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Macro-Prudential Regulation and Effective Monetary Policy

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I. Introduction

The recent global financial and economic crisis exposed the fragilities, risks, interconnectedness, and structural rigidities inherent in domestic financial systems and how these can impact on global financial stability. The crisis also highlighted the inadequacies of the price stability objective and micro-prudential regulation in guaranteeing a healthy financial system, and the fact that regulators must worry about the systemic issues underlying the stability of the financial system. As a result, excessive leverages leading to build-up of financial imbalances provided a barometer for measuring financial instability. Financial deepening, complex innovative financial instruments and the integration of markets created the ease of financial contagion in fragile economies across borders to economies with overtly strong financial markets and economic fundamentals.

In the build-up to the recent global financial and economic crisis, anecdotal evidence suggests that poor monetary policy, complemented by a reliance on micro-prudential supervision could lead to a crisis of enormous dimensions, unless checked by more encompassing complementary policies. The set of these complementary policies, developed following the 1997 Asian financial crisis, provided the rationale for rethinking micro-prudential supervision as a pragmatic framework for financial stability, especially within a globalized financial system. Thus, Crockett (2000) reasoned that micro-prudential supervision, which hitherto, had been traditionally directed to protect depositors and investors, could be redesigned towards maintaining financial stability by "marrying the micro and macro- prudential dimensions of financial stability". Following this, the World Bank in a series of seminar papers examined the viability of macro-prudential regulation in ensuring financial stability. The solution toolkit of the recent global financial crisis enveloped macro-prudential policy as forming the nucleus in discussions on the assessment of health and safety of the financial system as well as the prevention of future crises. Consequently, the IMF programme for the assessment of systemic financial stability now relies more on macro-prudential policy in determining financial system stability.

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Institutional macro-prudential policy elicits a number of pertinent questions. These questions relate to concerns about the appropriate institutional framework for implementing macro-prudential policy, the level of interaction of a macro-prudential policy with other policies, especially, monetary policy, and the optimisation of the relationship between monetary and macro-prudential policy and the point of inflexion at which interaction is maximised.

This paper makes a bold attempt to examine some of these issues within the narrow context of monetary policy. Following this introduction, Section 2 examines some conceptual issues including the institutional framework for monetary and macro-prudential policy. Section 3 discusses the objectives and instruments of monetary and macro-prudential policy including indicators of systemic risk, while Section 4 examines at the interaction of macro-prudential with monetary policy and how this could be enhanced. In Section 5, the experiences of other countries with macro-prudential regulation are presented and lessons drawn for Nigeria. Section 6 concludes the paper and provides insights for an effective macro-prudential policy framework for Nigeria.

II. Conceptual Issues and Institutional Framework for Monetary Policy and Macro-Prudential Regulation

II.1 Some Conceptual Issues

Monetary and macro-prudential policies are an integral part of the macroeconomic and financial system management framework. The task involves a delicate mix of policies with significant overlaps. Since the objectives are not mutually exclusive, substantial conflicts exist as well as complementarities, requiring close coordination and collaborations with other stabilisation policies.

The task of regulating the financial system to ensure its safety, soundness and viability has always been done within a micro-prudential framework in which financial stability is seen as the sum of the health of individual institutions. However, the global financial crisis revealed the inadequacy of this approach to financial stability. The key weakness of the existing supervisory framework is that it is largely micro-static (Crockett (2000); Borio (2003) and uses a partial-equilibrium framework to regulate individual financial institutions to prevent their costly failure. In contrast, macro-prudential regulation recognizes the importance of general-equilibrium effects, and seeks to safeguard the financial system as a whole. Macro-prudential policy is, therefore, the approach to financial regulation aimed at mitigating the systemic risk within the financial system. The consensus around this view is that the overarching orientation of financial regulation should tilt towards the financial system as a whole and not just the well-being of individual institutions.

II.2 Institutional Frameworks for Monetary Policy

Model 1: Full and complete responsibility lies with the central bank which sets the policy rate, targets and independently chooses the instruments.

Model 2: Responsibility is shored with the fiscal outhority, but the central bank carries out operations – jointly sets targets and consult on policy rate and choice of instrument.

II.3 Institutional Framework for Macro-Prudential Policy

To be effective, macro-prudential policy should be anchored on a well-developed institutional framework with specific mandate and structures for accountability. Authority must also be provided with adequate incentives to enable an alignment of the macro-prudential instruments and objectives.

Three essential characteristics of macro-prudential policy are particularly critical in defining the institutional mandate. Firstly, Macro-prudential measures for fighting cyclical risks are unpopular and likely to meet resistance from the market. Since macro-prudential regulation suffers from "inaction bias" stemming from the high cost of mocro-prudential measures, the benefits of such measures can only be observed in the long-run and may not be apparent.

