence rates in the economy such as lending rates, mortgage and other consumer credits. An analysis of the movements in these other rates will be worthwhile at the end of the first year of the adoption of the instrument.

VI. Challenges

The implementation of the CBN standing facilities has not been without it own

challenges, which have limited its achievements. The monetary policy framework pre-supposes that banking system reserves will be accurately determined at all times in order to be able to know if there is going to be a need to withdraw from or inject funds into the system. For this purpose, banks' current account and settlement account balances must be available, not only to the banks but also to the central bank on real time. The framework also pre-supposes that an efficient payments system is in place as a vehicle to transmit the transactions that take place in the money market. It is pertinent to note that some of the conditions that are required for efficient and effective operation of the CBN standing facilities are still lacking. The major challenges are directly related to information technology (IT) as they are presently in the Bank. The challenges include but not limited to the following:

i. None or limited interface between the CBN Temenos T24 banking application and the CBN Inter-bank Fund Transfer System (CIFTS), leading to the inability of banks to accurately determine their balances at end of business each day. A bank that has a debit balance in its current account (T24) but a credit balance in its settlement account (RTGS) is unable to transfer fund from RTGS to its T24 account. Such a bank may come for lending facility at the close of business but only to discover the following day that it actually closed with a surplus;

ii. Inability of the IT system to execute mandates leading to failed transactions and supply of wrong and misleading information. Sometimes the system fails to debit or credit counterparties as instructed thereby recording wrong balances for banks. In some instances the system had wrongly credited or debited a bank's account several times for the same transaction which necessitated manual reversal of such wrong postings whenever they were detected.

iii. For efficient and effective operation of the standing facilities, especially for liquidity management purposes, the CBN must be able to forecast accurately the level of excess liquidity in the banking system on a daily basis. However, due to the difficulty with IT, that has not been possible;

iv. Frequent out-of-order being experienced by the counterparties. The CBN counterparties (banks, discount houses, etc) always complain of breakdown in the system which causes much delay. The CBN had to provide some internet outlets at its office in Lagos for banks that are unable to have access to

the CBN from their own ends to post their transactions to the Temenos Internet Banking (TIB).

v. Long communication channel between the users and IT personnel/service providers. Most often, problem that requires to be attended to within a few hours may take two or three days to receive attention due to the layers of authorities a desk officer will have to go through to get attended to;

vi. Inadequate number of skilled IT personnel sufficiently empowered to fix IT problems as they arise. A lot more IT personnel need to be employed, trained and given the required authority to do certain things without compromising the overall interest and security policy of the CBN;

vii. Insufficient number of the IT equipment. Users are most often unable to communicate to counterparties due to lack of functional telephones. Most often the internet server do not work or may be very slow in responding to given instructions, leading to delay and frustration.

VII. Conclusion

In this paper, we have examined the CBN standing facilities as instruments for liquidity management. The specific objectives the instrument is expected to achieve were also stated. Some central banks including the ECB (the Eurosystem), that have adopted the instruments were surveyed. The progress that has been made with the use of the standing facilities with respect to its stated objectives was appraised. It was shown that the instruments have had some moderating effect on the inter-bank call rate volatilities that was hitherto noticeable. The challenges that have made the implementation of the standing facilities very difficult and limited their achievements were highlighted. Most of the challenges are IT related. For an effective monetary policy implementation, an efficient payment system and good IT infrastructure are required.

It is pertinent to note that a standing facility, as an instrument of liquidity management, is essentially a short-term measure. Huge and persistent inflow of liquidity from within and outside the economy will require other measures that will help the policy makers to sterilize or eliminate excess liquidity in the system on a more permanent basis in order to be able to achieve stable prices, interest and exchange rate levels.

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Exchange Rate Policy Design: Choosing the Right Exchange Rate Response in a Changing Environment

*O. O. Akanji (Mrs) **

I Introduction

When the Central Bank of Nigeria took the decision to consolidate the banks and make them stronger by raising the capital base to ₦25 billion, it was done with the mindset of having a complete strategy for the financial sector improvement of which foreign exchange market liberalization was being anticipated in pursuance of the Financial Sector Strategy (FSS) 2020.

The bank consolidation took effect from December 2005 while the liberalization of the Foreign Exchange Market commenced on the 20th February, 2006, with the Wholesale Dutch Auction System (WDAS) replacing the Retail Dutch Auction System (RDAS). In addition, in anticipation of the Nigerian Government acceding to the Policy Support Instrument (PSI) in January 2006, the exchange rate policy design and the "fair level" in response to the changing environment gained momentum. On the take-off of WDAS, the marginal banks that could not raise the required sum for consolidation and could not get other merger arrangements could also not have access to foreign currency from the parallel market supply- a "trade" the marginal banks perfected for survival. The inadequacy of currency in the parallel market resulted in the large depreciation of Naira exchange rate by about ₦20/$ or 16.3% percent. It should be recalled that the naira was revalued using the special auction to increase supply at the official window. The appreciation encouraged the widening arbitrage observed at the parallel market. Consequently, the CBN resorted to supply strategy by approving that the Bureaux-de-Change (BDC), the third segment of the market has access to the official window at the official rates. The policy of opening the official market to the BDCs led to the convergence of the rates of the three markets in July 2006.

As this development requires an assessment of the adequate level of an exchange

** Mrs. Akanji is the Director, Trade and Exchange Department, Central Bank of Nigeria, Abuja. The views expressed herein do not represent the views of the institution to which she is affiliated.* *The author acknowledges the comments and suggestions of anonymous reviewers.*

rate, familiar concepts of equilibrium exchange rates were considered to provide valuable advice to the CBN management. Not surprisingly, therefore, the wide arbitrage which had been proved as a supply gap and addressed by CBN policy of accepting the Bureaux-de-change (BDC) to the official window to supply forex reduced the arbitrage in the parallel market. There was ancillary liberalization of some current account transactions in support of the supply strategy of the currency. Since the inception of the policy in April 2006, to admit the BDCs into the official market, there has been a massive real exchange rate appreciation.

This strong real appreciation may represent a strong undervaluation of Naira in the early 1990s even with appreciable level of foreign reserves to the tune of US$24 billion as at end-2004, implying that a significant part of this strong appreciation could reflect a gradual convergence of the exchange rate towards its equilibrium level over time. Such an eventuality has important implications for the empirical work, which helped to choose the right exchange rate response in the changing environment.

Choosing the right exchange rate response in a changing environment within the Nigerian context dwells not only on the empirical work but also on the behavioural exchange rate observed in other emerging economies. It is observed that a more flexible exchange rate will conserve our international reserves and normalize interest rates to levels compatible with the needs of our fast-growing economy. A more flexible exchange rate will also prevent speculators from gaining at the expense of the rest of the economy.

Nigerian economic fundamentals remain very strong. Our economic growth is accelerating. Inflation is declining. Our financial system is very healthy and we are precisely allowing more exchange rate flexibility to preserve all these gains.

The rest of this paper is structured into four parts with the introduction as part I. Part II gives the overview of Nigeria's exchange rate framework. Part III reviews different concepts of equilibrium exchange rates with a focus on the fundamental equilibrium exchange rate (FEER) and the behavioural equilibrium exchange rate (BEER) approaches. Part IV discusses the challenges encountered in choosing the right exchange rate response in the new banking sector environment. Part V concludes the paper and proffers the way forward.

II. Overview of Nigeria's Exchange Rate Framework

Since 1986 when the Structural Adjustment Programme (SAP) was instituted, monetary policy in Nigeria has been centred on management of the exchange rate. The primary objective of this framework has been to promote price stability as a sound basis for sustainable economic growth. The framework which has been broken into regimes has incorporated several features of the basket, band and crawling (BBC) regime as indicated in the studies by Williamson (1998, 1999). These are discussed as follows:

First, the Naira (₦) was managed against a basket of currencies of its major trading partners and competitors. The various currencies were assigned different degrees of importance or weights, depending on the extent of Nigeria's trade dependence on that particular country.

Second, the Central Bank of Nigeria operated the inter-bank foreign exchange market (IFEM). The IFEM was conducted as a managed float, reflecting the global trend where exchange rate management have become more market-based, with greater reliance on inter-bank exchange markets as the core of wider currency markets in developing and emerging market economies. Consequently, the IFEM was allowed to fluctuate without establishing the band for fluctuation. However, several incidents of sharp practices and abuses by operators were reported in the market. The development in the IFEM resulted in significant depreciation of the naira which was not reflective of economic fundamentals.

Third, the exchange rate policy changed to Foreign Exchange Dutch Auction System where the naira exchange rate is determined by auctioning and the clearing rate determines the exchange rate. This approach is still based on managed float regime while the management incorporated a "crawling" feature. This is to continually assess the path of the exchange rate, so as to avoid misalignments in the currency value.

Fourth, the exchange rate policy in 2005 allowed the exchange rate to fluctuate within a policy band ($\pm$3%), the level and slope of which was announced in the first quarter of 2005 to the market. The band provides a mechanism to accommodate short-term fluctuations in the foreign exchange markets and flexibility in managing the exchange rate. The exchange rate policy band was periodically reviewed (specifically every quarter) in relation to economic fundamentals. This was to ensure that it remained consistent with the underlying fundamentals of the economy.

Notably, the fact that the exchange rate operates as the intermediate target of

monetary policy implies that domestic interest rates do have implications for the path of exchange rate. In the context of free movement of capital, interest rates in Nigeria are expectedly attractions for foreign investors.

The Retail Dutch Auction System transited to Wholesale Dutch Auction System (WDAS) with expectant depth and sophistication owing to transactions taking place through electronic and computer systems. The WDAS has continued to enjoy the benefits of relative liquidity and efficiency expected of the market. Again, it is expected that going forward WDAS will not suffer from unstable and low volume of foreign exchange flows as well as lack of trust between market dealers, to mention just a few, before the CBN takes the decision to fully intervene and do away with WDAS. The success of the consolidation exercise has provided muscle for WDAS as the threat of insolvency of deposit money banks has been overcome, payment system has become more efficient and communication systems have witnessed some imrpovement. As WDAS evolves, international payments will encourage rapid growth in the volume of international transactions as well as the application of new technologies. Electronically based technologies have become prevalent, reducing transaction costs and payment lags and improving the security and reliability of individual transactions.

The importance of foreign exchange settlement risk cannot be over-emphasized. It is expected that the payment system committee will address the continuous linked settlement (CLS) facilities to enable settlement of different lags of foreign exchange transaction simultaneously. The take-off of WDAS is to signal that official regulation and exchange control have completely been dismantled.

It must be mentioned that the Central Bank of Nigeria has developed codes of conduct for dealing among market participants and agreed a platform for information technology to facilitate inter-bank dealings, supported by the strengthened payments and clearing arrangements.

III Different Concepts of Equilibrium Exchange Rates

In designing exchange rate policy, it is pertinent to understand the concepts that drive the equilibrium exchange rates determination. In Nigeria, exchange rate policy has been assigned an intermediate target of monetary policy. This implies that to get equilibrium exchange rates (or rather stable exchange rate) the monetary policy must be consistent with fiscal policy. For instance, if the exchange rate was depreciating because of weak fundamentals, foreign exchange intervention will not help stabilize

the rate for very long unless the Central Bank raised interest rates. Likewise, trying to reverse depreciation by intervening in the foreign exchange market will be ineffective in the face of large budget deficits. These concepts of equilibrium exchange rate are discussed as follows:

Purchasing Power Parity

A familiar starting point for empirical exchange rate design and analysis is the theory of purchasing power parity (PPP), which states in its absolute version that the "law of one price" for prices of goods holds across countries. This theory can be made operational by using data on purchasing power parity exchange rates, where the PPP exchange rate is defined as the number of units of a country's currency required to purchase the same basket of goods in that country as one unit of the numeraire currency would buy in numeraire country. For instance, for the Nigeria Naira against the dollar, the PPP conversion factor is defined as the number of Naira needed in Nigeria to buy the same basket of goods and services as one dollar would buy in the dollar area. As at September 2007 the PPP exchange rate of the Nigerian Naira was ₦125.00 while the actual dollar-Naira exchange rate was ₦/$ 126.25. This implies that the real value of the Naira in the dollar area is about 1% lower than in Nigeria. Obviously, this is strongly related to the fact that non-traded goods prices are much lower in Nigeria than in the dollar area, while traded goods prices should be more similar across countries. However, owing to the impediments of trade and regulatory factors, price convergence for traded goods may also be incomplete. Accordingly, absolute PPP, by itself, appears to provide a rather poor guide for judging the "fair" level of an exchange rate. As a potential alternative, the PPP condition is less strict in its relative version as it requires that the inflation differential at home and abroad is reflected in a corresponding change in the nominal exchange rate. If relative PPP were actually the only driving factor behind fluctuations in the nominal exchange rate, the real exchange rate would have to be constant. Econometrically, however, it has proved difficult to convincingly confirm this relationship. It is well documented in the literature that the real exchange rate is either found to be non-stationary or that the adjustment of the exchange rate to any PPP equilibrium is extremely slow (see Rogoff 1995). Studies on major currencies suggest that the adjustment process generally involves a half-life of three to five years.

Against the background of the shortcomings of the PPP approach, there are alternative measures of exchange rate equilibrium which are suitable for assessment purposes and which should be sought. In this context, the monetary approach to

exchange rate determination constitutes an option which is an extension of PPP and this was noted by MacDonald (2000) as that which endogenises the price determination in two countries based on supply and demand for money. In the recent literature on equilibrium exchange rates of emerging market of the central and eastern European countries, two other approaches have been more prominent: the fundamental equilibrium exchange rate (FEER) approach, advocated by Williamson (1994), and the behavioural equilibrium exchange rate approach (BEER), initially proposed by Clark and MacDonald (1999). In applying these to the Nigerian economy, both approaches have their pros and cons, which are reviewed in the following sections.

Fundamental Equilibrium Exchange Rates (FEER)

The FEER approach can be characterised as normative in the sense that it delivers an equilibrium exchange rate consistent with "ideal" economic conditions, i.e. external and internal equilibrium. This approach was employed at the start of the Wholesale Dutch Auction System (WDAS). There are three steps involved in the estimation of the FEER. First, we obtained the current account position from the Research Department and estimated the current account deficit that would materialize in a given year if the country is producing at her potential output level and the effect of past exchange rate changes had been fully realized (exchange loss on the reserve level estimated at maximum of 20 months of imports). Second, we obtained an estimate of the "medium-run-equilibrium (sustainable) current account position" (which is also the saving-investment norm or target current account position). The final step involves measuring/calibrating the change in the exchange rate needed to close the gap between the underlying and the medium-run equilibrium current account position, thus yielding the FEER. This was accomplished to set the stage for the dismantling of controls on current account transactions which led to further liberalization of the foreign exchange market.

In spite of its analytical elegance, the FEER approach has a number of drawbacks, which may be even more pronounced considering where we are coming from and where we want to be. The first problem arises in the determination of the sustainable current (or capital) account or debt level. The welcome development in the Nigerian context is the payment of the foreign debt. This is a core variable of the framework, as the direction of the divergence between the underlying current account/debt level and the medium run current account/debt level determines whether an exchange rate is eventually considered to be over - or undervalued. Any estimate of a sustainable

current account deficit is, however, surrounded by significant uncertainty (see Bussie're and Fratzscher (2004), Doisy and Herve (2001)). Moreover, using past development of the current account deficit to set the norm for the new exchange rate policy design, this method could be controversial but we needed a benchmark at all cost to move forward.

Furthermore, changes in productivity are often not directly accounted for in this approach. Accordingly, this method does not fully take into account that a real appreciation due to higher productivity growth does not have an adverse effect on price competitiveness, while it may affect the sustainability of the current account balance, moreso, when the balance of payment is tilted to increasing trend in current account surplus arising from oil revenue inflow driven by the increasing international oil price increases. Without doing more empirical work, it was obvious that the level of competitiveness for exports will be compromised if the appreciation of the currency continues in the way the reserves is building up, except with a deliberate policy to stall the appreciation of the currency.

Moreover, it is not fully clear in this approach, how the significant inflows in foreign direct investment observed since 2006 having an immediate effect on the current account balance, should be accounted for. However, over time the FDI flows have served as a proxy in determining the dollar liquidity in the system and have helped to reduce pressure on the accretion to reserves that the WDAS operates with. Finally, the derivation of internal balance requires estimates of the output gap. While this is already a controversial topic in the case of industrialized countries, estimating the potential output for emerging economies is even more difficult due to data problems and structural changes.

Another significant difficulty relates to the estimation of trade elasticities, which in the case of Nigeria is significant as a trading nation. Therefore, we simply use the export and import price elasticities. These drawbacks may translate directly into biased results. In the first step of the analysis, the actual current account balance is corrected for the lagged effects of past exchange rate changes, thereby computing the underlying current account balance. As the exchange rate depreciated in the past, the underlying current account balance is pushed more strongly in positive territory than the actual current account balance. If the imposed export and import price elasticities are high, the underlying current account deficit could almost by construction, exceed the medium-term current account.

This could be one explanation why FEER calculation obtained before WDAS took off showed an undervaluation of the Naira. In fact, the FEER design can help in establishing the magnitude of misalignment in spite of the drawbacks. This is because the openness of an economy plays a key role in the designing of the exchange rate policy. Accordingly, a minor change in the exchange rate has a strong impact on the current account balance and, consequently, minor changes in the real exchange rate are sufficient to bring the current account into equilibrium. Owing to this strong reaction of the current account to the real exchange rate, it is impossible, by construction to find a strong misalignment.

A final reservation on the FEER approach stems from the underlying assumption that only the exchange rate adjusts to close the gap in the current account. It appears difficult to reconcile this mechanism with empirical observations. If the current account reacts so strongly to changes in the exchange rate, why are we not observing the deficits in the current account to be higher now, given the continuous real appreciation of the currency in the last one year? It seems there is a subtle depreciation of the currency.

Behavioural Equilibrium Exchange Rates (BEER)

The BEER methodology is not based on a specific structural model, but is rather more statistically oriented than the FEER approach. In principle, it builds on PPP but instead of assuming constant real exchange rate overtime, it accounts for real factors explaining the slow reversion of the real exchange rate to its PPP equilibrium. Accordingly, it allows for a time-varying equilibrium path of the real exchange rate. This method is beset with data problems. However, in the "managed float" approach (i.e. stabilized around some path which even allows for some real trend appreciation) regressing productivity on the real exchange rate would provide a schedule for the equilibrium exchange rate around which the actual real exchange rate fluctuates. The assumption underlying the regression analysis is the zero-average misalignment. As a result, it cannot be ruled out that one may find in such a setting a subtle depreciation of the currency. It may be important to emphasize that we do not wish to claim that this necessarily reflects reality, but rather to show that it is important to take such an eventuality into account.

IV Challenges in Choosing the Right Exchange Rate

Over the years before 2006, the inflationary trend had provoked the depreciation of the currency. There was, however, a turn-around where for the first time in 20 years,

the inflationary trend was single digit and the currency achieved appreciation and convergence of the three markets. In getting to this utopian status as it were, was a serious challenge to the management of the foreign exchange market. These challenges are discussed along three major areas- (i) financial integration/banking system and monetary policy, (ii) fiscal policy and the issue of negative list, (iii) streamlining policy making, regulation and supervision.

(i) Financial Integration/Banking System and Monetary Policy

It has been established with the consolidation exercise that financial integration and a better performance of the domestic banking system facilitate effective and efficient conduct of monetary policy. The CBN undertook a review of the monetary policy strategy and came up with the establishment of the monetary policy rate (MPR) which operated within an established "corridor". This is an attempt to address the challenge of the volatility of the interest rates while the exchange rates had achieved convergence and stability. In order that the financial sector integrated efficiently, there was the challenge of integrating the money market with the foreign exchange market. In the money market, the endogenous variable is the interest rate (price of money) which drives the new monetary policy framework. The exogenous variables to the money supply are the price level and the level of real GDP. These variables which are determined outside the money market and treated as known values create a challenge to foreign exchange management, particularly during the period of Federation Account Allocation when there is excess liquidity that drives demand at the foreign exchange market. This is so because the foreign exchange market is endogenous to the domestic interest rate, the foreign interest rate and the expected changes in exchange rate. The values of goods and services in the real sector determine the domestic and foreign rates of returns which affect the equilibrium of the exchange rate. Consequently, these interplays create a challenge in determining and choosing the right exchange rate. The second challenge through the dynamics of the money market is the use of the standing facility by the domestic money banks (DMBs). The DMBs used the standing facility to buy foreign exchange from the WDAS window or to lock up deals on Swap on the foreign exchange end of the market. This was a challenge as the information technology (IT) that was installed to alert operators that there are switches in the banks deposits and demand for payments of winnings at the WDAS window or the locking of Swap with foreign exchange was not functional. The challenge was that of filtering the demand from the money market through trending of the currency rate movement. Currencies have tendency to trend and so when the "corridor" moves, the exchange rate would move too because technically trained traders can easily identify new trends and breakouts and can

easily transit from money market to foreign exchange market. The forex market tends to develop strong trends because the FX market is driven by macroeconomic fundamentals (trends) that can take years to play out. Most currency pairs will trend at one point or another but only for a defined period of time. The key to trend trading is TIMING i.e identifying when a currency pair is trending and thus using technical indicators (that is the "corridor" which is exogenous to forex market) to capitalize on the move early when a currency pair is not trending and/or avoiding trending strategies. In order to address the challenge created by the new monetary framework, the forex market used the "corridor" as established with the understanding of the foreign interest rates (the pair currency) to gauge the strength of the trend and choose the right exchange rate. This is operationally done by the position of the dealers influenced by the following variables:

Amount on offer;
Prevailing exchange rate;
Expected changes in exchange rate;
Tenor to which the bank rate relate; and
Interest rate emerging along the corridor for various instruments

The challenge of the "corridor" is the filter defined as the process through which money market dynamics provide information to foreign exchange market participants (operators and regulators alike).