Secondly, macro-prudential regulations must operate alongside other policies such os micro-prudential, monetary and fiscal policies. There is need for coordination and cooperation among the different institutions responsible for these policies, particularly in areas of informotion shoring. The macro-prudentiol authorities also need powers to collect dato from both finoncial and non-finoncial institutions and to designote certoin institutions as systemicolly important and subject them to odditionol macro-prudential scrutiny.

Thirdly, the recent financial crisis highlighted concerns obout the copocity of central banks to adequotely monitor oll the different risk components within the economy, in particular when bank subsidiaries, products and functions cut ocross the entire spectrum of finoncial services, with some outside the regulatory purview of the central bank. Consequently in some jurisdictions, the scope of bonking operations wos reviewed and scaled down to core banking functions.

In the post-crisis era, emphasis has shifted to stronger coordinotion and cooperation amongst regulators across the financial services. As a result there is a rethink and review of the regulatory framework for the entire financial sector. This clearly delineates regulatory domain, coordination areas and mechanisms to facilitate inter and intra agency, collaboration with a view to ensuring effective mocro-prudential regulation. As a consequence of the above, the institutional boundaries between central banks and other financial regulatory ogencies have been remapped. Besides, several models have emerged as institutional arrangements for macro-prudential policies and regulotion vary substantially across countries.

Table 1

Stylized Models for Macro-Prudential Policy

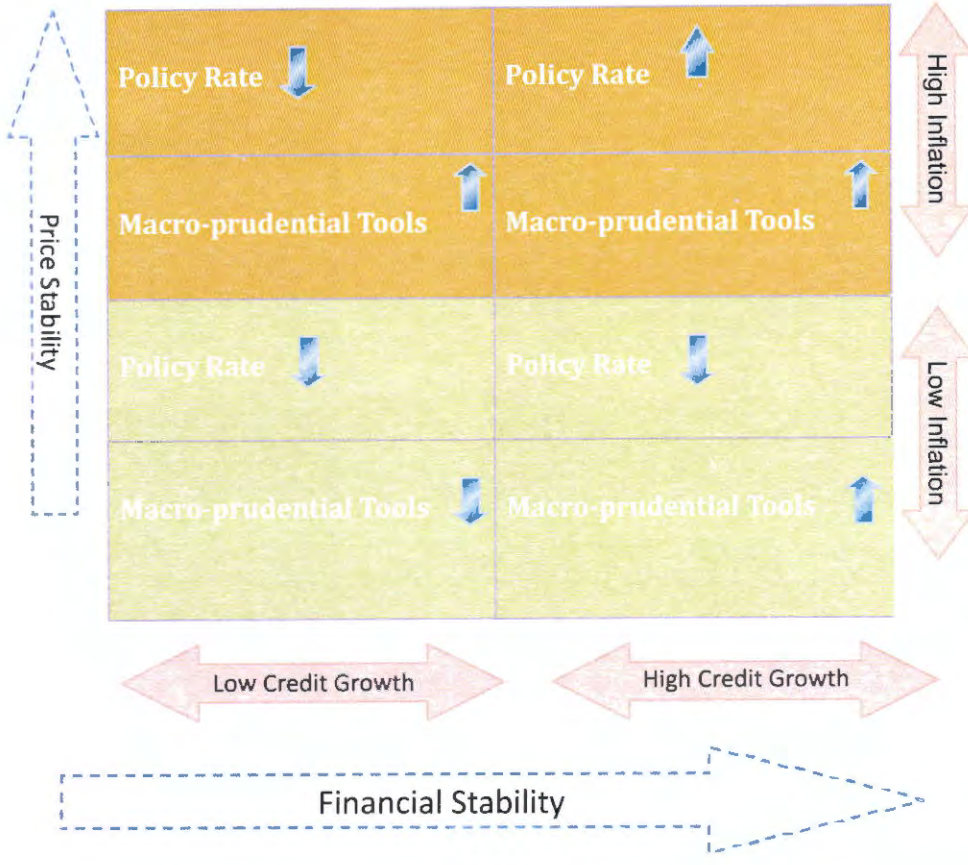
Features of the Model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
The locus of financial regulation and supervisory functions and extent of integration with the central bank	Full (at a Central Bank)	Partial	Partial	Partial	No	No (Partial*)	No
The ownership of the macro-prudential mandate	Central Bank	Committee "related to central bank"	Independent committee	Central Bank	Multiple agencies	Multiple agencies	Multiple agencies
The role of the fiscal authority and policy in macro-prudential policy	No (Active*)	Passive	Active	No	Passive	Active	No (Active)
The degree to which there is organizational separation of decision making and control over instruments	No	In some areas	Yes	In some areas	No	No	No
Existence of a coordinating committee tasked with the coordination of the institutions responsible for macro-prudential regulation	No	No	No (Yes*)	No	Yes	Yes (de Facto**)	No
Examples of specific model countries/ regions	Czech Republic, Ireland (new), Singapore	Malaysia Romania Thailand United Kingdom (new)	Brazil* France (new) United States (new)	Belgium (new) The Netherlands Serbia	Australia	Canada Chile Hong Kong SAR* Korea** Lebanon Mexico	Iceland Peru Switzerland

Source: Adapted from Towards effective Macro-prudential Policy Frameworks. An Assessment of Stylized Institutional Models. Page 15 by Jácome, P. M., Nier, E. W. and Osiński, J. (2011).

III. Objectives and Instruments of Monetary and Macro-Prudential Policy and Indicators of Systemic Risk

Macro-prudential policy requires a stable macroeconomic environment dictated by a combination of coordinated policies to deliver optimal results (Crockett, 2000; Borio, 2003). Figure 1 illustrates a coordinated optimal macro-prudential and monetary policy framework.

Figure 1
Effective Monetary and Prudential Policy Integration



Macro and micro-prudential supervision differ in terms of their objectives and treatment of risk (Borio, 2003). Traditional micro-prudential regulation seeks to enhance the safety and soundness of individual financial institutions, as opposed to the macro-prudential policy, which focuses on the entire financial system. In micro-prudential supervision, risk is deemed an exogenous factor because it is assumed that triggers of financial crises has its origin emanate outside the financial system. In macro-prudential policy, however, risk is endogenous and derives within the system. In line with this reasoning, macro-prudential policy addresses the interconnectedness of individual financial institutions and markets, and their common exposure to risk factors focusing on the pro-cyclical behaviour of the finoncial system to engender stability. Borio (2003) suggested some stylized characterisation of the different nature of the two perspectives.

Table 2: A Comparison of The Macro and Micro Prudential Regulation

Characteristics	Macro-prudential	Micro-prudential
Proximate Objectives	Limit finonciol system-wide distress	Limit distress of individual institutions
Ultimate Objectives	Avoid output gap cost	Consumer (investor/depositor) protection
Characterization of Risks	Dependent on collective behaviour (endogenous)	Independent of "individual agent's" behavior
Correlation and common exposure across institutions	Important	Irrelevant
Calibration of prudential controls	In terms of system-wide risk, i.e. top-down	In terms of risks of individual institutions i.e. bottom-up

Source: Borio (2003).

III.1 Monetary Policy: Objectives and Instruments

Monetary policy is the combination of measures designed to regulate the value, supply and cost of money in line with the level of economic activity (CBN, 2009).

III.1.1 Objectives of Monetary Policy

The objectives of monetary policy for most central banks include any or a combination of price stability (inflation, interest and exchange rates); low

unemployment; balance of payments viability; and achievement of economic growth and development. In recent times, however, a good number of central banks have tended towards price stability as the primary goal of monetary policy.

III.1.2 Instruments of Monetary Policy

The key instruments of monetary policy include: open market sales/purchases of financial securities; reserve requirements, interest rate adjustments; foreign exchange market interventions; and discount window operations. Typically, monetary policy is designed to influence interest rate, exchange rate and its expectations as intermediate variables, to impact on the ultimate goals of inflation, output or moderation of the business cycle in general.

III.2 Macro-Prudential Regulation Policy: Objectives and Instruments

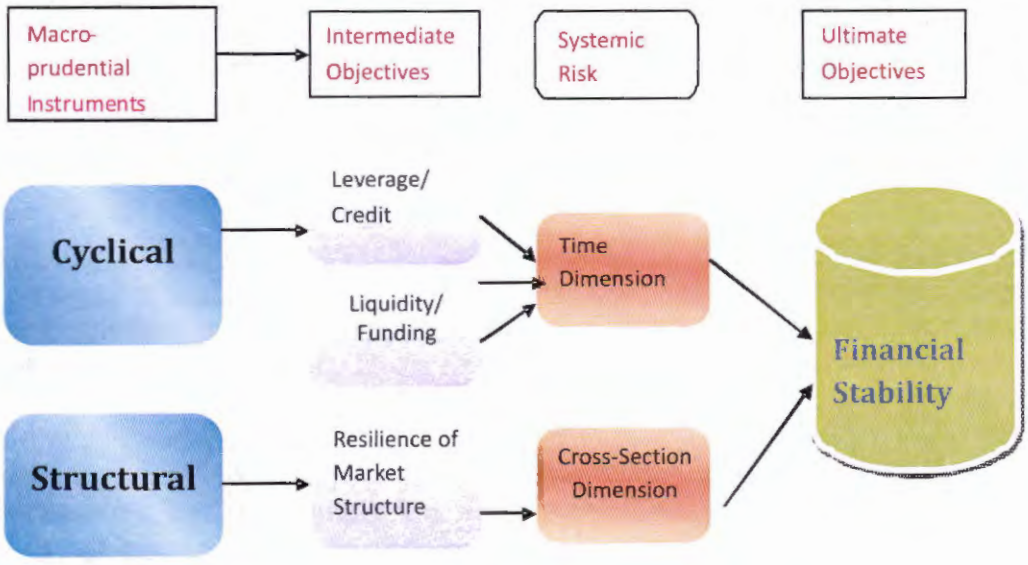
III.2.1 Objectives of Macro-Prudential Regulation