(ii) The Fiscal Policy and the Issue of Negative List

The complementarity of fiscal policy with the monetary policy has no doubt increased financial sector stability. In the last five years (since 2002) we have observed a reduction in fiscal deficit financing by the CBN and there had been consistency in the fiscal management of the government. This development has reduced financial fragility by reducing volatility of key relative prices in the economy, contributing to the development of banking system and stability of the exchange rate. However, there is still a long list of prohibited items which the fiscal authorities are trying to reduce but for the inconsistency in the administration of the tariff and other customs related issues. The long list of prohibited items drives demand for forex in the parallel market thus increasing the arbitrage of the exchange rate which had achieved convergence. The challenge is that the convergence begins to move in conical divergence and when it gets to a level above 5%, the market will be classified as dual exchange rate management. However, since the beginning of the year and with the effective implementation of Destination Inspection, and the

Common External Tariff policy, Government has reduced the negative list.

(iii) Streamline Policy Making, Regulation and Supervision

The consolidation of banks demands that there should be a good process to streamline other policies that are tangential to the financial sector stability of which FX market is a key process. The WDAS take-off was supported with establishing the Net Open Position Limits (NOPL) for the banks which was put at 10% of their capital base at the beginning of the WDAS and has since moved to the maximum of 20% of the capital base as demanded by international best practice and to also ensure that banks have room to trade in the onshore FX market without unnecessary exposures. However, the challenge of streamlining policy is the fact that the operators and the regulators are not moving in tandem to ensure efficient and effective implementation of the financial sector policies. The regulation and supervision of the banks still remain a challenge that could create a slip of the achieved foreign exchange stability. This is because the supervisors who are to conduct risk-based supervision are just getting out of the pressure of the consolidation exercise. This in itself is abused by the operators of the deposit money banks who create slippages in the supervisory and regulatory process. We have observed in recent times the turbulence in the global financial market. Nigeria, which is currently not affected because of the de-linked factor of non-convertibility of the currency, must begin to learn the ropes such that it matches the global development with efficient legal framework and institutional responses to any shocks whatsoever. Within this context is the issue of risk management and enforcement. The increasing sophistication of financial markets carries high inherent risks that must be adequately addressed. There is an increasing awareness internationally that the concept of self-regulation needs to be complemented through strong regulatory regime and credible enforcement as well as adequate risk management system and tools. This must also include mechanisms of investor compensation and market stabilization during times of stress in the markets.

V. Conclusion and the Way Forward

Since the take-off of WDAS, the CBN has been intervening mainly through spot transaction and selling to the accounts of the banks. Two methods of intervention had emerged. First is the weekly spot intervention and the second is the two-way quotes operated daily where the bank can and do call for quotes and vice versa for the CBN. This second approach is to ensure that the exchange rate that emerge do not suffer misalignment. Factors considered in operating this method include market liquidity conditions, transaction turnover and market psychology.

We have observed that the intervention policy adopted to ensure choosing the right exchange rate varied as regards both timing and magnitude, to avoid predictability. Foreign currency intervention is not announced to the public until the day of the auction while information regarding volume, strategy and timing are the reserve of the CBN. Finally, continuous and close monitoring through offsite and onsite supervision of foreign exchange transaction is crucial.

The way forward is to encourage the proposed brokerage for the BDCs to ensure that we lock in the gains made thus far. The proliferation of the BDCs is a challenge and the large inflows driving the exchange rate to appreciation could be abused if the operations of the BDCs are allowed with all the observed lapses.

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Exchange Rate Policy Design: Choosing the Right Exchange Rate Response in a Changing Environment

*Prof. M. I. Obadan**

I. Introduction

The exchange rate is an important macroeconomic policy instrument. Changes in exchange rates have powerful effects on tradables and non-tradables of the countries concerned through effects on relative prices of goods and services. Changes in nominal exchange rates most likely affect inflation rates. Because of the importance of exchange rates, policymakers in most countries worry about the behaviour of both nominal and real exchange rates and take active interest in their determination. Indeed, the choice of an exchange rate regime coupled with the 'right' level of the exchange rate tends to be, perhaps, the most critical decision in an open economy. This is because of the impact of the exchange rate on economic performance, resource allocation, the wealth of citizens, standard of living, income distribution, the balance of payments and other economic aggregates. Also, the choice of exchange rate policy very much determines the ability of a developing country, for example, to take full advantage of the international trade system. A wrong exchange rate policy can turn out to be very expensive. Historical factors, structural and economic characteristics of an economy, institutional factors as well as developments in the external environment are among the factors which condition a country's choice of an exchange rate regime from among the popular regimes of clean floating and firmly fixed exchange arrangements and the intermediate regimes of various sorts.

In the context of the various exchange rate regimes, this paper discusses the choice of exchange rate response in a changing environment, with a particular focus on Nigeria's exchange rate choices. To provide the conceptual framework, Section 2 focuses on the different types of exchange rate regimes and their features. In Section 3, we discuss the factors which condition the choice of exchange rate regimes by countries. Section 4 examines Nigeria's exchange rate response in a changing environment, in particular, the present environment of deregulation, with emphasis

* *Prof. Obadan is of the Department of Economics, University of Benin. The views expressed herein do not represent the views of the institution to which he is affiliated or those of the Central Bank of Nigeria.* *The author acknowledges the comments and suggestions of anonymous reviewers.*

on monetary and price stability and, possibly, inflation targeting framework. The final section contains brief concluding remarks.

II. Conceptual Framework-Exchange Rate Regimes

Exchange rate regimes refer to exchange rate arrangements or systems by which the value of the home currency is determined vis-à-vis foreign currencies. Various forms of exchange rate regimes are open to individual countries. The options range from clean floating or flexible arrangements at one extreme to firmly fixed arrangements at the other extreme, with the remaining regimes falling in a continuum in between, as variants of the fixed exchange rate or floating rate. These include managed float, pegs, and target zones.

Fixed Exchange Rate Regimes

A fixed exchange rate system is one in which exchange rates are maintained at fixed levels. Each country has its currency fixed against another currency. It may seldom be changed (hard peg) or changed occasionally (adjustable peg).
Nigeria maintained fixed exchange rates from the time of attainment of political independence in 1960 till the breakdown of the Bretton Woods monetary system in the early 1970s.
Two major reasons why fixed exchange rates are appealing:

- to promote orderliness in foreign exchange markets and
- certainty in international transactions. Developing countries for the most part in the past, have favoured a pegging arrangement in order to obtain medium-term advantages of greater certainty about the exchange rate faced by traders, especially in view of the greater importance of trade relative to capital flows in their balance of payments (Crockett, 1987: 87).

(a) Firmly Fixed Exchange Rate Regimes

These are also known as hard pegs. Once again, they tended to become increasingly popular in the aftermath of the East Asian financial crises.
Main argument in favour of a hard peg is the need to make monetary policy credible. It is contended that if you cannot build credibility for monetary policy at home, then you can presumably import it by fixing the value of your currency to a hard-money country (Velasco, 2000: 3). Related to this is the alleged ability of hard pegs to induce discipline, whether fiscal or monetary.
Three varieties of firmly fixed exchange rate regime are:

- currency boards
- dollarisation
- monetary union

(i) Dollarisation

In dollarisation, a country adopts as its own currency the currency of a "hegemon", or dominant economy. This means that the currency of another country circulates in the country as the sole legal tender (formal dollarisation).

In 2000, Ecuador adopted the U.S dollar as its legal tender.

Adopting such a regime implies the complete surrender of the monetary authorities' independent control over domestic monetary policy

(ii) Monetary Union

In a monetary union, a group of well-integrated economies adopts a single currency and coordinate monetary policy. This means that the same legal tender is shared by the members of the Union.

The CFA Zone in Africa, for example, is made up of two currency unions, the West African Economic and Monetary Union (WAEMU) and the Central African Economic and Monetary Community (CAEMC), each with its own central bank that issues its own currency with a fixed parity to the euro.

Both currencies are called the CFA franc. But they are distinguishable and not freely interchangeable, except via the euro convertibility that is guaranteed by the French treasury, which holds at least 65 per cent of the pooled reserves of each area.

As in dollarisation, a monetary union implies the complete surrender of the monetary authorities' independent control over domestic monetary policy.

(iii) Currency Boards

These are monetary arrangements based on an explicit legislative commitment to exchange domestic currency for a specified foreign currency, at a fixed exchange rate, combined with restrictions on the issuing authority to ensure fulfillment of its legal obligation. This implies that domestic currency will be issued only against foreign exchange.

Essentially, a currency board combines three elements: a fixed exchange rate between a country's currency and an "anchor currency", automatic convertibility, and a long-term commitment to the system, often made explicit in the central bank's law. Under a currency board arrangement, the central bank commits to exchanging a unit of domestic currency for a larger, more stable foreign currency at a fixed exchange rate as Argentina did with the U.S dollar from the late 1990s.

The arrangement requires that the domestic currency be issued only against foreign exchange and that it be fully backed by foreign assets. This leads to

the main reason for countries to consider a currency board, namely, to demonstrate that they are pursuing an anti-inflationary policy (Gulde, 1999: 37).

Modern currency boards have often been instituted to gain credibility following a period of high or hyper-inflation.

A currency board is credible only if a country's central bank holds sufficient official foreign exchange reserves to cover at least its entire monetary liabilities, thereby assuring financial markets and the public at large that every domestic currency note is backed by an equivalent amount of foreign currency in the official coffers.

And to be able to do this as well as have a successful peg requires, as Mishkin (2000: 354) has argued, an independent central bank, a sound financial system, and a strong fiscal position.

The notable advantages of a currency board are economic and monetary credibility, low inflation, low interest rates than would otherwise prevail, following from zero expectations of devaluation.

Also of note as strength of the currency board system is the virtual removal of the nominal exchange rate as a means of adjustment. But, according to Fischer (2001), this is also its major weakness, for adjustment to an external or internal shock via differential inflation is slower than via the nominal exchange rate.

In general, currency boards can prove limiting, especially for countries that have weak banking systems or are prone to economic shocks. With a currency board in place, the central bank can no longer serve as a lender of last resort for banks in trouble. This, however, can be compensated by the creation, typically with fiscal resources, of a banking sector stabilization fund.

Besides, with a currency board arrangement, it is not possible to use financial policies i.e., adjustments of domestic interest or exchange rates, - to stimulate the economy. Instead, economic adjustment can be achieved only through wage and price adjustments, which can be both slower and painful.

In other words, a currency board arrangement, featuring a stable exchange rate, entails the loss of power by the authorities to conduct independent monetary policy, control monetary aggregates and serve as a lender of last resort. This involves real economic costs in terms of unemployment, stagnant output and low demand that may result as was the case in Argentina.

In sum, as Velasco (2000) has observed, the essence of a currency board is that it limits the ability of the authorities to extend domestic credit. This may be good for preventing inflation, but it can be bad for bank stability.

(b) Other Conventional Fixed Peg Arrangements

Also known as currency peg. In this case, the country (formally or de facto)

pegs its currency at a fixed rate to another currency or a basket of currencies.

Single Currency Peg

The local currency may be pegged to that of a dominant trading partner. But most pegging countries tend to peg to the U.S dollar, being the major currency in international finance and it is an easy and simple standard for people to understand.

Pegging to a single currency may yield a number of advantages:

- Reduction in exchange rate fluctuation between the focus country and the country to which it is pegged. This facilitates trade and capital flows between the two countries, particularly as uncertainties associated with changes in exchange rates are reduced.
- Confidence in the developing country's currency may be enhanced if the country whose currency is being used for the peg is regarded as following economic policies conducive to stable prices. In this case, in order for the pegging country to maintain the level of the peg, it must also follow policies which will maintain stable prices.

Drawbacks of a single currency peg.

- Where the local currency is pegged to a floating currency, e.g. the US dollar, the local currency will float along with the dollar vis-à-vis other currencies. This means movement of the value of the pegged currency along with that of the dollar whether or not that movement is appropriate for the economy concerned.
- Movements in the exchange rate in relation to the currencies of the other countries may interfere with domestic policy (macroeconomic) objectives.

Pegging to a Basket of Currencies

In an attempt to stabilize its effective exchange rate, the developing country may peg its currency to a basket of currencies where the basket is formed from the currencies of major trading or financial partners and weights reflect the geographical distribution of trade, services or capital flows.

There is no commitment to keep the exchange rate irrevocably fixed. The exchange rate may fluctuate within narrow margins of less than ± 1 per cent around a central rate or the maximum and minimum value of the exchange rate may remain within a narrow margin of 2 per cent for at least 3 months.

The monetary authority stands ready to maintain the fixed parity through direct intervention (i.e., via sale/purchase of foreign exchange in the market) or indirect intervention (e.g., via aggressive use of interest rate policy, imposition of foreign exchange regulations, exercise of moral suasion that

constrains foreign exchange activity, etc).
Often, pegging to a basket entails the weighted average of several currencies, the resulting exchange rate being total trade-weighted, export-weighted or import-weighted.

Advantages

The country that pegs to a basket may be able to avoid large fluctuations in its exchange rate with respect to several trading partners' currencies. As a result, it is able to stabilize its nominal effective exchange rate.
The system results in the reduction of price instability which arises from exchange rate changes.

Some Disadvantages

Technical difficulties of implementing a peg which would in general change on a daily basis vis-à-vis all of the industrial countries (Barth, 1992: 38).
A basketweighted exchange rate which, by definition, moves against all major currencies, might reduce confidence on the part of foreign investors and reduce capital inflows.
The determination of the exchange rate without reference to the domestic policies of the pegging authorities is a notable limitation.
In general, flexibility of monetary policy, though limited under the fixed peg arrangements, is greater than in the case of exchange arrangements with no separate legal tender and currency boards because traditional central banking functions are still possible, and the monetary authority can adjust the exchange rate.

(c) Crawling Peg

A middle course exchange rate arrangement between fixed and flexible exchange rates. It is appropriate for countries that have significant inflation compared with their trading partners, as had often been the case in Latin America.
The monetary authorities fix the exchange rate on any day but periodically adjust it in small amounts at a fixed rate or in response to changes in selective quantitative indicators such as past inflation differentials vis-à-vis major trading partners, the differential between the inflation target and expected inflation in major trading partners, etc.
The rate of crawl can be set to generate inflation adjusted changes in the exchange rate (backward looking), or set at a pre-announced fixed rate and/or

below the projected inflation differentials (forward looking).

Advantage of this type of peg is that it combines the flexibility needed to accommodate different trends in inflation rates between countries while maintaining relative certainty about future exchange rates relevant to exporters and importers.

One disadvantage is that the crawling peg leaves the currency open to speculative attack because the government is committed on any one day or over a period to a particular value of the exchange rate.

Another is that maintaining a crawling peg imposes constraints on monetary policy in a manner similar to a fixed exchange peg system.

Exchange rates can, however, operate within crawling bands. In this case, the currency is maintained within certain fluctuation margins of at least ± 1 per cent around a central rate or the margin between the maximum and minimum value of the exchange rate exceeds 2 per cent and the central rate or margins are adjusted periodically at a fixed rate or in response to the changes in selective quantitative indicators.

The degree of exchange rate flexibility is a function of the bandwidth. Bands are either symmetric around a crawling central parity or widen gradually with an asymmetric choice of the crawl of upper and lower bands (there may be no pre-announced central rate in the latter case).

However, constraints are imposed on monetary policy, given the commitment to maintain the exchange rate within the band. The degree of policy independence is a function of the bandwidth.

(d) Target Zone

Related to the above. It is another compromise between floating rates and fixed but adjustable rates, and is a popular regime.

Under it, a central rate that can be fixed, crawling or flexible is surrounded by a band within which the central rate is permitted to float.

This regime allows for flexibility among a country's policy objectives. It is also said to prevent extreme movements in the exchange rate.

Note: most of the above regimes fall into the category of adjustable peg exchange rates a system in which a national currency is pegged to a key currency, e.g., U.S dollar, but the level of the peg could be changed occasionally, albeit within a narrow band.

Floating Exchange Rate Regimes

A freely floating exchange rate system or flexible exchange rate system is one

in which the exchange rate, at any time, is determined by the interaction of the market forces of supply of and demand for foreign exchange.

- The exchange rate so determined by the market may change from day today or even minute to minute.

In the light of this, the system, in principle, allows a more continuous adjustment of the exchange rate to shifts in the demand for and supply of foreign exchange and, hence, avoids the difficulty of determining the appropriate level of the rate as is the case under a fixed exchange rate system or a basket peg.

Thus, the basic case for flexible exchange rates is that if prices move slowly, it is faster and less costly to move the nominal exchange rate in response to a shock that requires an adjustment in the real exchange rate.

- The alternative is to wait until excess demand in the goods and labour markets pushes nominal goods prices down. That process is likely to be painful and protracted.

The degree of flexibility of the exchange rate depends on the nature of government intervention.

- A **clean float** or independent float results where the government does not intervene in exchange rate determination to establish its level. Any official foreign exchange market intervention is aimed at moderating the rate of change and preventing undue fluctuations in the exchange rate.
- A **managed float** results where the government intervenes in the foreign exchange market in order to manipulate the exchange rate to a desired rate.
- However, the monetary authority may also attempt to influence the exchange rate without having a specific exchange rate path or target. Indicators for managing the rate are broadly judgmental (i.e. balance of payment position, international reserves, parallel market development), and adjustments may not be automatic. Besides, intervention may be direct or indirect.

The managed float approximates what obtains in reality. The clean float is academic as it does not exist in the real world. Even the industrialized countries practice floating with different degrees of government intervention. Even the United States the cleanest of the floaters intervenes in the foreign exchange market occasionally in light of the implication of high volatility of clean floats.

Thus, one question relating to floating is not whether to float freely, but what kind of 'dirty float' to have. Should there be a monitoring band? Some countries seem to have this in practice.

Unlike a fixed exchange rate system which results in changes in the level of foreign exchange reserves and the monetary base, a floating exchange rate system equilibrates the demand for and supply of foreign exchange by changing the exchange rate rather than the level of reserves.

- And because the monetary base is not affected by foreign exchange flows under a flexible exchange rate system, a country has the freedom to pursue its own monetary policy without having to be concerned about balance of payments effects.
- And so, external imbalances would be reflected in exchange rate movements under a floating rate system instead of reserve movements, with monetary implications under a fixed rates system (Barth, 1993: 38).

However, some concerns about floating exchange rates have been expressed:

- That repeated depreciations only cause inflation without real effects. However, exchange rate flexibility, if properly managed can be stabilizing.
- Increased variability in exchange rates may have adverse consequences for capital inflows, particularly if foreign investors also are concerned that exchange rate flexibility may reduce a country's willingness to follow restrained domestic monetary policies.
- Presence of foreign debt may contribute to financial fragility.

For success, though, a flexible exchange rate system requires complementary policies which can take different forms: counter-cyclical fiscal policy, prudential regulation, capital controls, etc.

And in a managed float, the authorities should be able to intervene if the exchange rate "strays too far" from the perceived medium term equilibrium.

III. Important Factors in the Choice of an Exchange Rate Regime

The Factors

The choice of an exchange rate regime is subject to considerations that are both economic and political and involve current conditions as well as expected future development and development strategies.

A country's stage of development, its economic structure and its institutional features are important considerations in determining the choice of an exchange rate regime. Historical factors also play a role.

In general, a number of characteristics and factors to consider are as follows:

- Structure of production and export reliance on primary commodity production and exports (minerals and agricultural crops) in relation to manufactured exports. The former is more subject to external shocks

than the latter.

- Source and nature of economic shocks and the authorities reactions to such shocks
- State of development of financial markets.
- Openness of the economy and its integration with the global economy
- Dependence on the external sector for essential imports, particularly intermediate goods and capital equipment
- The extent of substitutability of domestically produced goods for imports
- Significance of capital flows, including foreign direct investment and official and private lending.
- Options that exist in terms of monetary unions with trading partners
- The monetary authorities' preferred approach to disinflation.

A few of these factors are elaborated upon as follows:

i. Openness

In the context of the theory of optimum currency areas, fixed exchange rates have been recommended for small open economies open to international trade.

- It is generally considered that a small, open economy may find it more advantageous to peg to the exchange rate of a much larger trading partner.
- And if it chooses to peg, its economic structures would need to be aligned with those of the anchor area and its labour market should be flexible. This is because pegs put more onus on wages and prices.

On the other hand, large economies, or small economies subjected to shocks uncorrelated to those buffeting the country to whose currency they might have pegged were advised to choose flexible exchange rates.

- Corker, Beumont, Elkan and Lakova (2000) report that Poland's exchange rate flexibility is in keeping with its relatively large size, lower degree of openness, and its less flexible labour market.
- However, a number of small open economies have been reported to have had successful experiences with exchange rate flexibility; often coupled with inflation targeting, e.g., Australia, Chile, Colombia, Israel, New Zealand, Sweden (Velasco, 2000: 8).

ii. Economic Shocks

Where the country is buffeted by large real shocks from abroad, the case for adoption of flexible exchange rates is often very strong. If shocks to the goods market are more prevalent than shocks to the money market, then it may be

much more desirable to have a flexible exchange rate compared to a fixed exchange rate.

If shocks buffeting an economy are significantly large (technically, if their variance exceeds some threshold), then fixing the exchange rate is not welfare improving.

In contrast, if the inflation bias that occurs under discretionary monetary policy is large enough, then flexible exchange rate system is not welfare enhancing.

Generally, foreign real variability is likely to be particularly large for exporters of primary products and/or countries highly indebted abroad. In the face of the shocks, particularly negative output and price shocks, greater variability is required to allow the nominal exchange rate to play its role to facilitate the shift to a new internal and external equilibrium.

- In other words, the nominal exchange rate should move to adjust relative prices to the new equilibrium level, after a shock has rendered the old array of relative prices obsolete.
- If prices move slowly, it is faster and less costly to move the nominal exchange rate in response to a shock that requires adjustment in the real exchange rate.

Finally, even in some small countries that may be more subject to asymmetric shocks, such as changes in exchange rate regimes and in countries lacking product diversity, a decline in terms of trade, the authorities may need more flexibility to deal with the shocks (Cordon, 2001: 45).

iii. State of Development of Financial Markets

Rudimentary and underdeveloped financial markets make it difficult to operate a floating exchange rate.

- Major industrial countries have allowed their currencies to float, taking cognizance of the highly developed state of their financial markets and the difficulties that would arise if they attempted to maintain a given exchange rate in the face of substantial short-term capital flows.