There is currently no consensus on the objectives of macro-prudential policy. However, the general view is that it involves a reduction in the risks and macroeconomic costs of financial instability. A more explicit rendition is that macro-prudential policy moderates systemic risks by explicitly addressing the inter-linked exposures of financial institutions, and the pro-cyclicality of the financial system (Caruana, 2010). Thus, macro-prudential regulation is an approach to financial regulation aimed at mitigating the risk of the financial system as a whole otherwise called "systemic risk" or the reduction in the accumulation of financial risks, so as to reduce the probability of a financial crash or mitigate the impact of a crash if it does occur (Jacome and Nier, 2012). Following the European Systemic Risk Board (ESRB), we define systemic risk as the risk of disruption in the financial system with the potential to have serious negative consequences for the real economy. An example of such a disruption is a credit crisis, in which losses suffered by banks and other lenders cause a curtailment of credit to households and firms that in turn depress overall economic activity.

Aggregate weaknesses arise when the financial sector as a whole becomes overexposed to the same risks such as credit, market or liquidity. Also, the failure of an individual institution can create systemic risk when it impairs the ability of other institutions to continue to provide financial services to the economy. Systemic institutions include not only large banks, but also those institutions that provide critical payment and insurance services to other financial institutions. All leveraged providers of credit, regardless of size, are included in the purview of macro-prudential policy because it is their collective weakness that can affect the provision of credit to the economy as a whole (Jacome and Nier 2012).

The intermediate objectives of macro-prudential policy are constructed to address the time and cross section dimensions of systemic risk. The time dimension deals with the evolution of aggregate risk in the financial system over time and refers to the tendency for financial agents to take excessive risks in economic boom and become overly risk averse during recessions. This behaviaur manifests in the cyclical patterns in the leverage and maturity mismatch positions in the financial system. The cross section dimension refers to the distribution of risks across the financial system at any point in time, i.e. the interconnectedness and resilience of the market structure. Based on these two dimensians, the follawing intermediate objectives could be identified:

Figure 2: Objectives and Instruments of Macro-Prudential Regulation



III.2.2 Instruments of Macro-Prudential Policy

Most macra-prudential policy instruments such as loan-to-value ratio, dynamic loan loss provisioning and debt-to-income ratio were designed to prevent the pro-cyclicality of the financial system on pivotal assets and liabilities. Other instruments like counter-cyclical capital requirement is designed to avoid excessive balance-sheet shrinkage from banks in trouble while time-varying reserve requirements is used to control capital flows with prudential purposes, especially for emerging economies. Time-varying leverage ratio, cyclically-dependent funding liquidity requirements, Foreign Exchange (FX) reserve requirements, and currency mismatch are also in the policy toolbox.

Instruments to prevent the accumulation of excessive short-term debt include: liquidity coverage ratio; liquidity risk charges that penalize short-term funding; capital requirement surcharges proportionol to size of maturity mismatch; minimum haircut requirements on asset-backed securities; limits on open foreign exchange positions; and constraints on the type of foreign currency assets. To ensure the resilience of the infrastructure of the financial system, concentration limits and changes in sectoral risk weights are used.

Using **Dynamic Capital Buffer,** financial institutions are required by regulators to maintain a certain amount of capital (normally equity and retained profits) to enable them obsorb losses on loans or securities. They are further required to add to their capital when there are signs of unusuolly strong credit growth or when there are signs of a credit-driven asset price boom.

Under **Variation in Sectoral Risk Weights**, regulators compel systemically important financial institutions to add capital to caver new loans in sectors that are building up excessive risks. For example, Turkey recently increased requirements for new lending to households to stem high loan growth in that segment.

Dynamic Provisions require banks to set aside money to cover loan losses when credit losses are relatively low to position bank balance sheets to absorb losses that build during dawnturns. A dynamic provisioning regime was introduced in Spain in 2000 and more recently in Chile, Colombia, Peru and Uruguay (Jacome and Nier, 2012).

Measures Targeted at Foreign Currency Lending are designed to mitigate the negative impact of currency appreciation on foreign loans to unprotected customers. The danger of a rise in foreign currency value heightens credit risk for lenders becouse repayment becomes more expensive. Macro-prudential measures to reduce these risks include portfolio limits on foreign currency lending and other targeted restrictians, such as requiring more capital and tighter loon-to-value and debt-to-income ratios for foreign currency loons.

Liquidity Requirements are especially useful when funding is easy to obtain, an increase in required buffers of liquid assets (those that can be easily and quickly converted to cash) provides cash reserves that can be drawn on when funding dries up. New Zealand and Korea, recently intraduced such measures

Loan to Value and Debt Service to Income ceilings are very handy when monetary policy is tight. Administrative rules that limit bank lending such as caps on loon-to-

value ratios and debt service to income ratios are added to traditional tools in banking regulation.