In the presence of underdeveloped financial markets, with a limited number of foreign exchange dealers, countries may adopt pegs of various forms in the early phases of market development.

- Currency union or hard pegs to a strong currency could be adopted as a way to develop the financial markets through integration.
- Indeed, underdeveloped financial markets and extreme lumpiness of foreign exchange earnings (especially aid inflows and earnings from

dominant export commodities, e.g. oil in Nigeria) provide good reasons to manage floats more tightly than in the more developed and diversified economies.

Thus, in the context of developing countries, particularly the poor ones, a further deepening of financial markets might make it easier to operate flexible exchange rates.

In general, there are, at least, three conditions for the successful management of a flexible exchange rate, in terms of delivering low and stable inflation at the same time as the exchange rate works as a real shock absorber. They are:

- existence of a foreign exchange market with some minimum depth and efficiency
- a domestic anchor for monetary policy
- minimum independence and capability of the central bank in order to be able to deliver an effective monetary policy.

iv. Importance of Capital Flows

In the context of open capital accounts of the balance of payments, a flexible exchange rate policy is indispensable. Capital controls liberalisation aids capital inflows which put pressure on the exchange rate. Uncertainty from a flexible exchange rate system may discourage short term capital inflows while market participants are made to bear exchange risk instead of the balance sheet of the central bank bearing it.

Under a fixed exchange rate regime, capital inflows will, in the absence of sterilization, either because it is costly or ineffective, put downward pressure on interest rates and upward pressure on the money supply thereby potentially conflicting with inflation objectives.

- But a degree of exchange rate flexibility would raise the exchange risk premium, helping to dampen interest sensitive, and often destabilizing capital flows.

Economies open to international capital flows have been and are in the process of moving away from adjustable peg exchange rate system, some towards harder pegs, but more towards systems with greater flexibility (Fischer, 2001). The reason, it is argued, is that soft pegs have not proved viable over any lengthy period, especially for countries integrated or integrating into the international capital markets.

In Czech Republic and Poland, changes from more or less controlled exchange rate regimes occurred largely under pressure of capital flows.

- While the Czech Republic was forced to abandon its exchange rate band under extreme market pressure, Poland widened its band and

later abandoned fluctuation bands in stages in the context of persistently large inflows of capital (Corker, Beumont, Elkan and Iakova (2000: 6).

In the same way, the experiences of Mexico and East Asian countries during their financial crises in the 1990s illustrate the risks of open capital accounts in the face of less flexible exchange rates. Short-term debt proved to be dangerous in the case of Mexico. It has also proven to be risky in the case of East Asia.

However, a flexible exchange rate system may be highly volatile with many consequences.

- In the light of this, managed floats, in combination with prudential capital controls, can do much to prevent large swings in capital flows, thus making an important contribution to macroeconomic stability.
- Even then, recent experience has shown that managed floats are vulnerable to large accumulations of short-term external investment (UNCTAD, 1998).
- It is therefore necessary to introduce occasional flexibility by widening the exchange rate band. This could help to eliminate one-way bets and discourage arbitrage outflows.

Pre-Requisites for Adopting Firmly Fixed Exchange Rate Regimes

Just like in the case of flexible exchange rates, there are a number of conditions underpinning the adoption of hard pegs.

- Satisfaction of optimum currency criteria. This means that small countries are better candidates than large countries. Also, pegging to a country subject to very asymmetric real shocks is likely to create problems.
- The bulk of the trade of the country adopting the peg takes place with the country or countries to whose currencies it plans to peg.
- Preferences about inflation of the pegging country must be broadly similar to those of the country to which it plans to peg.
- Flexible labour markets are crucial. This is because with the exchange rate fixed, nominal wages and prices must adjust in response to an adverse shock.
- As a hard peg prevents the central bank from serving as a lender of last resort to domestic banks, strong, well-capitalized and well-regulated banks are indispensable.
- For countries with weak central banks and chaotic fiscal institutions, hard pegs are very necessary. But in opting for a hard peg, the

government must adhere to its own set of rules governing monetary policy. Laws cannot be changed by fiat.

In the light of the foregoing, it is clear that there is no single correct time-independent answer that can be given on the choice of an exchange rate regime. Historical factors along with institutional factors and the economic characteristics of the economy play important roles.

- The domestic policy orientation as well as the degree of the integration of the local economy are also important factors in choosing any of the intermediate exchange rate regimes between the polar arrangements of firmly fixed exchange rates and clean floating.

IV. Nigeria's Exchange Rate Response in a Changing Environment

The evolution of Nigeria's exchange rate policy/regimes has reflected the changing environments of regulation of economic activities/administrative control, oil boom, deregulation/structural adjustment programmes and, currently, the focus on greater liberalization.

Evolution of Exchange Rate Policy

During the period of exchange control that prevailed up to 1986, ad hoc administrative measures were applied.

- The exchange rate regime operated from the late 1950s up to 1973 was generally in consonance with the IMF par value system.
- The Nigerian currency, not being a traded currency, had its exchange rate largely subjected to administrative management.
- The currency maintained a fixed parity with the pound sterling up to 1967 and U.S dollar up to 1970. Thus, the exchange rate policy was largely passive as it was dictated by the fortunes or otherwise of the U.S dollar or British pound sterling (Obadan, 1993:3).
- Following the breakdown of the Bretton Woods monetary system and the emergence of a system of generalized floating from 1973, Nigeria decided from April, 1974 to implement an adjustable peg exchange rate system in which the naira was to be managed independently of the U.S dollar and other currencies, although it was pegged to them through administrative action.
- Effective from February, 1978 the naira was pegged to a system of import-weighted basket of currencies of seven major trading partners of Nigeria.
- Against the backdrop of oil boom, the nominal exchange rate appreciated every year in the 1970s excepting 1976 and 1977. The

bilateral and real effective exchange rates also appreciated in the 1970s (Obadan, 1994).

In the first half of the 1980s, the domestic environment for policy making was greatly affected by the crash of prices in the international crude oil market earlier in 1981 and the resultant shortfall in foreign exchange earnings coupled with the emergence of serious balance of payments and external debt crises. This paved the way for the monetary authorities to embark on a policy of gradual depreciation of the naira nominal exchange rate.

But the administrative depreciation of the naira did not prove capable of removing the perceived over-valuation of the currency. Some measures of the real effective exchange rate still showed significant average real appreciation during the 1981-85 period.

Consequently, the second-tier foreign exchange market (SFEM) was introduced on September 26, 1986 within the framework of the structural adjustment programme (SAP).

Thus, from 1986 till the present day, the SAP philosophy of liberalisation and deregulation has provided the framework for operating a managed float exchange rate regime in Nigeria.

In Nigeria and some other developing countries, the primary factors leading to the adoption of the market based foreign exchange arrangement were the perception that the previous administrative system for allocating foreign exchange had broken down and that the market-system would lead to a more efficient allocation, including more effective provision of foreign exchange for critical inputs.

The evolution of a realistic exchange rate was thus a key expectation from the new exchange rate regime.

Nigeria has used a composite of both inter-bank and auction system to manage the exchange rate. The objective of both, however, is to establish an exchange rate that will move flexibly to equilibrate demand for and supply of foreign exchange and, thus, reduce dependence on exchange and trade restrictions.

The Medium-term Outlook of Exchange Rate Management

As at now, Nigeria is one of the many developing countries that operate a managed floating system. It is not clear if this is in the context of a clearly pre-determined path for the exchange rate.

Perhaps, in the bid of the monetary authorities to maintain relative exchange rate stability, Nigeria is reported to have successfully operated a ± 3 per cent fluctuation band in 2005 within the framework of its managed float (Gudmundson, 2007: 7)

Two policy environments that have been created/are being created and which are consistent with a floating exchange rate regime are capital account liberalisation and inflation targeting framework.

Inflation Targeting

From January 2009, a new environment/framework for exchange rate policy is to be introduced, namely, inflation targeting. This intention was made known on August 14, 2007 by the Governor of the Central Bank of Nigeria when he unveiled the "Strategic Agenda for the Naira". The CBN would use the period before the effective implementation date to prepare for it in view of the technicalities involved.

Discussing the right exchange rate regime for Nigeria has to be in the context of the monetary policy framework and other factors.

Under a floating regime, a major task of the monetary authorities is to find and implement a suitable monetary policy anchor as the exchange rate is no longer available for this purpose.

The choices for nominal anchor boil down to two, namely, monetary aggregates or inflation targeting.

- In monetary aggregate anchor, the monetary authorities use their instruments to achieve a target growth rate for a monetary aggregate, such as reserve money, broad money supply or narrow money supply. The targeted aggregate becomes the nominal anchor or intermediate target for monetary policy
- Inflation targeting involves the public announcement of medium-term numerical targets for inflation with an institutional commitment by the monetary authority to achieve the targets.
- The framework has the important features of increased communication with the public and the markets about the plans and objectives of monetary policy makers and increased accountability of the central bank for attaining its inflation objectives.
- In inflation targeting framework, exchange rate movements are automatically taken into account to the extent that they are expected to affect future inflation. Accordingly, this will generally produce a pattern of monetary tightening when the exchange rate depreciates.

Compared to monetary aggregates as anchor, inflation targeting has turned out to be most popular among emerging market economies for a number of reasons (Velasco, 2000: 11):

- Given the instability of money demand in most economies, targeting monetary aggregates is neither theoretically optimal nor easy to

handle in practice.

- Inflation targets may also prevent the time inconsistency problem that leads to an inflation bias, while avoiding the pitfalls of fixed exchange rates.
- Inflation targets may also have some of the attributes of hard pegs, in particular, transparency and observability.

And, in principle, inflation targets can deliver less inflation volatility than a monetary policy centred on a monetary or exchange rate targets (Corker, et al, 2000). In practice, however, this may not be so because:

- any discretionary policy is open to political pressures;
- the technical requirements to forecast inflation and understand the lags in the response of the economy to changes in monetary policy instruments can be considerable;
- further complications arise where the country has to dismantle all capital controls

Nevertheless, inflation targeting can be successful where:

- there is freedom from commitment to another nominal anchor like the exchange rate or wages;
- there is ability to carry out a substantially independent monetary policy, especially one not constrained by fiscal considerations

In the light of the CBN Act (2007) which urges the Bank to ensure monetary and price stability, it has given an indication that over the medium term, low and stable inflation will be the primary long-term goal of monetary policy in Nigeria.

Capital Account Liberalisation

The second major policy framework to consider in discussing the right exchange rate for Nigeria over the medium term is the status of capital account liberalisation.

- Nigeria's capital account is largely liberalized and relatively open, and this is consistent with a floating exchange rate regime of some sort.
- Over time, particularly since the 1990s, there has been a systematic reduction of restrictions on capital flows into the economy with the following measures, among others (CBN Annual Report, Dec. 2006).

✓ foreign investors are allowed to invest in government bonds and securities of not less than one year maturity, subject to the issuance of a certificate of capital importation (CCI) by the processing bank;

✓ foreign investors are allowed to invest directly in equity as well as in the capital market through a broker but are to obtain a CCI as evidence of such

investment. In all these, the investor is guaranteed unrestricted repatriation of proceeds;

- ✓ Foreign investors are allowed to extend loans to private Nigerian entities without restrictions. However, such loans are without government guarantee.
- ✓ With effect from March 2006, Nigerian residents are allowed to invest in foreign currency-denominated securities subject to repatriation of the proceeds from such investment;
- ✓ Holders of both ordinary and export proceeds domiciliary accounts are guaranteed unrestricted access to the use of their funds.
  - Thus, as at 2006, the following capital and financial account transactions have been liberalized: capital transfers, direct investment and other investment. Portfolio investment is partially liberalized, the only restriction being the prudential requirement that investment in money market securities must be for a maturity period of at least one year.

A Hybrid Approach

In the light of the above policy frameworks, the fact that the Nigerian economy, as an oil dependent economy, is subject to possible severe shocks, a freely floating exchange rate would be suggestive.

- But given the nature of Nigeria's foreign exchange market which is dominated by the central bank, in terms of supply of foreign exchange, and considering the pass-through effects of exchange rate on inflation, there is the need to continuously manage the exchange rate.
- Also, for sometime now, the exchange rate has achieved some stability. Given the public's fixation on this, coupled with the exchange rate's importance politically, the Central Bank would need to lead the market in line with changes in economic fundamentals.

Specifically, one possible solution to the issue of avoiding too much and little exchange rate variability is to adopt a hybrid approach whereby weight is given to both inflation and the exchange rate.

- In this direction, formal or informal bands for the exchange rate, assuming they are not too narrow, could provide additional reassurances that the authorities will avoid potentially large swings in the exchange rate that would be inconsistent with the goals of low inflation and external sustainability.
- In other words, in the context of a managed float, there should be an understanding (as there may already be, given the path of the naira

over the last few years) that the CBN will lead the naira through gradual changes in line with economic fundamentals, while resisting unwarranted volatility.

- And under the inflation targeting framework, intervention in the foreign exchange market will be necessary to smoothen excessive volatility in the exchange rate.

V. Conclusion

This paper has briefly examined the evolution of exchange rate policy in Nigeria and dwelt on the exchange rate outlook over the medium - term against the background of the policy frameworks of capital account liberalization and inflation targeting. Before then, the various types of exchange rate regime were reviewed and the conclusion is reached that the choice of any particular regime depends on many factors. These factors include the structure and features of the economy, the external environment it faces including the nature and sources of shocks, stage of development of the financial markets, openness of the economy and significance of capital flows, institutional and historical factors. The domestic policy environment is also important. There is no single correct time independent answer to the question of choice of exchange rate regime.

Over the medium-term in Nigeria, and in the light of the prevailing/proposed policy frameworks of capital account liberalisation and inflation targeting coupled with the fact of the country's high vulnerability to external shocks through heavy dependence on crude oil exports, a freely fluctuating exchange rate regime is suggestive. However, this is not a desirable option considering other factors. Therefore, there is the need for the continuous management of Nigeria's floating exchange rate regime. In this direction, a hybrid approach may be adopted whereby weight is given to both inflation and exchange rate in policy calculations. To this end, formal or informal bands for the floating exchange rate may need to be adopted. This could prevent large swings in the exchange rate which would be inconsistent with the goals of low inflation and external sustainability.

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Towards Inflation Targeting Framework for Monetary Policy in Nigeria: The Challenges for Central Bank of Nigeria

*M. Hugman, Ph. D**

I. Introduction

This paper seeks to look at the challenges of moving to an inflation-targeting (IT) regime, specifically in Nigeria's emerging market environment. Part one outlines briefly the underlying mechanisms of inflation-management and general approaches to inflation targeting. Part two focuses on issues that specifically relate to IT in emerging markets, including the possible macroeconomic impact of the transition process. Part three considers the sequence and timing of the transition to IT in Nigeria, in particular on the shift in exchange rate management required to achieve long-term price stability. Additionally, Nigeria-specific challenges are also addressed. The paper concludes by noting that both the time frame and coordination for a successful transition will be considerable, and that the Financial Sector Strategy 2020 will be the critical vehicle for achieving this.

Fundamentals of Inflation Targeting

Inflation targeting has evolved in both academic literature and monetary policy practice over the last twenty years, in response to the failure of previous approaches to maintaining macroeconomic stability[1]. IT is based on the following macroeconomic principles:

1. Price stability must be the overriding goal of monetary policy, other economic trends and variables must be subordinate to this, when necessary.
   a. In the long-run, monetary policy cannot be used to solve real sector macroeconomic constraints.
   b. Persistent and volatile inflation (>15% year-on-year) will undermine all other economic policy aims.

** Dr Mike Hugman is a staff of Standard Chartered Bank Plc. (Nigeria). The views expressed are those of the author and do not represent the views of the institution to which he is affiliated or those of the Central Bank of Nigeria.* *The author acknowledges the comments and suggestions of anonymous reviewers.*

[1]Specifically, monetary policy based on the Philips curve in the 1970s following the end of the Breton Woods regime, and targeting of monetary aggregates in the 1980s.

c. Central Banks in small, open economies can only have one end-policy target/anchor.
d. These views are now broadly supported by both Monetarist and New Keynesian macroeconomic thinking.

2. Inflation is driven by factors that can be influenced by monetary authorities (expectations, real sector demand, exchange rates, money supply growth) and structural factors that are outside the influence of authorities (supply constraints, cost-push factors).
3. By building a credible reputation for giving primacy to inflation-management, and by developing a transparent, coherent framework for applying available levers of policy, the Central Bank can maintain stable prices with limited costs, through management of expectations and economic behaviour, except in the face of exceptional circumstances.

Mechanics of Inflation Targeting

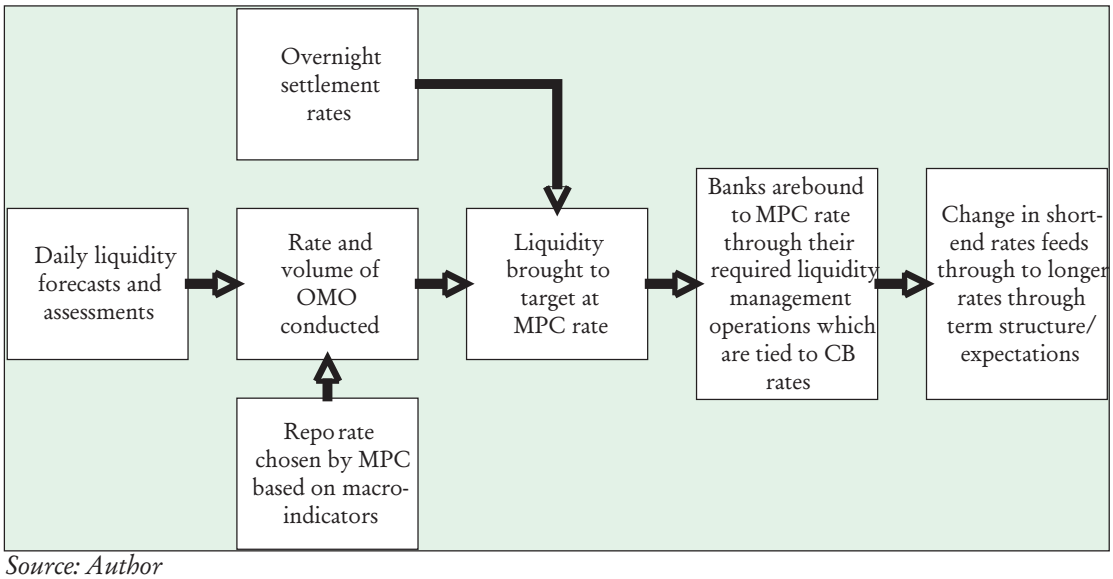
There is an ongoing debate in international economics as to what precise policy framework constitutes IT. The US Federal Reserve Bank, European Central Bank and Bank of Japan, all adhere to the broad fundamentals set out above, but have developed their own approach to monetary policy. In contrast, a core group of smaller, open economies (including the UK, New Zealand, Sweden, Canada) have developed a more formalised framework, which has been identified by the IMF as a preferred approach to monetary management, with the following components:

1. Grant operational independence to central bank-signals commitment to avoiding monetary loosening during political cycle (in response to issues of time inconsistency raised by Barro and Gordon, 1981 *inter alia*).
2. State a clear inflation target and tolerance range (including exact definition of inflation measure targeted).
3. Establish a transparent framework for generating and communicating inflation forecasts (covering data, model and key indicators).
4. Establish a monetary policy committee (MPC) with fixed membership, publicized voting structure and pre-announced meeting timetable.
5. Announce MPC decisions at a fixed time, release minutes of meetings of the MPC with a pre-announced lag.
6. Ensure that in the central bank's commitment to the principle of price stability, all monetary policy decisions and statements are unambiguous.

A critical pre-condition for inflation-targeting in developed economies is for the central bank to have an effective mechanism for influencing market interest rates

(both short and long-term). *Figure 1* sets out the basic process by which a number of central banks transmit monetary policy decisions to market rates[2]. Considerable effort is required to develop the architecture to manage daily market liquidity in order to ensure that the policy rate is reflected in the short end of the market.

Figure 1: Interest Rate Transmission Mechanism



Source: Author

[2]*This approach is not the only transmission mechanism available. The US Federal Reserve sets its policy rate as the Federal Funds rate, charged on mandatory reserve deposits made by DMBs to the Federal Reserve System.*

Secondly, and more fundamentally, changes in short-term rates caused by changes in the policy rate must feed through to the real economy, in order to provide the central bank a tool to control real activity and, therefore, prices.

Several channels are potentially available for rates to influence economic behaviour. *Ceteris paribus,* an increase in short-term interest rates will underpin an increase in capital inflows and, therefore, appreciate the nominal exchange rate. This will directly reduce the price of imported goods in the overall basket of goods in the short-run, as the consumption profile adjusts to new relative prices. This adjustment then leads to a relative shift away from domestic production, relaxing domestic price pressures.

An increase in interest rates can have a direct impact on both consumer and producer activity through variable rate lending and credit, which has an immediate impact in reducing the level of activity and, thus, reducing upward price pressures. Additionally, an increase in interest rates in the current period can have various effects on expectations of future economic activity, which can feed-through to consumer behaviour today and can further constrain firm investment choices through a changing credit environment[3]. These are further, more subtle ways that expectations play a key role in modern monetary policy.

For inflation targeting to be effective, and to establish strong credibility, there must be substantial and relatively rapid transmission through these channels to the level of consumer prices.