Leverage ceilings: are designed to limit asset growth by tying bank assets to equity. The rationale for a leverage cap rests on the role of bank capital as a constraint on new lending rather than the Basel approach of bank capitol as a buffer against loss. Korea's leverage maxima on bank foreign exchange derivative positions introduced in June 2010 is aimed at limiting the practice of banks hedging forward dollar positions with carry trade positions in Korean won funded with short-term US dollar debt (Shin, 2011).

Levy on Non-core Liabilities is designed to mitigate pricing distortions that cause excessive asset growth. The stock of non-core liabilities reflects the stage of the financiol cycle and the extent of under-priced risk in the financial system. The financial stability contribution recommended by the IMF in its report on the bank levy to the G20 leaders is an example of such a corrective tax (Shin, 2011). The levy on non-core liabilities has many desirable features because the base varies over the financial cycle. The levy bites hordest during the boom when non-core liabilities are large and it has properties of an automatic stabiliser even if the tax rate remains constant over time (Shin, 2011).

Systemically Important Financial Institutions

Authorities need to be in a position to address the risk of failure of individual systemically important financial institutions. Most tools currently under consideration in this regard are designed to reduce the likelihood of failure of institutions that are too important to fail. The Financial Stability Board, an international body of regulators set up in 2009, recently announced that a number of financial institutions important to the global economy - mainly banks and large investment banks with worldwide operations - would be subjected to additional capital requirements commensurate with the level of risk the institutions pose to the global financial system. While these additional capital requirements would assist in restraining the growth of such institutions and better prepare them to absorb losses, additional tools to ease the impact of failure of individual systemic institutions would also help (Jacome and Nier, 2012).

III.3 Indicators of Systemic Risk in a Macro-Prudential Policy Framework

In order to measure systemic risk, macro-prudential regulation relies on several indicators. As mentianed in Borio (2003), an important distinction is made between measuring contributions to risk of individual institutions (the cross-sectianal dimension)

and measuring the pro-cyclicality of systemic risk through times. The cross-sectional dimension of risk con be monitored by tracking balance sheet information, totol assets by their composition, liability (financial accounting) and capital structure-as well as the value of the institutions' trading securities and securities available for sale. Additionally, other sophisticated finonciol tools and models have been developed to assess the interconnectedness across intermediaries and each institution's contribution to systemic.

The time dimension refers to the evolution of aggregote risk in the financial system over time. It deals with the tendency of financiol agents to assume excessive risk in the upswing and then to become overly risk averse in the downswing. This reveals itself in cyclical patterns in the leveroge and maturity mismatch in the financial system such as the credit and liquidity cycles. To address the time dimension of risk, a wide set of variables are typically used, for instance: ratio of credit to GDP, real asset prices, ratio of non-core to core liabilities of the banking sector, and monetary oggregates. Some early warning indicators have been developed encompassing these and other pieces of financial data (Borio and Drehmann, 2009). Furthermore, macro stress tests were employed to identify vulnerabilities in the wake of identified build-up of risky assets ond portfolios.

IV. Interaction between Monetary Policy and Macro-Prudential Regulation

The primary objective of monetary policy is price stability while that of macro-prudentiol policy is financial stability. In recognition of their close linkages and interdependencies, some central banks are enabled by law to pursue and achieve both objectives. Even in jurisdictions where other agencies have statutory responsibility for financial stability like the United Kingdom, close collaboration and coordination between the regulatory institutians is imperative[3].

Given the conflicting objectives of monetory and macro-prudential policy, there are two sides to the relationship:

(1) A mutually reinforcing relationship in which monetary policy sets the overall conditions for demand and supply of credit and other assets wherein lies a major source of finoncial system vulnerabilities, and macro-prudential policy facilitates financial system stability and improves the transmission of monetary policy impulses and;

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[3] The current interest in macro prudential regulation actually stemmed from the recognition that a regulatory gap no particular authority had responsibility for monitoring and managing systemic risks-contributed significantly to the recent wave of financial crises.

(2) An independent pursuits of price stability through monetary policy and financial stability using macro-prudential policy resulting in conflicting actions that weakens or prevent the realization of either of the objectives.

IV.1 The Economy's Loss Function[4]

Thinking in terms of an economy's loss function enables us to demonstrate the nexus between monetary and macro-prudential policy. Consider a loss function in which price stability and financial stability measures are the key variables, respectively as the rate of inflation (π) and a composite index of financial soundness (s). Our loss function may be stated as:

$$L = \alpha(s - s^*)^2 + \sigma(\pi - \pi^*)^2;$$

Where: α and σ are weights attached to financial stability and price stability, respectively, and s^* and π^* are the corresponding targets or desired levels.