I. Challenges of IT in Emerging Markets

Clearly, from the framework we have outlined above, a variety of economic and policy pre-conditions exist in order for inflation targeting to deliver sustained price stability. However, emerging markets present a number of additional challenges, beyond those faced in developed countries, which can prevent the achievement of the key goals of IT. These emerging market constraints can include, although this list is by no means exhaustive:

1. Central banks remain under pressure to focus on real sector, developmental outcomes alongside macroeconomic stability, which compromise IT:

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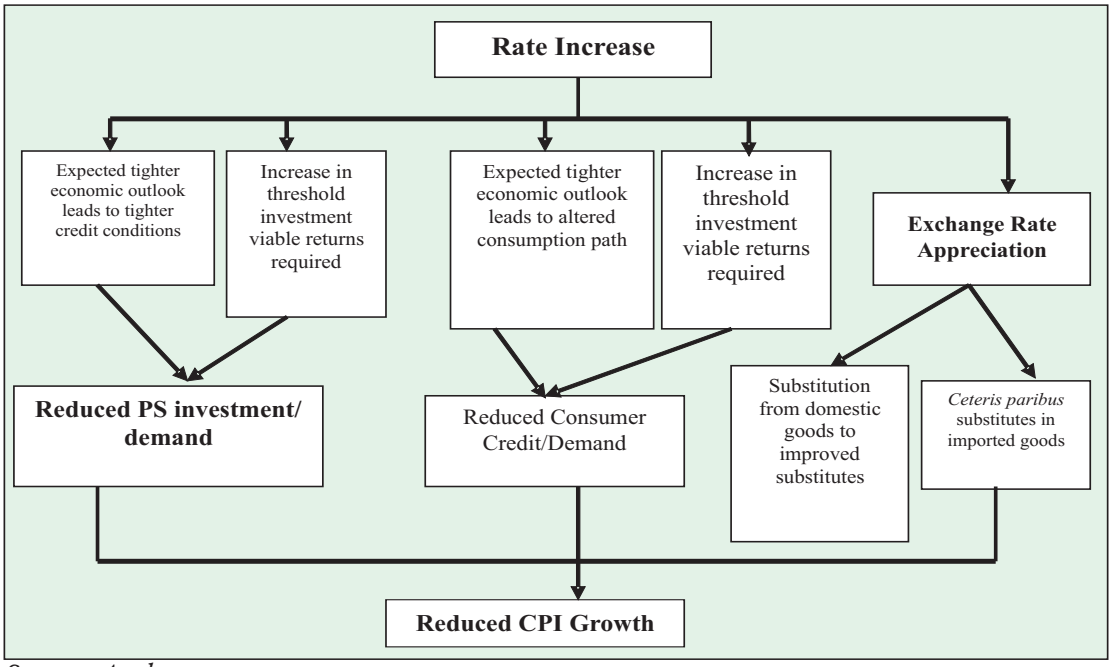
[3] *Bernanke and Gertler (1999) have described this channel as the 'financial accelerator'.*

Figure 2: Transmission Mechanism to Real Economy



Source: Author

a. Driving credit growth to private sector; and
b. Targeting real exchange rate outcomes to protect employment through external competitiveness authorities consequently subordinate price stability to targean alternative variable.

2. Coordination with fiscal policy authorities is critical expansionary fiscal positions, which remain too common in emerging markets, will prevent successful expectations management.
3. Fiscal costs of aggressive liquidity absorption can be a binding constraint where the overall fiscal space is limited.
4. Political difficulties often exist in emerging markets, (EM) around removing administered prices, which are often inflation linked and, therefore, contribute to backward-looking inflation inertia..
5. Greater vulnerability to terms of trade shocks in EM increase the threat of exogenous price shocks breaking hard-won expectations of stable prices[4].

[4]*Vulnerability to terms of trade shocks can come from several sources. Emerging markets have limited flexibility to deal with increases in the prices of manufactured goods or refined petroleum products, either through technology substitution or reduced price mark-ups. Equally, greater reliance on commodity exports for public revenues creates the threat of inflationary deficit financing in times of low primary export prices.*

6. Strong (public sector) unions can create inflation-wage feedback.
7. Shallow retail, corporate and mortgage lending limit impact of lending rate changes on real economic activity, undermining the transmission challenges set out above.

Market Risks Associated with Inflation-Targeting Transition

These specific, additional emerging market issues mean that the transition to inflation targeting in this environment may look fundamentally different from the relatively smooth shifts seen in developed countries over the last 15 years.

1. Institutional market rigidities (administered prices, indexed wages) may slow expectation adjustment longer transition period required with potential for sustained high short-end interest rates required to build credibility. Appendix 1 sets out the evolution of the yield curve during the transition to inflation targeting
2. Greater pressures to deliver on real sector, development goals prevent successful transition because of pressure to maintain expansionary monetary and/or fiscal policy
   a. **Risk of negative real rates** emerging out of failed IT transition, if rates are lowered before low inflation expectations are embedded.
   b. **Threat of currency crisis** if authorities completely liberalize the foreign exchange (FX) market but are not able to control inflation.
3. For countries with strong external positions, but weak interest feed-through, exchange rate appreciation may be central for initial price control. Generally IT implies **greater volatility in exchange rates** as central banks need to avoid targeting multiple policy goals
4. Authorities must take a much more proactive role in developing the financial system in order to create feed-though from policy rates, via market rates, to the real economy. Rapid credit expansion to the private sector must be combined with effective supervision to avoid fragility in the banking sector balance sheets.

Several emerging markets, in making the transition to an inflation targeting regime, have overcome these challenges. *Figure 3* sketches out the experience of Brazil. The move to inflation targeting in Brazil came as a result of the failure of the exchange rate peg in 1999, but importantly was predated by fiscal policy reforms which paved the way for primary surpluses, which have been critical for successfully maintaining the IT regime.

Having initially stated, and met, an inflation target in 1999 and 2000, a series of principally exogenous shocks forced inflation above the target zone for the next 3 years. These exogenous shocks, the 2001 real depreciation and the 2002-3 energy crisis, were exacerbated by internal rigidities such as administered prices. However, authorities maintained a tight monetary (and fiscal) stance in response, and supported by the commitment of the incoming administration, were able to regain control of expectations and bring inflation back within the target by 2004.

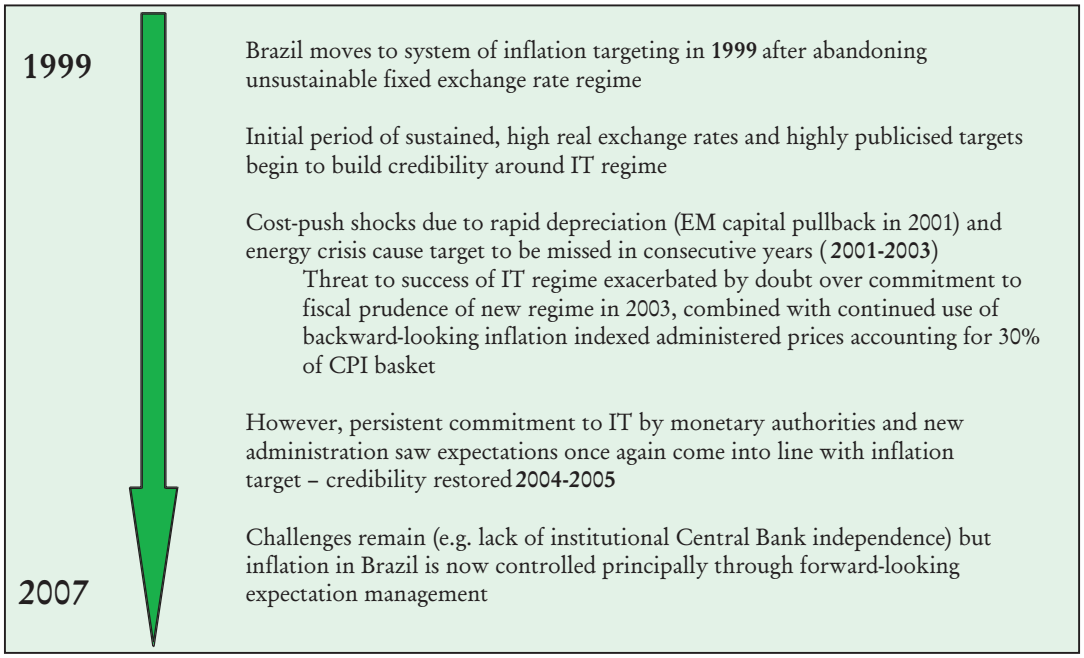
A number of key African economies have either explicitly or implicitly signaled their intentions to replicate the transition to inflation targeting seen in Brazil and other key emerging markets such as the Czech Republic and Israel. However, as we have seen above, frontier emerging markets such as those in Africa face a more challenging path to achieving a successful inflation targeting regime. *Figure 4* is a matrix capturing a set of economic policy-components that are collectively critical for an effective inflation-targeting regime to operate successfully. Several of these, such as inflation forecasting, MPC structure and communications, and the strengthening of feed-through channels, are essentially technical components of inflation targeting. It is somewhat surprising that many of the Central Banks have not made much progress in these areas, since they only face constraints from a technical viewpoint, which should be relatively easy to overcome.

A second, and distinct set of required IT components have a much greater policy element to them: central bank independence, exchange rate flexibility, removal of administered prices and fiscal-monetary coordination all require a much greater potential sacrifice on the part of the authorities, and thus present the greatest potential threat to successful transition.

We can identify from *figure 4,* two stylised facts about inflation management in Africa:

1. Principal challenges are around the more politically sensitive issues of removing administered prices, developing better monetary-fiscal coordination and allowing genuine exchange rate flexibility. Failure to address a combination of these issues will be critical not just in preventing effective transition to inflation-targeting, but potentially opening the economy up to serious macroeconomic instability, particularly around exchange rate volatility.

Figure 3: Case Study of a Successful Transition: Brazil



Source: Author

2. The second major area of weakness relates to the lack of depth in the financial architecture, which loosens the linkages between interest rates and prices via the real economy. Further, the potential for utilising liquidity-oriented intermediate targets such as reserve money supply also drastically reduces. The Central Bank has to balance the pressures to proactively support financial sector deepening without compromising banking sector stability to avoid scenarios such as Kazakhstan's recent banking crisis.

II. Establishing IT Decision-Making Framework in Nigeria

Initially, the Central Bank of Nigeria must focus on accelerating the development of the decision-making framework that underpins the inflation targeting regime. This step is politically straightforward, as it does not impinge on other government agencies and policy-makers. However, it will be a technically demanding process, and will require the Central Bank to further leverage its growing relationship with external technical advisers. In particular, the CBN must have a sustained and wide-ranging programme to develop modelling and technical research capacity, both through further in-house training and recruitment of additional personnel.

Figure 4: Ongoing Journey to Inflation Targeting in Africa

	South Africa	Egypt	Kenya	Ghana	Botswana	Mauritius
Expected timeframe to mature IT framework	In place	1-2 years	5+ years	3-4 years	2-3 years	4-5 years
Explicit inflation target	3-6%	Pending	No	<10%	4-7%	No
Central Bank Independence	Yes	Yes	Yes	Yes	No	Yes
Inflation Forecasting Framework	Yes	Improving	No	Yes	Yes	Improving
Predictable MPC process	Yes	Yes	No	Yes	No	Improving
Clear communication strategy	Yes	Improving	No	Improving	No	Improving
Policy rate with effective feed - through to market rates	Yes	Yes	Limited	Improving	Yes	Limited
Sufficient transmission channels between rates and real economy	Yes	Improving	Limited, via exchange rate	Limited	Limited	Limited
Pro-active use of other policy levers e.g. OMO	Where necessary	Where necessary	Limited	Yes	Where necessary	Improving
Flexible exchange rate focused on IT	Yes	Improving	No	No	REER target at odds with IT	Improving
Elimination in 'administered' prices	Yes	Improving	No	Electricity prices remain sticky	Not a challenge in Botswana	Improving
Substantive coordination of Fiscal and Monetary Policy	Yes	Fiscal deficit still problematic	No	Fiscal deficit still problematic	Yes	Limited

Source: IMF Article IV staff reports, Author

1. Demonstrate commitment to inflation target
   a. Central Bank must make dedicated announcement of transition to IT with timetable for all necessary components to be realized.
   b. Inflation target must be stated unambiguously
      i. Target inflation rate
      ii. Tolerance range
      iii. Specific inflation measure and CPI basket to be used
   c. Central Bank should indicate at commencement the various measures that will be taken in response to deviation from target
      i. Monetary policy levers that will be employed
      ii. 'Punishment' strategy for Central Bank in the event of deviation (New Zealand, UK)
   d. Central Bank operational independence is often viewed as a pre-

requisite for building 'tightening' credibility-this independence must be shown to operate in practice in Nigeria to be truly credible

2. Develop robust inflation forecasts
   a. Success of IT has been driven in most countries through management of expectations via forward looking inflation forecasts
   b. CBN will need to conduct research and modeling on:
      i. Underlying money demand and evolution of monetary structure (esp. if intermediate money supply targets are to be used)
      ii. Exchange rate feed-through and foreign exchange path
      iii. Policy-rate feed-through
      iv. Liquidity forecasting (including real sector growth forecasts)
   c. Deliver robust inflation forecasts and confidence intervals that will form the basis of both interventions and communications

3. MPC Structure and Communications is an area where Nigeria is already making substantial progress.
   a. MPC now has clear voting structure
   b. Meeting schedule should not be altered once set
   c. Clear rules should be set for timing and mode of communicating
      i. Revised inflation targets and other macroeconomic data
      ii. Monetary policy actions outside of MPC (e.g. OMO)
      iii. Decision of the MPC
      iv. Minutes of MPC
      v. Reasons for deviation from target (if any) and remedial action

Strengthening Transmission Mechanisms in the Nigerian Economy

In the long-term, the critical challenge for all emerging market monetary authorities will be to develop stronger transmission mechanisms for control of real sector activity. In the initial stages of inflation control, the exchange rate channel will be crucial as it will provide the most critical impact, but this will not present a long-term sustainable source of price control.

However, the deepening of rate-variable financial markets represents a balancing act for the Central Bank. Supporting credit growth through relatively loose liquidity may be necessary, but the CBN must be pre-emptive in strengthening supervision to avoid fragility threatening the banking sector as has occurred in other emerging markets (e.g. South East Asia up to 1997, Russia up to 2000 and most recently Kazakhstan).

More fundamentally, the Central Bank must ensure that credit growth focused on strengthening transmission channels does not drive emergence of the same inflation that monetary authorities are seeking to control.

1. Effective Monetary Policy Rate

a. Rate regime must be stable - changes must be well publicized to avoid uncertainty over future approaches to rate setting
b. Rate regime must be appropriate to market environment and must have influence over short-end market rates - many Central Banks exploit a combination of channels to influence market rates
    i. Repo rate signals overnight rate a fixed period ahead
    ii. Lending/deposit corridor provides additional guidance
    iii. Alternative (e.g. US) to use direct reserve requirements

2. Further Development of Liquidity Instruments

c. Continued deepening of markets for open market operations (OMO) and foreign exchange (FX) sales/swaps in order to maximise ability to reduce liquidity - build credibility amongst market participants
d. Novel additional options - inflation-linked notes and bonds signal Central Bank's commitment to inflation target - costs incurred if inflation is allowed to rise by CBN
e. Policy framework that strengthens liquidity can be guided to ensure that overnight rate converges to Central Bank's repo rate

3. Continued Linking of the Real Sector to Money Markets

f. Reform payment systems- ATMs, Credit cards
i. Reduces cash-holding in the economy, places more money in banking system where rates have an impact on decisions
g. Increase interest-bearing formal credit sources
    1. Business loans
    2. Mortgages
    3. Personal borrowing

Rate changes impact on spending/investment/savings decisions

h. Support banking system to develop effective credit market
i. Rate increases should start to signal slower growth and consequently limit firm access to credit. Further provide credit decisions based on firm fundamentals.

4. A Flexible Exchange Regime is Crucial for Effective Inflation Targeting

j. Rate changes will also have an influence through changes in the exchange rate
   i. Rate increases will not only affect prices through credit, investment and expenditure channel
   ii. This effect will be particularly strong in Nigeria where imports/GDP ratio is 39% (with non-hydrocarbon imports at 25% of GDP)

k. Ultimately, the aim should be a flexible rate:
   iii. Periods of external strength will naturally drive appreciation and moderate inflation
   iv. Flexible depreciation will ensure that inflation remains in relative equilibrium with inflation in trading partners' countries through long-run purchasing power parity.

l. If intermediate regime is required
   v. import-weighted crawling peg to ensure import-price pass through does not threaten inflation through disequilibrium with trading partner inflation

m. Avoid targeting real effective exchange rate for competitiveness - twin targets are not credible in the long-term.

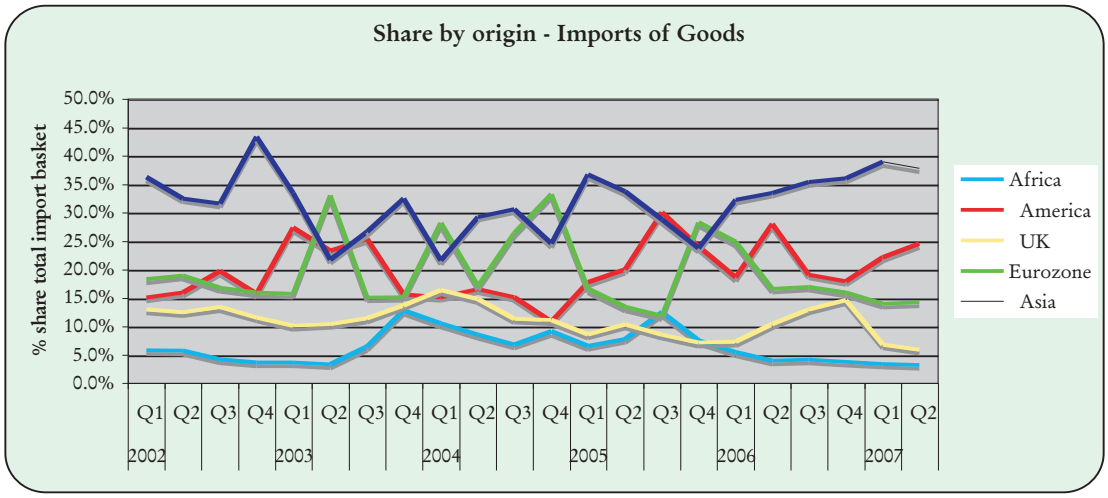
5. A Flexible Exchange Regime is therefore a Critical Long-Term Target for the CBN

n. Timetable for liberalization - distinguish categories of FX transaction

o. Current account should be liberalized as quickly as possible in line with IMF Article VIII as non-liberalization is believed to distort economic activity

p. Capital account can be liberalized gradually by imposing ceilings for different types of flows and relaxing limit over time
   i. Non-resident transactions should be liberalized
   1. Annual portfolio flow are net less than 1% of foreign reserves
   2. Non-resident listing is vital to vision of being African financial hub
   ii. Resident transactions might remain subject to restrictions
   1. Outwards FDI subject to supervision

Figure 5: Nigeria: Basket of Imported Goods, Value By Origin 2002 - 2007



Source: National Bureau of Statistics, Author

6. Timetable for Liberalization

The Central Bank must liberalize current and capital accounts in a manageable sequence over time to match financial sector development. Regular assessments of banking sector vulnerability should be made, particularly during the liberalization of the capital account, to ensure ongoing stability.

Figure 6: Timetable for Current and Capital Account Liberalization

	Q4 2007	Q2 2008	Q1 2009	Q4 2009	Q3 2010
Current Account	Begin complete liberalization	Finish complete liberalization			
Capital Account - Non-res		Begin gradual liberalization	Assess gradual liberalization	Finish gradual liberalization	
Capital Account - Resident			Begin gradual liberalization	Assess gradual liberalization	Finish gradual liberalization

Source: Author

Specific Nigerian challenges

The Central Bank of Nigeria, in looking to transit to inflation targeting, will face a number of challenges that are particularly pronounced in the Nigerian economy. We focus here on two specific issues-chronic structural barriers to price stability and the role of fiscal policy makers. Overcoming these will demand specific policy solutions tailored to the Nigerian environment.

1. Structural Constraints on Price Stability

a. These can prevent supply curve from responding to price dynamics and deliver efficient allocation of goods
b. In countries such as Nigeria, this may not be due to under-supply in the economy as a whole, but because of inefficient distribution in the market
   i. Failure of spatial arbitrage-poor and costly transport prevents goods from reaching areas of high demand despite high prices at a given point in time, and over-supply in other areas.
   ii. Failure of temporal arbitrage-poor and costly storage/preservation prevents supply of goods from being spread over time, despite over-supply in some periods and under-supply in others.
c. These market failures create an additional challenge of managing different inflation dynamics in segregated sub-economies.
d. Inflexible input and production costs create downward price rigidity
   i. Power
   ii. Water
   iii. Limited pool of surplus qualified labour
e. The overall solution to structural constraints must target fundamentals
   i. Forcing too much additional liquidity into banking system without addressing financial architecture constraints to lending will not on its own produce greater real sector investment
   ii. Increased lending/risk management capacity in the banking sector must be matched with political will and private sector capacity to finance and deliver critical infrastructure

2. Coordination of Monetary and Fiscal Policy is essential in all emerging markets, but particularly where hydrocarbons dominate government revenue

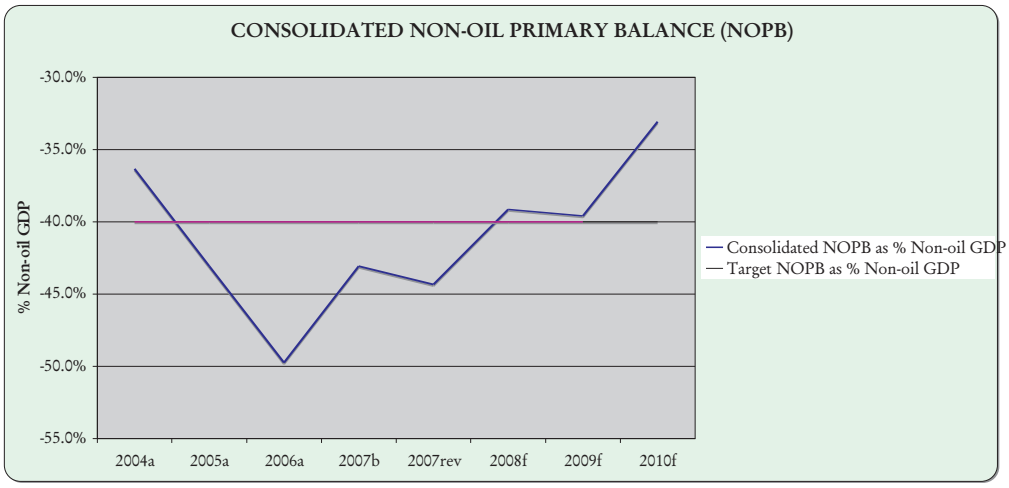
f. In 2008, consolidated government spending will be 30.9% of Gross

Domestic Product (GDP) and 58.5% of non-oil GDP.

i. Fiscal dominance remains the paradigm for monetary management
ii. Fiscal performance will determine overall liquidity

g. The balance of oil and non-oil revenue used is crucial due to highly inflationary nature of natural resource flows (75-80% of the Federation Account Allocation Committee (FAAC) inflows in 2008 will continue to be from hydrocarbons)
   i. Non-oil primary balance target of 40% of non-oil GDP remains a critical measure of fiscal prudence

Figure 7: Consolidated Non-oil Primary Balance 2004 - 2010

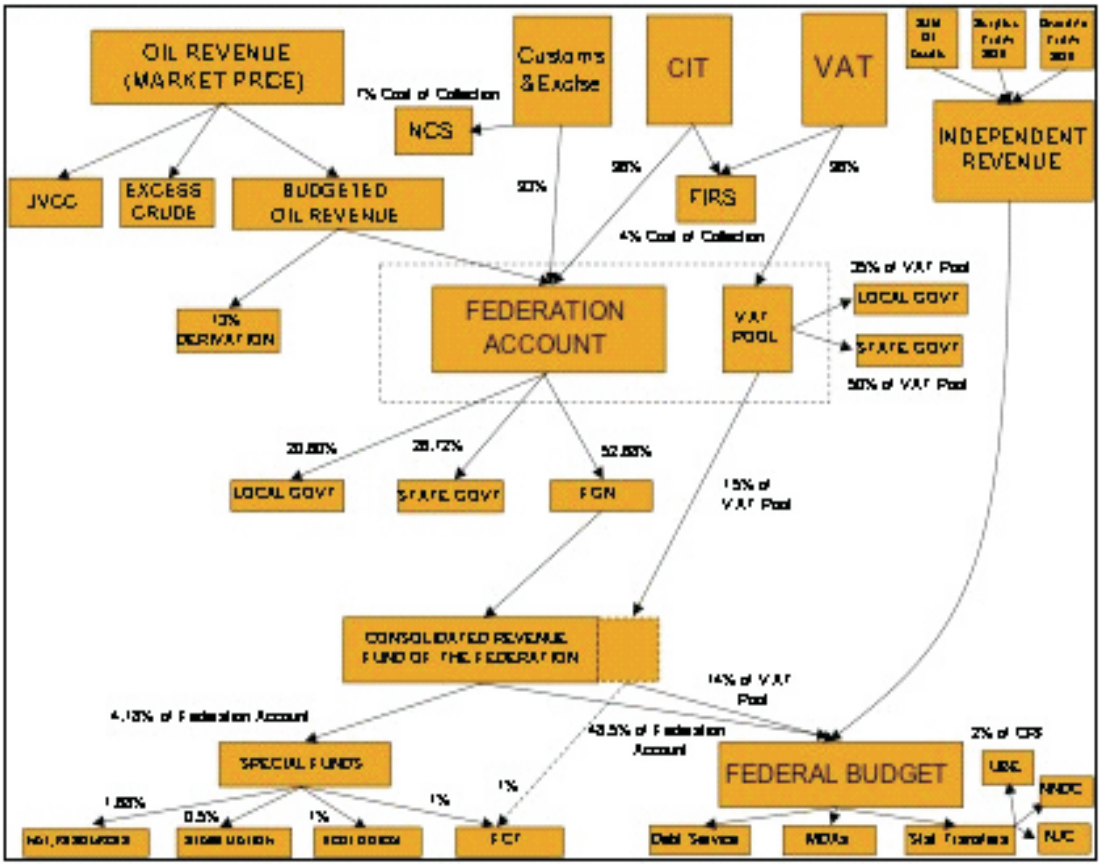


Source: Federal Government of Nigeria 2008 Fiscal Strategy Paper

h. The correct balance of recurrent and capital expenditure is also critical in supporting inflation control
   i. Recurrent funds will be dispersed more predictably, but will be utilised at a higher level and exhibit much more rapid pass-though
   ii. Capital expenditure will be required to alleviate structural constraints on prices - cannot be achieved through incremental recurrent spending

i. Effective coordination in budget implementation must be driven by fiscal policy authorities, who must focus on developing *and sharing* greater technical capacity in forecasting spending patterns
   i. *Ex-ante* cash-flow planning must be developed and then more strictly adhered to by fiscal authorities
   ii. Forecasting and tracking of monthly revenue and expenditure with analysis of deviations and likely future outcomes on a 3-month horizon. This becomes much more difficult when sub-national government has to be factored in, which is critical in Nigeria.

Figure 8: Nigerian Federation Flow of Fiscal Funds

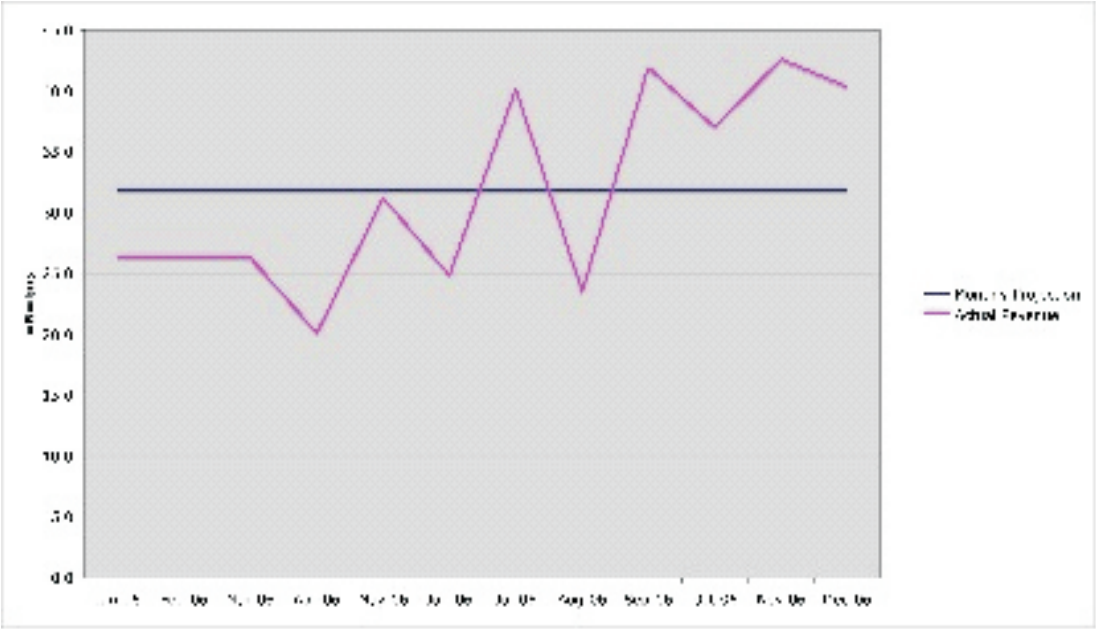


Source: Author

j. Historically, Nigeria has relatively volatile revenue inflows. This is true of both oil revenues, particularly petroleum profit tax (PPT) and royalty payments, and also non-oil revenues. *Figures 9 and 10* below show monthly revenue incomes for two key streams in 2006, both of which are lumpy and unpredictable in nature. Better understanding and projecting of these flows are essential to understanding not just cash-flow from a government spending perspective, but also for pre-empting withdrawals of liquidity from the banking sector as tax payments are made.

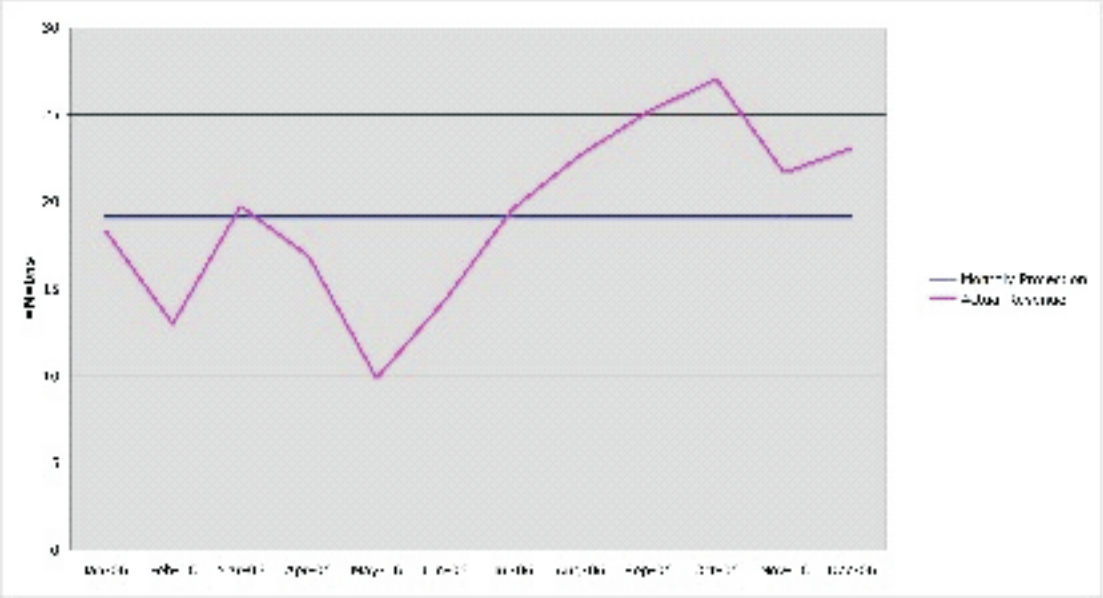
k. Brazil again provides a key example of the importance of fiscal policy in achieving stable price management (IMF working paper WP/05/109).
   iii. Brazils move to inflation targeting in 1999 was supported by a series of well publicized, credible fiscal reforms.
      1. Reorganization of sub-national debt (1997)
      2. Wide-ranging FRB to address persistent budget deficits (2000)

Figure 9: Nigerian Oil Royalty Payments 2006 (Monthly)



Source: Accountant - General of the Federation, Author

Figure 10: Nigerian Corporate Tax Receipts 2006 (monthly)



Source: Accountant - General of the Federation, Author

i. As a result, the primary surplus has become a key determinant of inflation expectations.
   1. For every additional 1% primary consolidated surplus, inflation expectations 12 months ahead fall by 1%.
   2. Impact of fiscal surplus on inflation expectation strengthened over time as credibility was developed.

l. Deficit financing in Nigeria has receded as an immediate source of fiscal policy destabilization of monetary aims, but this issue must continue to be actively addressed going forward, given the prominent role it has played historically in driving inflation.
   i. It is critical that seignorage or 'ways and means' financing remains a non-option for any fiscal activity.
   ii. Domestic borrowing.
      1. Sensibly structured domestic borrowing programme can help to absorb longer-term liquidity and reduce systemic pressure.
      2. Government can continue to provide risk-free reference yield curve.

iii. External borrowing
    1. Must deliver efficient returns in reducing structural constraints of prices and competitiveness.
    2. Must minimize Government exposure this reduces incentives to manage exchange rate due to the impact on sovereign balance sheet.

m. Tax policy can play an increasingly important role in supporting long-term price stability goals, and in Nigeria there is a need to ensure that tax reform strategies take monetary policy into consideration
    i. Balance of taxes (oil and non-oil) will determine feed-through of changes in fiscal stance to system liquidity. Current tax reforms, whilst targeting lower rates, aim to increase total revenue through greater compliance. This will moderate domestic liquidity growth.
    ii. Fiscal incentives to develop infrastructure and encourage financial market deepening are a critical complementary approach to private sector credit expansion, if this is to be translated into reduced supply side constraints.

n. Fiscal authorities must publicly commit sufficient funds to allow credible OMO whenever required

o. Long-term fiscal policies in Nigeria must ultimately complement the aims of the Central Bank of Nigeria to support rapid, but sustainable growth of the economy.
    i. Establish 'primary surplus' credibility through repetition of prudent fiscal policies
    ii. Target limits on recurrent budget to prevent imbalance of spending.
    iii. Fiscal authorities must take the lead in relaxing infrastructure constraints.
    iv. Seek out new sources of funding for infrastructure.
    v. Coordinate private sector activity within strong regulatory framework.

IV. Conclusion

This paper draws a number of conclusions for long-term monetary policy strategy in Nigeria, and the transition to inflation targeting. First, it is clear that inflation-targeting remains a fluid and evolving concept, without a one-size-fits-all framework that can be easily adopted. Second, emerging market Central Banks face a range of challenges in implementing such an approach to monetary policy, which can prevent a successful transition unless directly addressed. This paper has highlighted a

number of such challenges that are particularly prevalent in the Nigerian context.

Given these clear conclusions drawn from our descriptive analysis, the Central Bank of Nigeria must recognise that the move to inflation-targeting must be gradual, carefully planned within a coherent overarching framework, and done in complete coordination with other key economic management agencies. Without such a coordinated approach, the announced transition may not have the desired impact on prices, a problem encountered in several other emerging markets. The Financial Sector Strategy 2020 provides the ideal vehicle, and timeframe, in which to locate the necessary holistic approach to delivering this new monetary policy framework. Consequently, inflation-targeting must be at the heart of the FSS 2020 process.

Appendix 1

Implications for the yield curve during a transition to IT in EMs

This annex develops a scenario for the likely impact of a long-term transition to inflation targeting on the key characteristics of the yield curve. In order to establish entrenched expectations of price stability, Central Banks in emerging markets must be prepared to tighten monetary policy for a sustained period.

Before IT is adopted

Inflation often persistent at higher levels, and acts as a break on growth (particularly when over 15% year-on-year and volatile)
Also, greater volatility of inflation introduces possibility of negative real rates
Yield curve is overly responsive to monetary policy decisions at both the long and short ends
Authorities (both fiscal and monetary) have more latitude to vary policy, introducing additional risk that imposes a premium on all categories of economic transactions

During the transition to IT

Tighter initial short-term monetary policy combined with effective moderation of longer-term inflation (and therefore rate) expectations will lead to a broadly predictable evolution in the yield curve:

Figure A1: Initial Impact of Transition to IT on Yield Curve

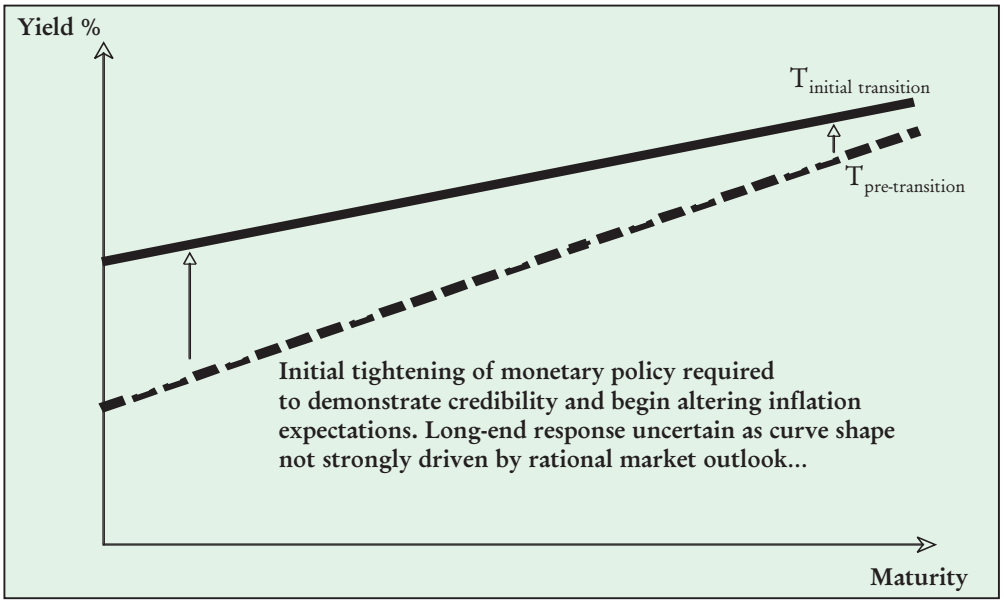


Figure A2: Yield Curve Following Change in Long-Term Inflation Expectations

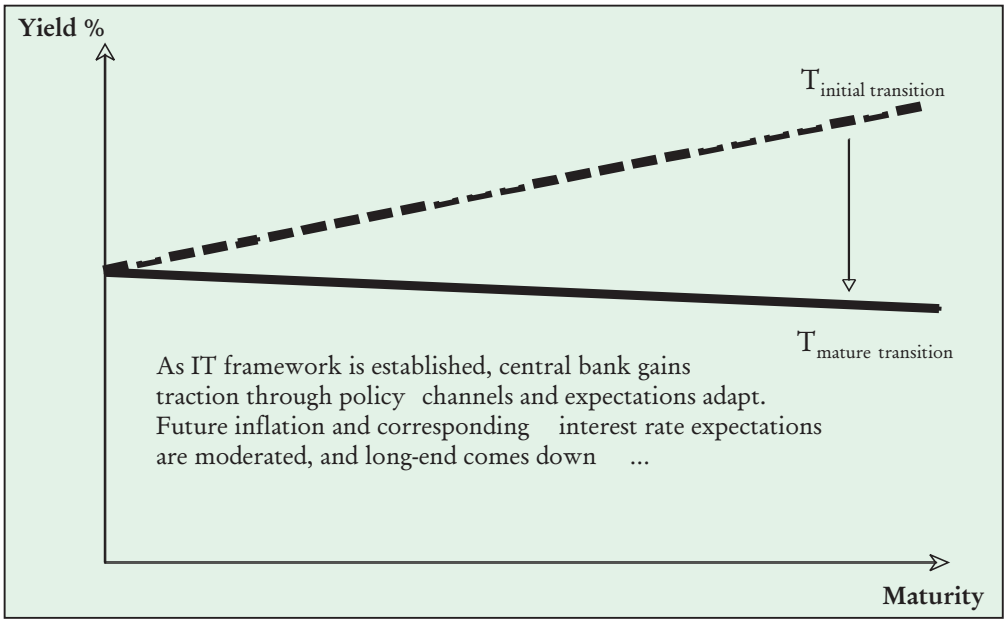


Figure A3: Yield Curve Under Effective IT

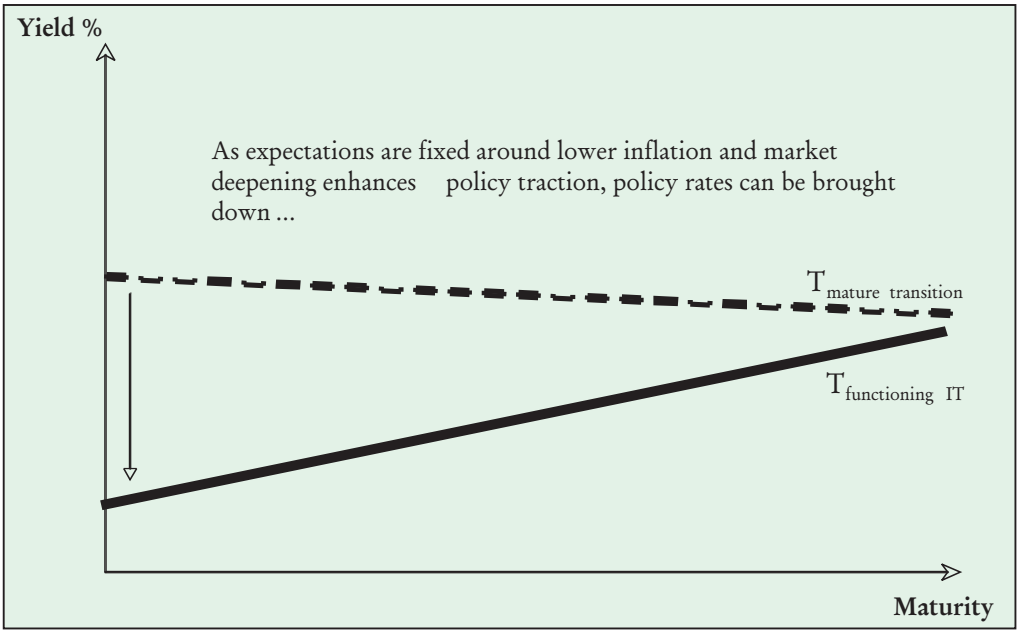
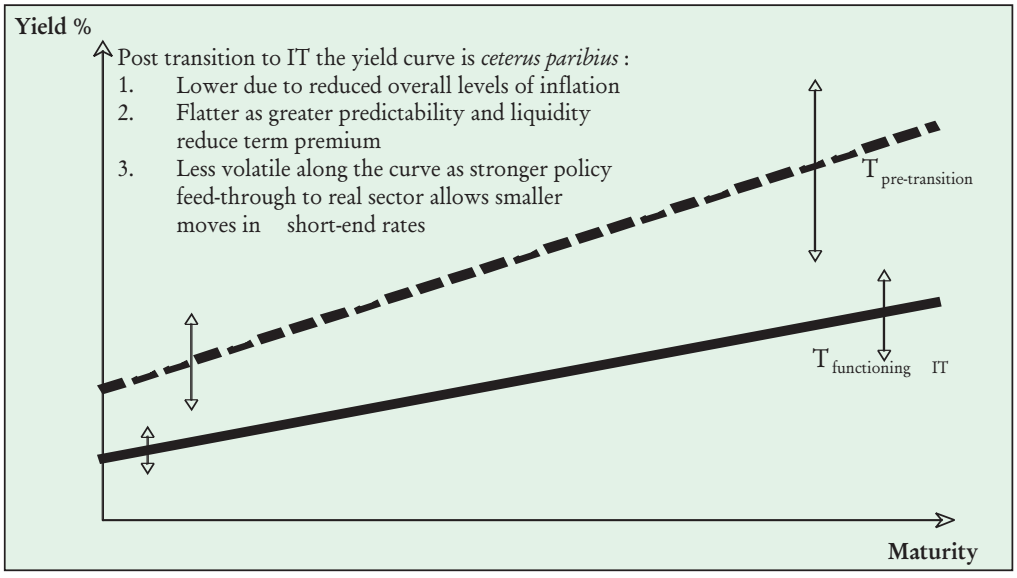


Figure A4: Yield Curve Characteristics Before and After Transition



As credibility develops, increased transparency in both the targets of the monetary authorities and greater public availability of data, should increase rationality of markets and reduce volatility in response to monetary policy decision

Market development, supported by authorities to increase interest feed-through, should have positive impact on depth of financial system:

1. Growth of retail credit market
2. Development of mortgage and other asset-backed lending (providing environment for subsequent MBS/ABS)
3. Introduction of repo framework enabling more efficiency liquidity management but also facilitating position-based trading
4. Greater market liquidity will moderate term structure along yield-curve

After IT regime is in place

1. Low, stable rates of inflation anchor broader macroeconomic stability
2. Enhanced predictability and greater information reduce country risk
3. Yield curve behaviour underpinned by conventional expectations formation and economic events

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Inflation Targeting as a Tool of Monetary Management: International Experiences

*A. F. Odusola Ph. D**

I. Introduction

Central banks across the globe have the traditional mandates of ensuring the stability of the value of their respective domestic currencies and the normal functioning of the internal and external payment systems. A framework for achieving these mandates is through price stability as reflected in low and stable inflation sustainable over time. For a long time, price stability has become an important goal of monetary policy. In recognizing the central role of price stability in achieving the primary responsibility of central banking, inflation targeting has increasingly assumed a significant role in monetary policy management. Inflation targeting (IT), is referred to as the main medium to long run goal of monetary policy. This is based on the premise that high and variable inflation rate is socially and economically costly while short run manipulation of monetary policy to achieve the ultimate goals of output and employment could conflict with price stability goal.