Macroeconomic management is about minimising the deviations of both variables from their targets. That is using macro-prudential policies to minimise $(s - s^*)$ and monetary policy to minimise $(\pi - \pi^*)$. The core issues include:

1. Minimising either $(s - s^*)$ or $(\pi - \pi^*)$ contributes to moderating cyclical fluctuations and so both policies must overlap in terms of the variables they influence-interest rate, liquidity, credit, asset prices-opportunity for synergy in which both macra-prudential policy and monetary policy seek ta minimise a common loss function

2. The weighting of the objectives, however, does matter. The overall loss is a sum of two minimums and so if objectives differ, but ultimate goals coincide, conflict may result leading to sub-aptimal results. The loss functian cannot be optimised if weights do not add up to one. This is passible if; either independent agencies are responsible or twa non- coaperative units of the same agency are separately responsible. The reason is simple; each sets its own agenda and policy recommendations taking the other as given-the weights will not add up to one.

4 A loss function is a disutility function of policymakers which typicolly contains the squared deviation between the actual and desired value of each target variable multiplied by a weight associated with that variable (Mayer, 2003)

5 We think of this loss function as a composite one for an economy drawing from two separate ones – a monetary loss function in which a central bank seeks ta minimize the deviations of inflation and autput from their targets and a macro-prudential lass function in which the financial stability authority (which could also be a central bank) seeks to minimize deviations between a measure of finoncial soundness and output from their targets. The ecanomy's loss function approximates both.

3. The third relates to the choice of instruments-this presents potentially both opportunity for synergy and conflict. Let us consider the use of capital buffer as an instrument of macro-prudential policy. During a credit boom, this instrument may be deployed as a countercyclical safeguord against a possible burst. It works in two ways: (1) raising additional capital is costly and the transfer of such cost should moderate demand for credit thereby moderating accumulation of assets by financial institutions and; (2) should a burst occur, financial institutions would be able to absorb losses. Now, if the deployment of this instrument coincides with a period of tight monetary policy, then it works for both. Likewise, by setting interest rates (discount window operations), monetary policy can alter liquidity conditions that may work for the financial stability or against it depending on the direction and the orientation of macro-prudential policy. An alternative scenario results in a conflict of interest.

4. Sources of deviations overlap. For example, excessive build-up of assets (credit) leads to the composite index of financial stability (s) deviating from its target (s^*). Likewise, excessive credit creation leads to overheating money supply expands and more inflation results leading to higher deviation between inflation (π) and its targets (π^*).

5. Ultimately, the effectiveness of monetary policy depends on the stability of the financial system, which in a bilateral sense, depends on monetary or mocroeconomic stability. This summarises the case for close coordination of both monetary and macro prudential policy.

IV.2 Models of Interaction

Monetary policy and mocro-prudential policy are closely linked to other stabilization policies in terms of their objectives, instruments, transmission mechanism, ultimate goals and sources of shocks. Regardless, this close connectedness as a double edged sword can be a basis for synergy or a recipe for conflict. Two models of interaction are considered here viz: a cooperative solution and a non-cooperative game.

IV.2.1 The Cooperative Solution Model

This reformulates the problem of optimal interaction between monetary and macro-prudential policy in terms of the minimisation of a common loss function where both policies aim to generate an anti-cyclical shield. Macro-prudential policy tends to take a preventive course while monetory policy assumes greater corrective stance.

In times of a financial crisis, for example a negative shock to the supply of loans, monetary policy comes handy under a cooperative game through measures such as reduction in bank reserves, policy rate, and establishment of a special discount operation and repurchase of financial securities. At such times, most macro-prudential instruments, especially those that are crisis preventive, like capital buffers (or any form of countercyclical capital requirements) or Loan to Value Ratio (LVR) can no longer be freshly deployed. By lowering, capital requirements, macro-prudential policy can insulate economic growth by averting deleveraging. In normal times, however, macro-prudential policy plays a nominal role.

The prospective orientation of macro-prudential policy also compliments monetary policy such that adjustments in normal times when the economic cycle is driven by supply shocks may be possible without jeopardising the price stability objective. The basis for complementarity under the cooperative solution is the pursuit of a 'common objective' represented by the economy's loss function. Information sharing and policy coherence are two indispensable elements. This approach yields optimal solution to the minimisation problem.

IV.2.2 The Non-cooperative Model

This formulates the problem in terms of two independent actors, both seeking to find a solution to the minimisation problem independently. The two are not necessarily in a competitive or zero-sum styled game, yet, since they do not cooperate, each takes the others actions simply as given and proceeds to optimise its own narrow objective function. It is observed that lack of cooperation between agencies could increase the volatility of policy instruments. Monetary policy continues to focus on price stability ignoring the consequences for financial stability even in the face of a financial shock. By pushing in opposing directions, policy instruments like interest rate in the case of monetary policy and capital requirements in the case of macro-prudential policy become excessively volatile. This volatility of tools leads to a crisis and prevents an optimal solution to the minimization of the economy's loss function.