This new approach of controlling inflation through monetary policy, *inflation targeting*, is one of the orthodox approaches of monetary management. However, monetary authorities' focus on ensuring price stability recognises their powers and limits regarding inflation's influence over the rest of the economy. Monetary policy, in the long run determines inflation and other nominal variables (e.g., monetary aggregates, nominal interest rates, and nominal exchange rates). However, its powers to methodically and steadily influence real variables such as output, employment, investment, relative prices (e.g., real exchange rate, real wages and real interest rate) are very limited. But, in the short run, it is a powerful instrument for stabilizing business cycles. Monetary policy does influence the value of real variables by cushioning the volatility of output and employment when shocks occur. Monetary policy under inflation targeting has countercyclical influence by reducing the volatility of inflation and output.

**Dr. Odusola is a National Economist at the United Nations Development Program (UNDP). The views expressed herein do not represent the views of the Institution to which he is affiliated or those of the Central Bank of Nigeria.* *The author acknowledges the comments and suggestions of anonymous reviewers.*

This approach to monetary policy management has been the mostly debated and increasingly being adopted over the past two decades in advanced, transition and developing countries. While only 8 countries adopted the approach in the early 1990s,[1] 54 countries had adopted explicit inflation target by 1998 (Agenor, 2000). Since then, the rate of adoption is becoming widespread.

Several factors have motivated the increasing adoption of inflation targeting (IT) as a tool of monetary policy management-exchange rate crises, money demand instability, and the need to avoid social and economic costs of high and volatile inflation (Svensson,1997 and 1998; Agenor, 2000; and Odusola 2006). The hallmark of adopting this framework is the urge to improve transparency of monetary policy making process as well as to ensure policy credibility. As a nominal anchor for monetary policy, its increasing adoption is also premised on its simplicity, maintaining public and explicit commitment to economic management discipline, improving inflation predictability, clarifying communication, accountability and transparency[2] coupled with need to reduce inflation variability (Galindo et al, 2005). Announcing inflation targets to the public in a more transparent and accountable way has been argued to be the best guarantee against policy mistakes as well as to obviate shortcomings associated with inherent monetary policy discretion. Monetary policymaking would be devoid (or reduce to a large extent) of personal and ideological considerations.

Other benefits associated with the adoption of inflation targeting include: improving the output-inflation trade off, reducing output variability, reducing inflation bias inherent in discretionary policy regime. It is a tool of overcoming credibility problems because it mimics incentives for performance contract and it also allows policy makers to respond more flexibly to economic shocks. IT lengthens the yield curve arising from the gradual extension of the maturities of fixed income instruments while it also contributes to solving the dynamic consistency problem

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[1] *New Zealand was the first country that introduced inflation targeting as an explicit strategy of monetary policy in 1989. Within a period of one year it became more popular in such central banks as the Bank of Canada, the Bank of England, Sweden Riksbank and the Reserve Bank of Australia) and later spread to emerging countries (e.g., Brazil, Chile, Israel, Korea, Mexico, South Africa, the Philippines and Thailand). This policy framework is now popular even among transition economies like the Czech Republic, Hungary and Poland (Odusola, 2006).*

[2] *Results from inflation targeting have shown that countries that were able to achieve improved transparency also experienced greater form of central banks independence that are accompanied by enhanced accountability.*

(Clifton et al, 2001; Svensson, 1998 and 1999; Knight 2007). As further argued by Bernanke (2003), it serves as a tool for anchoring the private sector's expectations for future inflation while Keleher (1997) argues that it allows price system to work more effectively. Keeping inflation close to zero has an advantage of limiting the microeconomic costs and tax distortions caused by inflation[3]. The fact that inflation targets are now public information, will contribute to the stabilization of economic markets such as the short and long-term money markets, foreign exchange market, equity and commodity markets (JEC, 2005). In practical sense, the main motivation is the direct benefits of price stability for economic efficiency and growth (Odusola, 2006).

In spite of these potential benefits, IT has, however, been criticized on a number of grounds. The inability of the approach to address serious ills of the economy-poverty, employment and inequality- for instance, has been a major source of attack (Esptein, 2005). IT has been criticized for its inability to simultaneously bring about a more stable asset price environment (Fildaro, 2004); and achievement of price stability with increasing asset price bubbles and financial instability (Borio and White, 2004). Despite the criticisms that trailed the implementation of IT, as enumerated above, no country that adopted the strategy had abandoned it. Even in countries where asset prices reacted negatively to the strategy (e.g., Israel and Sweden) they have learned how to accommodate such developments in the implementation of IT.

What are the fundamental principles guiding the implementation of IT across the globe? What are the emerging challenges and concerns? How best can the benefits of IT be maximized and the costs minimized? This paper focuses on providing answers to these questions. Its overall objective is, therefore, to address the main prerequisites and key challenges of implementing inflation targeting across many countries and draws relevant lessons for countries that are contemplating the adoption of IT. To achieve this objective, the rest of the paper has been structured as follows. Following the introduction is part II which examines the theoretical framework for IT while the review of international experiences is contained in part III. Contemporary issues and challenges are considered in part IV while recommendations and conclusion are the focus of part V.

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[3]*However, it has been argued that there is need to insure against deflation, which in most cases is counterproductive. This informs Bernanke et al (1999) suggestion that greater-than-zero inflation targets is always a better policy option.*

II. Theoretical Framework for Inflation Targeting

IT, a framework for policy decisions in which the central bank makes an explicit commitment to conduct policy to meet a publicly announced numerical inflation targets within a particular time frame, has become a major monetary policy management tool over the past two decades. As espoused above, IT - a neoliberal approach to central banking does not only attempt to keep inflation at a very low level, but also tries to reduce central banks support to government fiscal deficits; help to manage country's integration into the world trade and financial systems; and to systematically reduce the influence of discretion on central banks policy making process (Epstein, 2005; Odusola and Onwioduokit, 2005; and Odusola, 2006). It also serves as a coordinating framework for economic activities of the private sector.

Monetary policy, in general, deals with the relationship between rates of interest and the total money supply (currency and credit) in the economy with the primary aim of influencing one or more of the following: economic growth, inflation, exchange rates and unemployment (Wikipedia,2006). It is about the ability of monetary authority to alter the money supply or rates of interest to influence macroeconomic variables towards the most desirable outcomes. Depending on the policy goal, a monetary policy could be contractionary if it reduces the size of money supply or raises the interest rate, or expansionary if it raises the money supply or reduces interest rates.

A monetary policy is accommodative if monetary authorities alter the interest rates to promote economic growth; neutral if it is neither to spur economic growth nor inflation; and tight if it intends to reduce inflation. Monetary policy can be conducted through administrative fiat or market operations; however, the latter has become the norm in a market based economy. Essentially, the primary means of conducting monetary policies include (i) open market operations (managing the quantity of money in circulation through buying and selling of various credit instruments, foreign currencies or commodities); (ii) discount window lending (lending of last resort); fractional deposit lending (i.e., changes the reserve requirement ratios); (iii) moral suasion (i.e., cajoling certain market players to achieve specified outcomes); "open mouth operation"(i.e., talking monetary policy with the market).

The main focus of strict inflation targeting is stabilization. This is premised on the assumption that once stabilization is achieved, the achievement of other macroeconomic goals follows. Hence, achievement of economic growth, employment generation and poverty reduction now serves as implicit assumptions of strict inflation targeting. The linkage between inflation targeting and the ultimate

macroeconomic goals is through trickle down effects from economic stabilization to growth, employment and income distribution.

The starting point of analyzing the linkage between inflation targeting and monetary policy is to have a clear understanding of the dynamics of monetary policy -monetary policy transmission mechanisms. Inflation is a long-term monetary phenomenon; a clear indication that prices and money are closely related over a prolonged period. The theoretical underpinning of the linkage between monetary aggregates and price level derived its theoretical basis from the crude quantity theory of money. The theory assumes that price level will change proportionately with changes in quantity of money. This belief is often summed up in the phrase, 'money is long run-neutral". The rate of money creation is reflected in the rate of inflation in the long run. It further posits the existence of the classical dichotomy between relative and absolute prices determination. The crude quantity theorists, focusing on long-run relationship, posit that the theory of value explains the relative prices (because they are determined in the real sector) while monetary theory explains absolute prices. A change in quantity of money will only change the general level of absolute prices; it will not affect outputs, or relative prices (Lucket, 1980 and Struthers and Speight, 1986). The theoretical inspiration for inflation targeting derives from the equation of exchange as proposed by the crude quantity theory.

While this classical framework argues that changes in income are determined in the real markets[4], it however, unequivocally provides the basis for monetary authority's control over absolute price movements. Money and prices tend to move together in the same direction and that the primary changes in the price level are brought about by changes in the quantity of money in the economy. This framework holds the view that the quantity of money can be used to control long run inflation dynamics. Since inflation is very vital in economic agents' decision-making, they often monitor inflation through monetary authorities' policy changes. The ability to capture this depends on how well-defined the transitory dynamics are as well as the ability to separate the long run relationship from the noise introduced by the transitory learning dynamics (Bullard, 1994).

Under inflation targeting, the main monetary policy instrument is the interest rate and not money *per se* which does not invalidate the relationship between money and prices as argued above. To ensure that it reflects market dynamics, inter-bank offer

[4]*The tendency for economic activity to grow could derive from development of institutions, the quantity and quality of factors of production as well as public policies.*

rate (overnight lending rate) is often used. It becomes an instrument of ensuring consistency of the growth of broad money supply with the target growth of real GDP and inflation rate. The fundamental variables to watch are excessive demand pressures either because of high fiscal deficit or because of excessive foreign inflows. When either of these holds, money supply grows faster than growth in productive sectors and generates demand pressures that manifest in rise in inflation rate (Akhtar, 2007). Changes in prices are a function of the target and market agents' expectations about future interest rates. Interest rate does not immediately translate to lower or higher prices; rather it affects economic activities (through changes in capacity utilization and employment). Due to lag structure in the transmission mechanism[5], prices adjust gradually rather than suddenly to changes in monetary policy changes. After a while, the developments in the real economic activities affect inflation. Over a long period of time, monetary policy effects on inflation depend on the propagation mechanisms. This propagation or pass-through effect can be bounded or shortened if monetary policy is implemented appropriately and inflation targeting is adjudged to be credible by the public.

The monetary propagation mechanism or pass-through effect from monetary policy to inflation is as illustrated in Figure 1 below. Monetary policy affects inflation in developing countries in many ways. The actions and reactions of interest rate changes, for instance, work through the financial markets, aggregate demand functions, cost correction process and, finally, through absolute price movements. The typical ways through which monetary policy affects inflation in developing countries include, but not limited to:

Influence on financial market assets prices;
How changes in asset prices affect decisions on spending, production and employment;
The implications of the foregoing on costs and margins by market agents;
The inflation expectations generated by developments arising from changes in monetary policy; and
How all the factors mentioned above ultimately affect general price level movements?

Where rational expectation holds among market agents, policy makers are sometimes misconstrued about monetary policy stance when such targets are not announced. For instance when low inflation is anticipated and the marginal benefits

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[5]*The reason for delayed market response to changes in interest rates could arise from many reasons such as cost inherent in price corrections, nominal rigidity in prices and wages, and information asymmetry inherent in the market (Banco Central de Chile, 2007:20).*

of increasing economic growth outweighs inflation cost, monetary authorities have incentives to pursue an expansionary monetary policy with a view to lowering interest rates. These incentives are often misinterpreted by market agents thereby anticipating high inflation. Hence, unless monetary authorities make their announcement on low inflation more credible, such efforts will be misconstrued by market agents and could be a major source of inflation pressure.

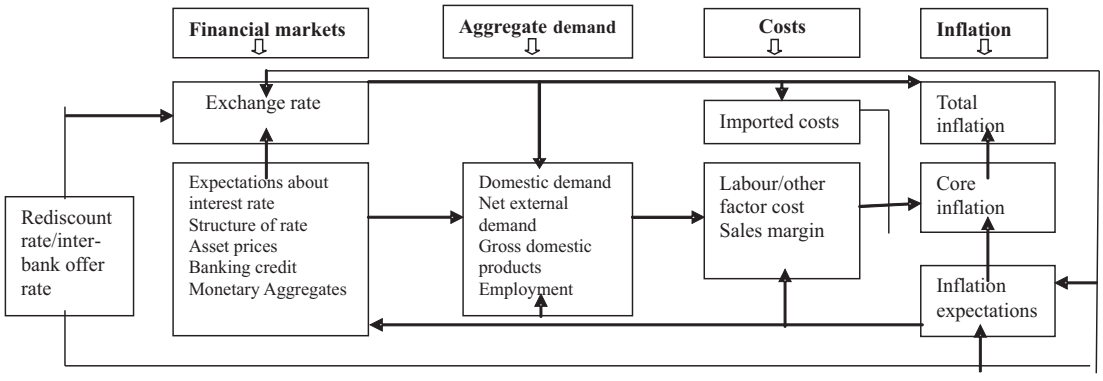
III. Inflation Targeting As a Tool of Monetary Policy: International Experiences

The goal of inflation targeting is to make the process and outcomes of monetary policy more transparent and the monetary authorities more accountable to the public. The transparency and accountability of central banks become imperative since any failure to keep inflation within check as prescribed by the targets makes it necessary for central banks to provide copious explanations for not meeting the targets. IT has become a major yardstick of measuring the performance of central banks in many countries. This section intends to find out how countries effectively operationalise the implementation of IT to achieve the goals it was set for? It also examines the guiding principles for implementing IT. Table 2 provides the emerging consensus on the operations of IT in advanced, transition and developing countries.

What distinguishes inflation targeting from other types of monetary policy regimes?

Obviously, the main distinction lies in the set of instruments and target variables that are used by the monetary authorities to achieve their goals. Table 1 provides a good illustration of the dividing line among the various types of monetary regimes.

Figure 1: Monetary Policy Transmission Mechanisms under Inflation Targeting



Inflation target, for instance, relies heavily on periodic adjustment to the central banks policy interest rate and or inter-bank offer rate. Although both inflation targeting and price level targeting use the same set of instrument, the objectives, however, differ.

Table 1: Monetary Policy Regimes, Targets and Objectives

Monetary Policy Regime	Target Market Variable	Long Term Objectives
Inflation Targeting	Interest rate on overnight debt	A given rate of change
Price level targeting	Interest rate on overnight debt	A specific CPI number
Monetary aggregate	The growth in money supply	A given rate of change in the CPI
Fixed exchange rate	The spot price of the currency	The spot price of the currency
Gold standard	The spot price of gold	Low inflation as measured by the gold
Mixed policy	Usually interest rates	Usually unemployment and CPI change

Source: Adapted from Wikipedia (2007): htt://en.wikipedia.org/wiki/Monetary_policy.

How is inflation targeting managed?

The starting point is a clear definition of how inflation is measured. The most common approach is the CPI definition[6] (i.e., annual 12-month change for Chile and quarterly for Sweden in recent times). Within this framework, a desired rate of price change that is congenial to the achievement of economic growth objective of government is targeted. There is no consensus on the choice of inflation rate to adopt. While some countries prefer 'core' inflation (e.g., Thailand) others such as Chile and Sweden use 'headline' inflation. The argument for the choice of headline inflation, for instance, is its representativeness, credibility, reliability and public familiarity with the index while core inflation is premised on predictability and

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[6]*In measuring inflation, as argued by Boskin et al, 1996 and Agenor, 2000, existing price indices suffer from three main sources of bias: substitution bias (e.g., switching from one expensive to cheap commodities), quality bias (i.e., changes in quality of product that are not reflected in the computation of their prices, and new product bias (this is about inability of the price computation process to take account of new products entering the market while old ones continually exit the market).*

absence of volatility or seasonality element, e.g. perishable goods and energy prices. Core inflation is more closely tied to inflationary trend and it is an important factor in probable inflation. Countries that are susceptible to external shocks and supply side shocks often prefer to target core than headline inflation.

The *choice of Inflation target varies from country to country*; while some have adopted static or point targets others favoured flexible approach of targeting inflation within a bound (see Table 2). The choice of a particular inflation target or target bound is premised on two fundamental factors. The first is the rate of inflation that maximizes the growth potentials and the second is the rate that is congenial to the welfare of the population. The two factors are never mutually exclusive; the rate should not be too high or too low to damage economic growth and reduce employment generation. It is never a universal rate, it is determined by the circumstances of each economy. Finland and UK are known for static targeting while countries like Canada, Sweden, Brazil, Chile and South Africa use bounded targets.

Besides, a *time horizon is always chosen for the duration of the inflation level* or the target. The targeted inflation is achieved through periodic adjustments to the desired interest rate target. During this period, it is important for central banks to communicate to the public that some temporary deviations from the targeted rate will be allowed. Other countries with targeting horizon include Israel, New Zealand, Spain, Brazil and Thailand.

Initial inflation condition matters in the introduction of IT. The framework is better introduced when low and stable inflation has been attained. Introduction of IT at this stage makes maintenance of price stability easier. This is the case in many countries that have implemented IT such as Sweden, Australia and Thailand. Countries with historically high inflation often start with high level of targets. Examples of this include Chile, Brazil, Poland and Czech Republic.

Based on best practices, the most common short-term interest rate is the interbank rate at which banks lend to each other overnight for cash flow purposes. Through the use of open market operations, the interest rate is kept constant for an allowable fixed period and reviewed on monthly or quarterly basis by a policy committee. Changes in interest rate are made in congruence with the market

fundamentals[7]. This underscores a clear understanding of the fundamental determinants of interest rates in each of the economy. In any case, the barometric role of the minimum rediscounting rates of the central banks remains undoubted. Where the discounting rate has lost its influential role, inflation targeting becomes pretty difficult to manage. In Pakistan for instance, it is mandatory for banks to adjust their interest rates within *three days* when the State Bank of Pakistan (SBP) has adjusted the discount rate.

In practice, the *independence of central banks* is required for successful implementation of inflation targeting. The power to formulate, conduct and implement monetary policies is non-negotiable for result-oriented inflation targeting, either strict or flexible. The power to impose limit on government borrowing from central banks is often enshrined within the Central Bank Act. It has autonomy over management of its budget and policy decisions. This is an important area of ensuring central banks independence. These powers are enshrined into the laws guiding the operations of central banks. For instance, in Sweden, it is explicitly stated in the Swedish Riksbank that Executive Board members are expressly forbidden to seek or receive instructions when carrying out monetary policy task (Ingves, 2007b).

One major prerequisite is *absence of fiscal dominance*. Monetary policy independence of fiscal financing needs is vital for success. In practical sense, a way of addressing this issue is the need to *ensure proper coordination of monetary and fiscal policies*. A pillar for monetary policy effectiveness is a responsible and predictable fiscal policy which ensures public sector solvency and eliminates the possibility of subordinating monetary policy to fiscal policy. As such, the establishment of Fiscal and Monetary Policies Coordination Committee is inevitable. This inter-agency committee has been a major source of success in implementing inflation targeting. Sweden, Chile and Pakistan are good examples of countries having strong coordination of monetary and fiscal policies. In these countries, coordination is done to maximize the effectiveness of both policies and respect for each body's independence.

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[7] *This is essentially about responding to demand and supply pressures of the economy in line with trends in monetary assets and liabilities. While the latter (monetary assets) capture the growth in domestic credits and the former focuses on the growth in currency and deposit base. Money supply growth has to be consistent with growth in real GDP and inflation rate.*

As a corollary to the foregoing, domestic debt management is inextricably linked with monetary policy management. Countries with large domestic debts may have some challenges in adopting inflation targeting as a tool for managing monetary policy. Steering interest rates during period of high domestic debts coupled with fragmented financial system makes the framework very tasking to manage; monetary policy is driven by public debt burden.

Another prerequisite is the *absence of financial dominance*. Clearly, for inflation targeting to be effective, monetary policy must be independent of insolvent banks' rescue needs. Central banks absolve themselves from providing rescue packages to crisis ridden banks. This underscores the need to ensure that the *regulatory and supervisory framework governing the financial system is based on prudential regulations and standards*. When this is in place, monetary conditions and foreign exchange policies can be adjusted without exposing the financial system to unnecessary risks that can destabilize overall macroeconomic management.

When inflation targeting is fully institutionalized, there should be *absence of other nominal anchors*. Nominal anchors such as exchange rate and money supply cannot be made explicit and have to be complementary to inflation targeting. Absence of nominal anchor is needed to make the monetary authorities more focused as well as to avoid confusing the public on the overriding goal of the monetary policy.

In a globalizing economic setting, free inflows and outflows of capital improves access to international savings and diversify risks, however, they expose the country to external shocks that could destabilize the entire economy if not well managed. *Adoption of a flexible exchange rate*[8] *management* has been recognized as an effective strategy of limiting the consequences of such external shocks and correcting relative prices. Another fundamental prerequisite for success is the *ability of central banks to forecast economic trend with marginal errors*. It must have a good understanding of the key market indicators that substantially explain the dynamics of economic trajectory of the country. In addition to this, the central banks must have a good understanding of the money markets and the dynamics of the fiscal environment. Simply put, the central banks ability to forecast money demand and fiscal pressure to levy the inflation tax by adjusting the monetary base rapidly should

[8]*The adoption of flexible exchange rate policy makes it easier for countries to bounce back from real shocks as well as prevent severe exchange rate misalignments, avoids costly corrections in terms of the output variable, and weakens movement in speculative capital (Banco Central de Chile, 2007).*

Table 2: Inflation Targeting in Action in Selected Countries – Advanced, Transition and Developing Economies

Country	Inflation Measures (IM)	Items excluded from IM	Inflation Target (%)	Calculation period	Contingencies for breach of targets	Targeting horizon	Adoption date	Separate inflation report	Who sets targets	Publishes inflation targets
Australia	CPI	Mortgage interest, government controlled prices & energy prices	2-3	Cycle	None	None	01/01/93	No*	Govt	No
Canada	CPI†	Indirect taxes, food & energy prices	2-4 (1992) 1.5-3.5 (June 94) 1-3 Dec 93-Feb 01‡	Annual	None	No	02/26/91	Yes	Joint	No
Finland	CPI	Housing capital cost, indirect taxes & government subsidies	2 annual average from 1995	Annual	None	No	02/02/93	N0§	Central bank	No
Israel	CPI	None	14-15 (1991-92) 8-11 (1995), <4 (1999), 3-4 (00-01)	Annual	Short term influences embedded in certain components of price index, e.g., process of fruits, vegetables, housing and imports.	Yes	01/01/93	Yes	Central bank	Yes
New Zealand	CPI**	Commodity process, govt controlled prices, interest & credit charges	3-5 (Dec 1990) 2.5-4.5(Dec 1991) 1.5-3.5 (1992) 0-2 (1993-96) 0-3 (Since 96)††	Annual	'Unusual' events that do not generate general inflationary pressure.	Yes	03/02/90	Yes	Joint	Yes

The Governor is, however, available to report on the conduct of monetary policy twice a year to the House of Representative's Committee on Financial Institutions and Public Administration.

Although the target is officially specified in terms of overall CPI, the Bank of Canada focuses on the CPI excluding food, energy and the effects of indirect taxes.

Renewed in February 1998.

Finland reports on quarterly inflation outlook in the monthly bulletin.

Since December 1997, the CPI excluding credit services is targeted. Before the date overall CPI was targeted, in the later 1999 mortgage services were removed from the target.

The terms of the new Policy Target Agreement (PTA) coincides with the term of the Governor which expired August 2003.

Table 2 Cont'd: Inflation Targeting in Action in Selected Countries - Advanced, Transition and Developing Economies

Spain	CPI	Mortgage interest costs	3.5-4 (June 96) 3-3.25 (1997-Q1) 3 upper limit for 1997, 2.5-2.75 upper limit for late 97 &2 for 1998	Annual	None	Yes	01/01/95	Yes	Central Bank	No
Sweden	CPI	Nominally none but conditional on indirect taxes, subsidies	1-3 since 1995	Annual	None	No	01/15/93	Yes	Central Bank	Yes
United Kingdom	CPI	Mortgage interest payments	1-4 until June 1997 2.5 since June 1997	Annual	None	No	10/08/92	Yes	Government	Yes
Brazil	CPI	None	2-8 (1999) 2-6 (2000) 2-4 (2001) 2-3.5 (2002)	Annual	None	Yes	06/21/99	Yes	Joint	Yes
Chile	CPI	None	18 (1991) 3.5 (2000) 1-3 (2001 onwards)	Annual	None	No	09/01/90	Yes	Central Bank	Yes
South Africa	CPI	Mortgage interest costs	3-6 (2002)	Annual	Major unforeseen events outside central bank control	Yes	02/01/00	Yes	Central Bank	Yes
Thailand	CPI	Raw food and energy prices	0-3.5 (2000-01)	Annual	None	Yes	05/01/00	Yes	Central Bank	Yes
Czech Republic	CPI		0.5-8 (1998) 0.5-4.5 (1999) 1-4.5 (2000) 1-3 (2001) 1-2 (2002)	Annual	Substantial deviation in raw materials prices, energy prices and other commodities Major deviations in exchange rate not connected to domestic fundamentals	Yes	12/21/97	Yes	Central Bank	Yes
Poland	CPI		8-8-5 (1999) Below 4 (1999-03)	Annual	Any available information which could jeopardize the target	Yes	09/01/98	Yes	Central Bank	No

Source: Agenor (2000), pp.82-83

be unquestionable. Essentially, central banks' staff must have a very good understanding of the monetary policy transmission mechanism of the economy. This is vital for evaluating the consistency between current monetary policy and future/expected price trends.

From experience, *reduction in inflation expectations takes a long time to achieve* especially when low inflation is not yet a tradition. As such the slow adjustment of expectations has made the task of monetary policy management quite daunting. Researches in determining the speed of adjustment is still very rudimentary in many countries. This explains why countries like Chile, Brazil and Czech Republic started with high inflation target before reaching moderate inflation targets.
The effectiveness of *inflation targeting relies on credible announcements*, i.e., the private agents must believe that inflation announcement will reflect actual future policy. When private agents do not believe such announcements, wage settings will anticipate high-level inflation, hence, wages will be higher and inflation will rise. The key sources of inflation will be the increase in consumers' demand (demand pull inflation) and increasing firms' cost (cost push inflation). The import of this is that if policy makers' announcement of monetary policy is considered by the private agents not to be credible, the policy will not have the desirable effects. This points to the significance of credibility announcement.

Evidence from best practices has shown that credible announcement can be achieved through various means. An important factor that influences private agents' expectations about low inflation is the independence of the central bank. For instance, central banks can be given incentives to meet their targets when they have control of their budgets including the compensation for the top echelon of the banks. The independence of central banks, whether instrument or policy, increases reputation and commitment to low inflation.

Mere independence does not, however, automatically generate announcement credibility. Reputation is built over time and it is an important aspect of monetary policy implementation. Reputation is achieved through good performance in conducting monetary policy in the immediate past. Market agents' confidence is built on the basis of past record of performance on the chosen policy stance, targets and objectives. The import of this inflation targeting cannot be achieved unless there is a reasonable level of favourable perception from the public about central banks' primary mandates as dictated by their past policy actions/records.

It has also been observed that *reputation is not synonymous with commitment*. While reputation plays an important role in the perception of the public about central banks commitment, optimal commitment to inflation targeting is built around central banks' leadership distaste for inflation than the rest of the economy on average (Rogoff, 1985). It is not about statistical gymnastics where the public perceived the actual inflation to be higher than the published figures. Rather, it is about believing in low inflation and continuously ensuring that the target is achieved. Other practical issue emerging from the implementation of IT is the *possibility of changing targets and the implication on credibility*. Practical experience has shown that it is possible for targets to be changed. The change can occur under the following conditions. First, when inflation projections are not consistent with the set targets especially when new information about the economy and some exogenous factors emerge which do not conform to the original assumptions. Second, targets can be changed to conform with the degree of stimulus expected from the monetary policy. This is premised on the fact that future inflation depends on economic agents' expectations about future monetary policy interest rate, the impact of interest changes on term structure of interest rates and asset prices.

It is also obvious that private expectations, for different horizons, could differ systematically from the target inflation rate. When this persists over a longer term, it is often seen as a loss of credibility of the monetary anchor. This could be as a result of central banks inability to meet the original commitment. Alternatively, it could also be a signal for a change in the targets. It is, however, important to note that under inflation targeting, policy surprises should be an exception rather than being the rule.

One practical issue demanding adroit skills is *managing the policy instruments under inflation targeting.* This relies heavily on the ability of the staff of central banks to prepare weekly and monthly cash flows of the financial system and determine all flows that will expand or contract the monetary base. Essentially, it is about managing the portfolio maturity of the financial system with a view to injecting or mopping up liquidity as circumstance demand.

To do this effectively, central banks should have access to a range of instruments to swiftly accommodate liquidity to keep the observed inter bank rates near to the target. These include reserve requirement ratio; open market operations instruments such as repurchase operations, outright purchase or sale of government securities, issuance of bonds, and foreign exchange swaps; and standing facilities (such as collateralized standing overnight credit facilities). All these require monetary policy instruments that are fully market determined short term interest rates.

The foregoing constitutes the principles and requirements for implementing an effective IT in any economy. They need to be thoroughly understood before inflation targeting is embarked upon. Even when their fundamentals are clearly mastered, some issues deserve to be given serious consideration while implementing IT. Some of these are examined below.

IV Contemporary Issues and Challenges in the Implementation of IT

The implementation of IT in many countries, advanced and developing, has led to the emergence of some issues and challenges for monetary authorities to address if monetary policy effectiveness is to be achieved. An emerging issue, which has been at the core of the criticism against IT, is the existence of little evidence on the link between inflation targeting and the ultimate macroeconomic goals. The adoption of inflation targeting in most countries has made employment creation and promoting real economic growth to be relegated to the background from many central banks agenda. There is urgent need to foster the linkage between inflation targeting as a monetary policy framework and the promotion of economic growth, employment creation and poverty reduction. The dire need to look for an alternate monetary policy regime that fosters this linkage has been the main preoccupation of many research institutes such as the Political Economy Research Institute over the past one decade.

Evidence from many countries with success story on the implementation of inflation targeting is adherence to adequate coordination of monetary and fiscal policies. Due to the serious implications of fiscal profligacy, the need to have *rule based fiscal policies* is inevitable. In many countries Fiscal Responsibility and Debt Limitation Act has been established. This requires a strong cooperation between central banks and ministries of finance and to some extent the agency responsible for debt management at the country level.

The design of an effective monetary policy framework underscores the need to identify the main determinants of inflation and understand how monetary policy interacts with them to affect the rate of increase in the consumer price index. The main sources of inflationary pressures are vital for informed monetary policy decisions. Essentially, it is necessary to understand the monetary policy transmission mechanism or the pass-through effects. Although the fundamental assumption under inflation targeting is that non-monetary factors mostly have temporary impact on inflation while only monetary factors have long term impact on inflation, this requires empirical verification. Two alternative frameworks tend to provide some illuminating explanations to this hypothesis. One school holds the view that

traditional monetary explanation and exogenous shocks to money supply cause inflation. The second school of thought is based on the assumption that price rigidities, shocks to key prices in the economy (e.g., wages, exchange rate and process of public sector outputs such as fuel prices in Nigeria) affect inflation directly while monetary policy merely accommodates these shocks. Based on this framework, the effectiveness of policy accommodation is central to managing the long-run inflationary impact of the shocks from economy-wide prices. The main challenge is the knowledge of monetary policy operators in understanding these dynamics and the linkage between inflation on one hand and monetary and non-monetary factors on the other hand.

Inflation targeting in an open economy creates its own challenges - exchange rate becomes an essential component of the monetary policy transmission mechanisms. Exchange rate affects the target variables of the monetary authorities: inflation and output gaps through variety of channels (e.g., through prices of imported goods, aggregate demand and supply (via cost of production)). Inflation targeting is, therefore, consistent with the floating exchange rate regime. Stable inflation is a critical factor for long term stability in exchange rate. Arising from co-movements between nominal exchange rate and inflation, a flexible exchange rate system further reinforces stable prices because it has the potential of avoiding speculative attacks to the domestic currency and to prevent exchange rate misalignment. The capacity to manage the adjustment of real exchange rate towards its long run equilibrium in the face of external shocks is also required. This is particularly so because exchange rate stability is a major source of central banks credibility from the public perspective. This realization, for instance, has informed the need to complement inflation targeting with floating exchange rate in Chile. This is further reinforced by the conclusions from Agenor (2000:41) thus:

With the exception of Israel and Spain, all countries implementing inflation targeting did so in the context of highly flexible exchange rate regime.

The inability of these two countries to implement flexible exchange rate has been a major constraint to achieving inflation objective. In Israel, for instance, the level of interest rate to achieve the inflation target was inconsistent with the level required to maintain the nominal exchange rate with the prescribed diagonal exchange rate band. Adoption of IT, in principle, precludes the monetary authority to any commitment to a particular value of exchange rate.

For inflation targeting to be in congruence with floating exchange rate management, the 'thermostatic' role of short term interest rate must not be in doubt. For instance,

where an exogenous shock causes a sharp nominal depreciation of the domestic currency, management of monetary policy becomes relatively complicated especially in countries with a history of high inflation. When the shock is perceived to be permanent, it will translate into increases in the prices of tradables which further put pressures on general price levels. This could trigger another round of price movement if the public adjust their inflation expectations upward (e.g., on wages and non-tradable goods). Central banks also need to balance the demand for and supply of base money at rate of interest above the current market rates. However, this is not the case in many developing countries.

Besides, the liquidity of foreign exchange market is vital for managing exchange rate in a way that is consistent with inflation targeting framework. To ensure exchange rate stability, central banks need appropriate instruments to monitor and manage the liquidity of the foreign exchange market. This could, however, be difficult to achieve under a deregulated capital accounts management and the level of integration into the global economic system. Central banks need substantial reserves to defend the currency when it is temporarily under some form of attacks.

One major critique against this framework is the little attention given to 'real' factors such as employment, investment, real growth, poverty reduction and income distribution in countries where inflation targeting has been adopted as a tool of monetary policy management. As argued by Esptein (2005) (but countered by (JEC, 2005) among others), 'inflation targeting has generated significant costs-slow growth, sluggish employment generation and high real interest rates -while yielding, at most, minor benefits'. Some others have also mentioned the side effects of inflation targeting such as asset price bubbles, new incentives to take risks and possibility of financial instability. The conclusions from the Governor of Swedish RIKSBANK (i.e., the Central Bank of Sweden) one of the most successful implementers of inflation targeting across the globe provide the key challenges from this debate (Ingves, 2007:6):

Inflation targeting so far has proved to be a successful way of conducting monetary policy, but there are unresolved issues and one concerns the treatment of house and other asset prices; it has been hard to formally fit asset price development into the frameworks researchers and central banks use when they study inflation targeting.

Where economies are characterized by uncertainties, *an inflexible and undue reliance on inflation forecasts with minimal attention to the supply-side factors can*

create policy problems. IT should, therefore, give room for flexibility with attention given to the volatile supply-side components (which are often assumed off as a short run phenomenon). In the presence of supply shocks, flexible inflation targeting could bring about trade-off between inflation variability and output gap variability. An optimal combination of the goals becomes imperative for the monetary authorities optimal policy frontier. The higher the relative weight attached to output fluctuations in central banks policy loss function, the longer it will take inflation to converge to its target value when shocks occur. Experience has further shown that too much of target flexibility weakens the credibility of central banks.

The key challenges, as examined above, include understanding the key determinants of inflation, knowing in detail the transmission mechanisms of monetary policy, and the adoption of a rule based fiscal system. In addition to these, since most countries operate open economies, the centrality of adopting flexible exchange rate policy is vital for the objective of IT to be achieved. The challenge of devising mechanisms for handling the ripple effects emerging from asset price development, especially mortgage institutions, also remains daunting. Finally, the challenge of adopting a flexible IT that takes into consideration optimal combination of goals also deserves some consideration.

V Recommendations and Conclusion

Recommendations: Are there lessons that Nigeria can learn from countries that have implemented IT? Yes, lessons abound. The present banking consolidation has created an era of possibility in the country's monetary authorities. This has created some level of credibility for central bank's operations in the country. The Central Bank of Nigeria's Act has created the required independence by *de jury*; this should be complemented by *de facto* independence.

A necessary condition for success in implementing IT is the need for stronger collaboration among the fiscal and monetary authorities in fashioning harmonious and result-oriented macroeconomic policies and strategies. The establishment of the Economic Management Team in Nigeria, since 2003, could be likened to this. However, its composition is currently biased against monetary agencies. There is need to have a smaller group with adequate representation from the monetary and fiscal agencies. The committee will be responsible, among others, for alignment of monetary and fiscal coordination especially the Medium Term Fiscal Strategy and Medium Term Financial Sector Strategy.

The environment for implementing inflation targeting cannot be conducive unless fiscal responsibility acts are legislated across the three tiers of government and strictly monitored. This is crucially important because lower tiers of government account for relatively more than 50 percent of public resources in the country. Evidence from countries that have adopted inflation targeting reveals the need to invest constantly and appreciably in improving macroeconomic models with a view to strengthening analytical framework that support monetary policy pass through mechanisms and also to support decision making processes. Although efforts have been initiated in this respect by the management of the CBN, such initiatives should be scaled up and made more focused. Human and institutional capacity should be built to understand and analyze the key determinants of inflation, the dynamics of monetary policy transmission mechanisms, operations and management of flexible exchange rate policy as well as managing the ripple effects of asset price bubbles. Adroit skills in macroeconomic modeling and forecasting are vital for success.

The need to pay attention to asset prices and real factors is well appreciated. While the need to ensure that inflation targeting captures the dynamics of asset prices in the financial markets especially those determined by economic fundamentals is imperative for success, it is also important to note that inflation targeting is not an end but a means to achieving socio-economic and human development. While the consideration for real factors such as investment, employment, real economic growth and poverty is necessary for substantial progress, attempt to re-introduce erstwhile regulatory and repressive financial system under the guise of capturing real factors will be counterproductive and should be avoided.

Nigeria is challenged on which inflation target to adopt. The country faces external and supply side shocks which tend to suggest the choice of core inflation. However, to the Nigerian public, headline inflation matters. Core inflation is merely seen as a technical issue which does not have serious impact on welfare. Hence, the choice of core inflation poses some credibility problem for central banks. With IT, the CBN leadership must believe in having low inflation and must show commitment to it. The CBN should invest heavily in generation of high frequency data that support regular communication to the public. The current level of transparency and accountability is appreciated; however, there is more room for improvement. Credibility can only be built on transparent and accountable process.

Conclusion

Conducting monetary policy, especially IT, is in many ways a learning process. Implementers have a good mastery of the process when challenges emerge and are surmounted. This is particularly important given the globalised, constantly changing environment most central banks operate and which always makes new demand on the operation of monetary policy. This underscores the need to constantly refine and improve the monetary policy strategies and frameworks. For central banks to successfully build credibility and to demonstrate their commitments to IT regime, it is imperative to set IT suitable to current economic realities and conditions. For developing economies, like Nigeria, a flexible IT is advised- price stability should be a long term goal of monetary policy while the central bank, to some extent, is equally concerned with the stability of interest rates, exchange rate, real economic growth and employment. This, to a large extent, links monetary policy to broad macroeconomic policy goals.

The fact that developing countries have higher inflation than advanced countries, predicting inflation is challenging and the case of missing inflation targets is a common place. The autonomy of most central banks in developing countries is more of a statutory and not a *defacto* factor. Independence of central banks is not only in the choice of inflation target but also in the choice and manipulation of policy instruments. Another requirement for IT is the absence of a *defacto* targeting of the nominal exchange rate. It will be difficult to operationalize IT without a strong commitment to improved communication strategy, transparency and accountability. All these make IT daunting and challenging in developing countries.

The foregoing issues, among others, determine the readiness of countries for adopting IT. Other important factors that determine the readiness for the adoption of IT are the size of domestic debt which complicates the interest rate steering role of the monetary authorities; absence of fully integrated financial markets as financial market segmentation obfuscate monetary policy transmission mechanisms; and the ability to develop a representative measure and determinants (including monetary and supply-side measures) of inflation for the purpose of inflation targeting. IT requires central banks to have technical and institutional capacity to model and forecast inflation, understand the monetary transmission mechanisms, and have unquestionable knowledge of the lags between the adjustment of monetary policy instruments and their effects on outputs and prices.

The centrality of the barometric role of official interest rates in the economy cannot be underestimated. Market interest rates respond relatively quickly and significantly to changes in official interest rate. This still remains a daunting challenge in Nigeria due to a weak linkage between the policy rate and inter-bank offer rate in the country.

IT as a tool of monetary policy is not a panacea to the problem of inflationary pressures. A strong coordination of monetary and fiscal policies is vital for success while the government will also need to alleviate the supply side constraint arising from market structure and distribution system. Low and stable prices are not ends in themselves; hence, central banks should focus on inflation targeting that is amenable to promoting real economic growth and employment generation.

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Asset Price Movements and Derivatives: Implications for Monetary Policy in Nigeria

*Ola Sholarin Ph. D**

I. Introduction

Accurate asset pricing is one of the fundamental and most pressing problems confronting modern finance practitioners. The risk of overvaluing ones assets needs to be carefully balanced against the threat of undervaluing them. This is because either situation could trigger arbitrageurs' and/or speculators' intervention to restore equilibrium at the expense of assets owners. In markets where information efficiency holds, erratic price movements should be at their minimum level.

On the premise that Nigeria's financial market is virtually accelerating towards global integration, this paper argues from the perspective of a wide group of stakeholders and highlights the importance of maintaining accurate market value for a wide variety of asset classes. From the perspective of speculators, the author discusses the methodology for identifying undervalued or overvalued assets for the purpose of taking appropriate bet on such assets. From analysts, hedgers or investors perspective, this paper discusses how financial instruments derivative could be used to protect financial assets and return on such assets against volatility. The author highlights application of the same set of derivative instruments for speculative, regulatory arbitrageurs and other purposes. For the same group, this paper identifies fundamental variables that determine assets' prices in a free market economy. The author specifically identifies interest rates, exchange rates, rates of inflation as well as monetary and macroeconomic policies as the main asset-price determinants.

This paper offers a set of mathematical models for pricing different categories of financial assets. The author maintains that financial engineering has ushered in a new set of financial assets, such as catastrophe bonds and collaterized debt obligations

**Ola Sholarin works as senior analyst in structured finance with Bergstrom Capital in London where he specialises in Asset-Backed Securitisation and fixed-income derivatives. He also works as a Senior Lecturer in quantitative and financial economics at the University of Westminster in London. Prior to these, Ola has also worked as equity research analyst with Midland Investments Corporation in London. His contact detail is sholaro@westminster.ac.uk. The views expressed are entirely those of the author.*

(CDOs), which are inherently difficult to price. At every opportunity, the author elucidates the roles of monetary policy makers in fostering efficient financial market system in an emerging economy like Nigeria.