IV.3 Interaction with Other Stabilisation Policies

The use of macro-prudential policy raises the question of how the instruments relate with other stabilization policies such as the micro-prudential, fiscal and monetary policies that impact on financial stability. Countercyclical macro-prudential policy is linked to other policies that moderate cyclical fluctuations, particularly monetary policy, which bears on such macro-prudential variables as asset prices and credit.

Note that policy coherence is achieved through the choice of instrument and the orientation of policy at any particular time

Since macro-prudential policy has direct or indirect effects on these variables, it influences the transmission mechanism of monetary policy. Under this perspective, the key question is the extent of complementarity between the two policies and whether the likely interactions between these policies create risks of conflicts in the pursuit of price and financial stability.

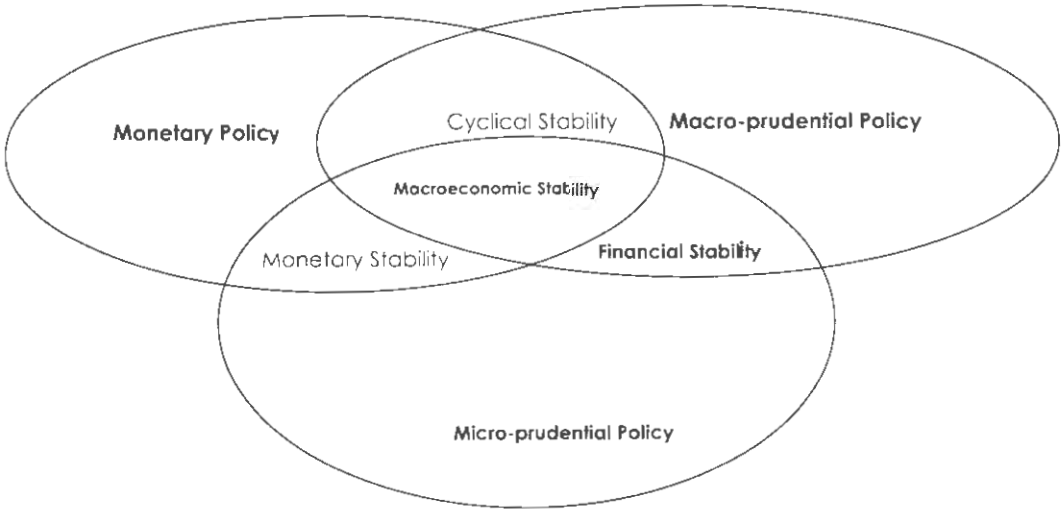
However, as both policies ultimately affect the availability and cost of funds, they can also be viewed as substitutes. In particular, it can be shown that interest rates and macro-prudential tools may both be adjusted to deal with the same macroeconomic or financial shock-for instance, the authorities can raise interest rates or reserve requirements. How much interest rates and macro-prudential instruments would be used would depend in part on the extent to which macroeconomic and financial stability considerations coincide, and the relative effectiveness of these instruments.

A typical example of a conflicting impact would be a situation in which an asset bubble has been identified, while there are strong risks to price stability on the downside. In other words, supply and demand are misaligned in both the credit markets and real economy, in opposite directions. In that case, macro-prudential policy should aim at restricting credit and liquidity growth, but this could lead to an undesired contraction in aggregate output, and to increased downside risks to price stability. The macro-prudential policy would then contribute positively to meet the financial stability objective, but would have an adverse impact on the price stability objective, calling for a policy response, possibly a loosening of the monetary policy stance. Such a loosening of monetary policy, however, may have an adverse impact on the financial stability objective. Lower interest rates could indeed contribute to the build-up of financial imbalances via the so-called 'risk taking' channel. Simply put, very low interest rates may create incentives, for banks, to take on more risk, through the interplay of various channels including asset substitution, pro-cyclical leverage and risk shifting, when banks operate under asymmetric information. Lower interest rates may also contribute to excessive credit growth, with the resulting creation of asset price bubbles.

Lower interest rate leads investors to perceive banks as comparatively less risky and in particular, imply lower credit standards including credit availability to customers who are perceived as representing a higher credit risk. When the regulatory environment is not transparent, a decrease in the level of real interest rate increases banks' risk-taking behaviour, partly because it may facilitate the underpricing of risks which is typical when asset prices rise.

In general, the effectiveness of macro-prudential tools may vary depending on the circumstances in which they are implemented. When the consumer price index (CPI) and asset prices move in the same direction, it is likely that the stance of both monetary and macro-prudential policy would be mutually reinforcing to restore both price and asset market stability. On the other hand, when movements of consumer and asset prices diverge, the two policies become conflicting. In particular, the conflict between the two policies appears to be more severe if rising consumer prices are accompanied by stagnation in the asset market, as shown by the experiences of some countries during the recent global financial crisis.