According to Fabozzi (2006) and Martellini et al. (2004), asset pricing is a process by which the market value of a financial asset is determined. While the process relies heavily on accounting figures, it essentially incorporates the value of other intangible elements of the reference asset.

To the extent that the figure incorporates anticipated value of the reference asset, the price of any financial asset is essentially the outcome of the present value of its future receivables discounted at a reference rate or yield plus present value of the asset's par value, Hull (2005). The market worth of financial assets is constantly changing as they adjust to fundamental variables that apply to them. In a free market economy like Nigeria, market-sensitive information plays important role in determining the market worth of an asset. Ryan (2007) finds that the purpose of conducting pricing exercise on a reference asset includes, but not limited to, identifying the market worth of such asset at a point in time with the intention of taking speculative, hedging or arbitraging position as the condition may warrant, and depending on the identity of the reference entity. Agrawal et al (1992) holds that determining the price of a financial asset is a continuous process. Usually, it ends with the liquidation of the asset or, in case of a debt instrument, it coincides with its maturity date.

The issue of asset pricing is used by different entities and for different purposes. Regardless of the purpose, however, accurate asset pricing is one of the fundamental responsibilities of financial practitioners. By virtue of their roles, financial institutions in Nigeria and the Central Bank in particular, impliedly assume responsibility for providing essential inputs - including discounting interest rates, inflation targets and anticipated exchange rate - with which to calibrate market value for various categories of financial assets. Those who rely on, and use asset pricing in their daily activities include: analysts, investors, rating agencies, market makers, speculators, arbitrageurs and a host of other stakeholders. These market participants and intermediaries need to evaluate the price of their reference assets in order to make appropriate decisions in their financial activities.

Motivation and Context

Asset valuation, derivatives and exchange rates have received reasonable level of attention amongst front line researchers of modern times. The author divides these

researchers' areas of attention into different strands and discusses their contributions separately. Prominent works in the field of assets valuation are those of Barker (2001), Damodaran (2001) and Schwartz (2001). These authors offer a comprehensive analysis of valuation models using accounting figures for dot.com companies as their case studies. Examples from a number of old tech and new tech companies are included in their sample. Another author Hand et al (2003) - looks at a systematic approach to evaluation of intangible assets and the risks involved.

Agrawal et al (1992), Franks et al (1996), and Gorton et al. (2005) consider valuation for hostile takeovers and other forms of mergers and acquisitions. These authors share the view that post-merger value-added contribution for acquiring firms is as important as acquisition premiums for target companies when it comes to asset valuation for the purpose of mergers and acquisition. Jensen (1998) and Ryan (2007) hold the same view as Agrawal (1992), Franks et al (1996) and Gorton et al. (2005) on the issue of mergers and acquisition. Jensen (1998) and Ryan (2007) went further to explore causes of Mergers and Acquisition and their consequences for acquiring firms.

Another work, by Hull (2005), investigates foreign exchange and their effects on stock bonds. Other works in similar strand are that of Martellini et al (2004) and Fabozzi (2006). These two outstanding researchers and authors extensively explore fixed-income securities and their mathematics. Martellini et al (2004) and Fabozzi (2006) mathematically contend that the price of a reference financial asset is equivalent to the summation of the present values of all future receivables for the reference asset and present worth of such assets' par value. Fabozzi, in particular, applies an annuity formula to further illuminate the mathematics of assets pricing. His attention was mainly directed at evaluating fixed-income financial products. Another author in this category Hull (2005) critically explores the concept of options, futures and other derivatives and their applications to risk analysis and speculation on various financial asset groups. Hull's areas of attention include interest rate derivatives, credit derivatives and derivatives of exotic financial products including weather and energy products.

A large subset of academic investigations examines the issue of exchange rate, interest rates and other macroeconomic fundamentals that determine assets' prices. In this category Lucas (1982), explores the effects of interest rates and foreign exchange on financial assets' pricing. Lucas contends that positive correlation exists between interest rates and exchange rates. He also opines that the two indicators can be highly effective tools in monetary policy analysis. Another author, Jorion et al (1990),

considers the concept of purchasing power parity and its influence in optimal exchange rates determination.

In all, this paper seeks not to contradict, but rather to complement existing academic materials regarding the importance and applications of derivatives and exchange rate volatility in asset price determination. In addition, the paper attempts to highlight the roles of monetary policy practitioners in fostering effective asset-pricing mechanism in an emerging economy like Nigeria. In its contribution, this paper maintains that effective and coherent asset-pricing policies will place Nigeria in good stead. The author contends that failure to achieve this is to provoke frenzied attacks on under/over valued assets from speculators and arbitrageurs seeking to restore market equilibrium.

Problems of Asset Pricing

According to Schnitzer (1996) and Schwartz et al (2000) one of the fundamental challenges that confronts quantitative analysts and other specialists involved in asset pricing is the need to forecast the future value of financial assets with reasonable accuracy. Cash-flow modeling that is widely being used is not without its flaws as it relies overwhelmingly on subjective probability figures with which analysts extrapolate assets' expected future values. What compounds this problem is the fact that there are different categories of assets, and each of the categories requires fundamentally different valuation methodology according to Scherer (1988).

Another problem associated with asset pricing, especially with financial assets, is the fact that cash flow of most of these assets are notoriously volatile. This necessitates application of dynamic stochastic modeling techniques that require specialist knowledge including **GARCH** and other advanced quantitative techniques.

While most of the problems identified so far can be categorized as challenging, there are some which are simply daunting. To this category, according to Fabozzi (2006), belongs the difficulty associated with identifying appropriate discount rate with which to evaluate present value of a future stream of receivables. While it is normal to use a reference benchmark such as *Libor, Euribor, federal bonds spread (USA), local discount/open market rate (Nigeria),* there is no guarantee that such benchmark adequately reflects the appropriate market risk that best applies. It can be argued that the limits of the differentials that may result from such discount rate anomaly will tend towards zero and will eventually be corrected by the influence of arbitrageurs as number of such anomalies increases. While this argument holds in deep, broad and

highly efficient financial market regions; such argument can not be supported in less sophisticated markets including Nigeria which are characterized by relatively shallow capital base and less efficient financial system that is saddled with legal and other infrastructural impediments.

In the light of the above, it is imperative that monetary policy authorities in Nigeria devote adequate attention and resources to modeling interest rate and its volatility in a manner that best capture cost of capital. As Nigeria accelerates towards global financial integration, her interest and exchange rates, should adequately reflect regional and global purchasing power parity. This is necessary to stem speculative attacks which any anomaly might provoke.

The global financial markets are fast becoming borderless and highly integrated. This globalization phenomenon is genuinely abated by advancements in information technology and cohesion between advanced modeling technique and financial engineering. As a result of these factors, a new wave of financial instruments, which are sophisticated and complex to evaluate is now emerging according to Martellini et al (2004) and Hull (2005).

This new category of assets includes weather derivatives and associated catastrophe bonds. Other financial instruments that are considered very advanced and, hence, difficult to price include CDO of CDOs as well as other exotic over the counter (OTC) instruments. One other factor that poses problem when it comes to financial assets' pricing is the fact that the prices of most financial assets are closely related to and stubbornly mirror rating values attached to such assets.

To the extent that such rating values are not static and merely express probability of default, one can comfortably query the veracity of such rating-induced pricing technique. Monetary policy makers need to ensure transparency and consistency in rating mechanism available to stakeholders in Nigeria and that all stakeholders are knowledgeable about such mechanism. The stride being made towards global financial integration suggests that Agusto rating services alone might not be able to cope with speed and magnitude of prospective transactions that will soon follow. It is equally imperative that users of rating figures are monitored in a manner that precludes misconception of expression of probability to honor a debt obligation with willingness to actually honor it. The recent sub-prime mortgage crisis in the United States of America and the global contagion effects that followed lend credibility to this view (Financial Times 19th, 22nd, and 23rd October, 2007).

When Price Does Not Reflect Value

Investors, analysts and other market makers are constantly reviewing assets prices as they seek to identify undervalued or overvalued assets to take position on or against. To achieve this goal, these professionals employ a number of techniques prominent amongst which are the following:

By comparing the accounting value against the market value of reference assets

By comparing actual value of assets against their expected value

By separating the effects of macroeconomic indicators such as interest rate, exchange rate, inflation and taxation.

Another potent tool being used to identify overvalued or undervalued assets is by analyzing effects of global-specific shocks such as the Asian flu, Russian crisis and, more recently, the American sub-prime mortgage crisis. The degree of exposure of individual assets or countries to a global contagion is dependent on coefficient of correlation that exists between financial indicators of regions or assets under investigation.

Benchmarking and arbitrageurs' barometer are other common empirical methods being used.

According to Baker (2001) and Damodaran (2001), while arbitrageurs and speculative opportunities might add depth and breadth to a financial market and, hence, help ensure its efficiency, extreme shocks and erratic volatilities are considered unhealthy by market participants. Monetary policy makers need to ensure timely disclosure of market-sensitive information at corporate and at national levels in a manner that disadvantages no one in the market. This will enable market participants to adjust their asset valuation techniques accordingly and to avoid erratic volatility or shocks. Monetary policy makers, in addition, need to explicitly discourage abuse of "inside knowledge". This will ensure level playing fields and heighten investors' confidence.

Motivations for Asset Valuation

Assets valuation is performed for a variety of reasons and purposes. The following are the prominent reasons behind assets valuation:

Valuation for liquidation: Here the emphasis is on residual value of assets and net income, if any. The value of outstanding debt is equally important in this circumstance.

Valuation of a going concern: Here the accounting value is considered along with the market value of other intangible assets such as goodwill and ranking amongst competitors.

Valuation for Initial Public Offer (IPO): The value here depends on accounting value of operating assets and market assessment of future stream of income receivables. Unique position of a new company, such as patent rights or license to a new technology can substantially affect its market value during a road show for an IPO.

Valuation for Mergers and Acquisition: Here the key determinants of value are the accounting value of operating assets of the target company, goodwill and other intangible assets of the company and post-acquisition magnitude of future receivables of acquiring firm. In this case, the size of the control premium and post-acquisition value added need to be attended to by experts (Franks et al. 1996, Gorton et al. 2005, and Schnitzer 1996). Market perception of post-acquisition value of risk to be inherited by acquiring firm equally influences asset pricing for mergers and acquisition. In case of a hostile takeover, valuation process can be stifled and deliberately influenced due to information asymmetry and effects of bounded rationality.

Monetary policy makers in Nigeria need to ensure that information disclosure in company brochures and public domain are adequate, reliable and provided in a manner that is transparent and consistent. Malicious falsification of market-related information should be acutely discouraged.

Valuation of Financial Assets and Securities

According to Sholarin (2005), financial assets and securities are fundamentally different from other forms of physical assets in the sense that they can command far higher prices than their accounting values, depending on their rating, market expectation regarding their future value and magnitude and volatility of their future cash flow.

The following are examples of financial assets or securities for which effective pricing methodologies already exist globally:

Equity
Bonds
- Zero-coupon or bullet bonds
- Coupon-paying bonds

- o Plain vanilla bonds
- o Exotic bonds [putable bonds, callable bonds, convertible bonds, and warrants].

Financial derivative products

- o Futures
- o Swaps
- o Options
- o Swaptions

In addition to these, there are other OTC products for which prices can be computed.

Lucas (1982) argues that the role of inflation, interest rate and exchange rate in determining market values of financial assets can not be overemphasized especially where future receivables are meant to be considered. As such, he further contends that it is the duty of monetary policy makers to ensure that these indicators are regularly available and that their future values are fairly predictable.

Mathematics of Debt-Instrument Pricing

The mathematics required for pricing financial securities are highly developed and have matured over the last two decades. With advancements in computational technology and modeling skills, the frontier continues to shift and, as yet, remains undefined. While fundamental differences may remain in areas of usage and applications, Hull (2005) and Fabozzi (2006) postulate that financial securities are priced on the basis of the present value of their future stream of receivables, as well as the present value of their future par values. As an example, this paper will focus on pricing of coupon-paying bonds, as well as zero-coupon bonds. Other categories of assets mentioned above can be priced with modifications to the mathematical equations offered.

Pricing Coupon Paying Bonds:

For a bond that makes semiannual coupon payments of C/2, and has a semiannual yield of y/2, the market price could be determined by:

$$\rho = \frac{C/2}{1+y/2^{\,d/d'}} + \frac{C/2}{1+y/2^{\,1+d/d'}} + \frac{C/2}{1+y/2^{\,2+d/d'}} + \ldots\ldots + \frac{C/2}{1+y/2^{\,n-1+d/d'}} + \frac{M}{1+y/2^{\,n-1+d/d'}} \quad \ldots\ldots\ldots\ldots (1)$$

Using summation notation, it follows that:

$$\rho = \sum_{t=1}^{n} \frac{C/2}{1+y/2^{\,t-1+d/d'}} + \frac{M}{1+y/2^{\,n-1+d/d'}} \qquad \text{.....(2)}$$

From equation (2) it can be concluded that the price of a coupon paying-bond is a combination of the following two elements:

1. The present value of coupon payments
2. The present value of the par value or maturity value

This will enable us to separate coupon payments, and interest from its re-investments, from the present value of the par value of a bond.

In this case:
The present value of all coupon payments and return on their reinvestments which is:

$$\rho = \frac{C/2}{1+y/2^{\,d/d'}} + \frac{C/2}{1+y/2^{\,1+d/d'}} + \frac{C/2}{1+y/2^{\,2+d/d'}} + \text{.....} + \frac{C/2}{1+y/2^{\,n-1+d/d'}}$$

Will become:

$$C \quad \frac{1-\dfrac{1}{1-i^{\,N}}}{i} \qquad \text{……..(3)}$$

The mathematical expression (3) is the same as the present value of an annuity **(C)** in which first payment commences at time [t+1]**,** which in this case represents coupon, payable over **(N)** years and discounted at the rate of **(i)**

And the present value of the par value will be:

$$\frac{M}{1+y/2^{\,N}}$$

This will enable us to rewrite equation (2) thus:

$$C\ 1-\frac{\frac{1}{(1-i)^{n}}}{i}+\frac{M}{(1+y/2)^{N}} \qquad \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

It is assumed that settlement date for **[C]** does not fall between coupon periods. As such, exponent **[n-1+d/d]** is replaced with **[N].**

Alternatively, Equation (2) can be rewritten as:

$$\rho=\frac{1}{1+y/2}^{d/d'}\left(C/2+\frac{C/2}{y/2}\left(1-\frac{1}{(1+y/2)^{n-1}}\right)+\frac{M}{(1+y/2)^{n-1}}\right) \qquad \ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Pricing Zero-Coupon Bonds

Equations (1, 2, 3 and 5) assume that coupon payments are paid at irregular intervals and settlement date falls between coupon periods. Where no coupons are paid, and maturity period of (N) years are uninterrupted, this will be regarded as zero-coupon bonds. The price of such bonds will simply be:

$$P=M\ \frac{1}{(1+i)^{N}} \qquad \ldots\ldots\ldots\ldots\ldots (6)$$

This is equivalent to the price of principal amount only in a mortgage bond where no foreclosures are assumed, and that interest payments are considered separately. This has further applications in pricing Residential Mortgage-Backed Securities [RMBS] under Asset-Backed Securitization [ABS] transactions. The same equation is applicable in valuing non-interest deposits. The equation can also be used in pricing treasury bills in discount markets.

More advanced [Black-Scholes] model enables analysts to price derivative products including bond options, interest rate swaps and swap options. According to Fabozzi (2006), Hull (2005) and Martellini et al (2004), Black-Scholes model assumes

lognormal distribution of asset price at maturity.

Key to equations:

C/2	=	Semiannual coupon payment;
Y/2	=	Semiannual coupon yield;
d	=	The actual number of days between settlement and the next coupon Payment;
d'	=	The number of days in the coupon period
n	=	Number of coupon payments remaining till maturity
N	=	Number of years remaining till maturity
M	=	Maturity value.

Asset Pricing and Financial Derivatives

According to Hull (2005), a derivative is a financial instrument, the price of which is derived from the price of another financial product called underlying instrument. The role of financial derivatives in pricing financial instruments is of unique importance to financial intermediaries and other stakeholders. Financial derivatives are now available on a vast number of financial securities including equity, fixed-income products, currency, commodities and market indices.

While equity and currency derivatives have seen a moderate growth over the past two decades, fixed income and commodity derivatives have seen the most pronounced transformation. Transformation of fixed income derivatives has ushered in a new set of financial assets with varying degrees of pricing difficulties according to Hull (2005). These new assets class or financial securities include: CDO, collaterized loan obligations (CLO), collaterized bond obligations (CBO), CSO, and CDO of CDOs. More traditional fixed-income derivative assets include interest rate swaps, options, futures and swaptions. Other category of similar assets belongs to Credit Derivative financial securities. These include: Total Return Swaps, Credit Return Swaps and Credit-Linked Notes. Black-Scholes mathematical equations and their modified versions are being used extensively in pricing a vast majority of these financial instruments derivative.

It must be emphasized that some of the financial securities highlighted above are not yet being traded in Nigeria due to legal and other infrastructural impediments. It is therefore imperative for monetary policy makers in Nigeria to either set up financial derivatives department or provide adequate incentives for private financial houses to facilitate their introduction. The need to monitor derivatives practitioners is

overwhelming. This is because of the high-risk nature that derivatives instruments connote. Representations should be made to law makers with the intention of removing legal barriers that impede application of derivatives in Nigeria's financial markets.

The very nature of Nigeria's economy - gas, oil, cocoa, cassava, rubber and others actually provides ample and genuine opportunities for futures, options, swaps and other derivative instruments to be actively traded in Nigeria's financial markets. Such move would further widen and deepen Nigeria's financial sector and create a new breed of high-caliber professionals with which to take future challenges. If properly taken, such move will ensure that Nigerian financial markets are adequately and quickly integrated within the global financial system. This is in line with vision 2020 currently being embarked upon by the present administration and its entire team.

According to Hull (2005) and Fabozzi (2006), while derivative products are financial assets in themselves, they are often acquired for specific purposes in a financial circle. Motivations for acquiring financial derivative products vary significantly and include the following:

Motivations for Financial Derivatives:

- Risk management
- Speculation
- Reduced transaction costs
- Regulatory arbitrage
- Financial engineering
- Enhancement of OTC transactions

Each of these motivations occupies separate areas of research and study in financial circle. Monetary policy makers need to ensure that these risks are identifiable and manageable by finance practitioners. The extent to which the risk factors are manageable depends on availability and nature of derivative instruments that the Nigerian financial system offers and supports.

This is because, as indicated above, derivatives serve as effective risk mitigating measures, and they are indispensable in modern financial markets.

Expectation Theory, Exchange Rate Volatility and Financial Asset Pricing

As indicated earlier, one of the fundamental macro-economic indicators that influence the price of a financial asset, apart from interest rate, inflation and taxation, is the relative value of a national currency in relation to other major international currencies. This, technically, is referred to as exchange rate. Like the price of any financial asset, exchange rate is subject to immense volatility and (according to Levich (1985), its value is influenced by the mechanism of fundamental market indicators in a market economy. In a market where exchange rate is determined by market forces, the effect of expectation in shaping future direction of exchange rate can be severe. Where financial sector occupies a significant position in the composition of major economic activities as is the case in modern Nigeria, then the influence of exchange rate expectation in determining the value of assets can even be more severe according to Blanchard et al. (1982).

When the value of a currency depends on its expected rate of change as well as on the market fundamentals, its behavior will fundamentally be different. In such a situation, the current level of exchange rate will relate to a weighted sum of current and expected future values of the fundamental variables. The weights will decline geometrically as we go forward in time starting with a weight of unity on the current value of fundamentals according to Copeland (2005), and Muth (1961).
As the Nigerian economy becomes increasingly integrated with the global economy, the value of its currency will depend crucially on the prospective capital gains or losses that the financial market anticipates. This in turn will determine how assets' values are perceived in relation to other market regions. This concept underlies the purchasing power parity which forms one of the fundamental principles that help shape international exchange rates. Monetary policy makers in Nigeria will need to devote substantial attention to ensuring that exchange rate policy connotes a healthy macro-economic outlook for the country. Exchange rate plays a very important and crucial role in categorizing a country as being investable or non-investable in investors' communities.

Copeland (2005), and Blanchard et al. (1982) argue that one key effect of exchange rate policy on financial assets is the fact that, because exchange rate expectation can add to, or drain value from net worth of an asset, its valuation is capable of triggering frenzied attacks on financial assets by speculators and/or arbitrageurs looking to make money in short-selling or long-buying of vulnerable assets in a series of derivative maneuverings. In this regard, the need to prevent anticipation of erratic movements in exchange rate of the Naira needs to be maintained at all times by the authorities concerned.

As a result of the on-going banking consolidation and reforms, Nigerian financial institutions are becoming increasingly integrated with the global financial markets. As such, the role of the Central Bank of Nigeria in determining monetary injections and/or withdrawals will gradually start to diminish. This will be replaced by the need to ensure a coherent and highly integrated network of monetary and macroeconomic policies that guarantee a balanced and prudent financial-economic system for Nigeria within the global economic and financial system.

Conclusion

The issue of asset pricing is of tremendous importance particularly for an economy like Nigeria that is accelerating towards global financial integration. Asset pricing efficiency needs to be maintained by the monetary policy makers. This is because overvalued assets are likely to keep foreign investors at bay and local ones will be encouraged to seek shelter abroad for their assets. In the same vein, assets that are undervalued are likely to cause long-run macroeconomic distortions in the market. In a free market economy, any anomaly in asset pricing will be corrected by market participants as the market seeks to equilibrate itself.

Financial derivatives have the potential to mitigate against asset-pricing volatility. As such they play very crucial roles in correcting anomalies in asset pricing mechanism. Interest rates, rates of inflation and exchange rates are fundamental macroeconomic indicators that actively influence market value of financial assets. The role of monetary policy makers in ensuring that these economic indicators are synchronized, integrated and carefully balanced is overwhelming. Again for an emerging economy like Nigeria, attending to the issue of asset pricing and its volatility can not be less relevant and timely.

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