From Figure 3, it can be shown that the three policies are not orthogonal but when properly coordinated can complement each other for the maintenance of macroeconomic stability. The three policies have their ultimate objective as macroeconomic stability. In that sense, there is agreement on objective. Sound monetary and micro-prudential policy can ensure monetary stability but not the ultimate objective. In the same way, sound macro-prudential and monetary policy only ensures countercyclical resilience but not the ultimate objective. Only well-coordinated set of the three policy measures ensure the attainment of the ultimate objective of macroeconomic stability.



The likelihood of an interaction between macro-prudential and monetary policy originates from the focus of macro-prudential policy-on monetary and financial institutions. These institutions are the central banks' counterparts in their provision of liquidity to the economy and play key roles in the monetary policy transmission mechanism. More importantly, most of the counter-cyclical macro-prudential instruments work through changes in the availability of credit and are akin to reserve requirements. That is, macro-prudential tools operate through effects on bank lending given that changes in bank loans cause investment and consumer spending to change.

Table 3: Macro-Prudential Instruments and Monetary Policy Transmission Channels

Vulnerability	Financial System component		Envisaged macro-prudential instrument	Transmission channels
Leverage	Bank/Deposit taker	Balance sheet	• Capital ratio • Risk weights • Provisioning • Profit distribution restrictions • Credit growth cap	- Bank lending - Broad credit - Balance sheet
		Lending contract	• LTV cap • Debt service/income cap • Maturity cap	- Bank lending
	Non-bank investor			
	Securities market		• Margin/haircut limits	- Collateral
	Financial infrastructure			
Liquidity or market risk	Bank/Deposit taker	Balance sheet	• Liquidity/reserve requirements • FX lending restrictions • Currency mismatch limit • Open FX position limit	- Bank lending - Balance sheet
		Lending contract	• Valuation rules	- Balance sheet - Collateral
	Non-bank investor		• Local currency or FX reserve requirements	- Balance sheet
	Securities market		• Central banks' balance sheet operations	- Collateral - Portfolio
	Financial infrastructure		• Exchange trading	
Inter-connectedness	Bank/Deposit taker	Balance sheet	• Capital surcharge for SIFIs	- Bank lending
		Lending contract		
	Non-bank investar			
	Securities market			
	Financial infrastructure		• Central counterparty	- Interest rate

V. Country Experiences with Macro-Prudential Regulation

In the US, the Financial Regulation Bill, created a new Financial Stability Oversight Council (FSOC), independent of the Federal Reserve, headed by the Treasury Secretary. The FSOC is in charge of identifying, monitoring and addressing systemic risks posed by large and complex financial firms, and of making recommendations to regulators. It is also tasked with responsibility for monitoring domestic and international regulatory proposals, facilitating information-sharing among financial services regulators, designating non-bank financial companies as systemically important, and providing recommendations to the Federal Reserve Board on prudential standards (Beau et al., 2012).

In the UK, following the failure of the tripartite regulatory system, the authorities transferred operational responsibility for prudential regulation from the Financial Services Authority (FSA) to a new subsidiary of the Bank of England. In addition, a new Financial Policy Committee was created within the Bank of England with the responsibility for maintaining financial stability. This committee works with similar international systemically focused bodies such as the European Systemic Risk Board (ESRB) to coordinate macro-prudential policies. The aim of the reform was to bring together responsibility for macro and micro-prudential regulation within a single institution-the Bank of England (Beau et al., 2012).

Following the recommendations of the de Larosière Committee, the European Commission created a European Systemic Risk Board (ESRB) in December 2010 which, like its US counterpart, is independent of the European Central Bank. In contrast, however, the ESRB is not provided with full control of its macro-prudential tools (Beau et al., 2012). As in the US, the ESRB is an inter-agency council, independent of the ECB and only focused on macro- prudential policy. A major difference between the US and the UK is the lack of effective and autonomous regulatory tools. In effect, the ESRB would issue warnings and recommendations. The institutional arrangement which brings together central bank governors and heads of supervision in the EU since January 2011 should ensure both effective coordination and information sharing.

In Paraguay, Brazil and South Korea, central banks have established structures for macro-prudential regulation and supervision, since the global financial crisis. The Central Bank of Poraguay implemented the payment system project aimed at minimizing systemic risk. The measures took effect simultaneously with the migration to an inflation targeting monetary policy framework under which the efficiency of the financial system is a key element in optimizing monetary policy (Jorge and Corvalan, 2011).

Beginning in June 2011, South Korean authorities introduced a sequence of macro prudential measures aimed at building resilience against vulnerability to capital reversals following the associated disruptions to domestic financiol conditions.

Between February 2010 and March 2011, the Banco Central Do Brazil adopted some macro-prudential tools to achieve financial stability and reduce macroecanomic uncertainty. The measures were chiefly designed to moderate credit growth i.e. increase in reserve requirements over demand and time deposits and also of capital requirements over Basel II & III recommendations. Others were new consumer credit operations, measures to moderate exchange rate appreciation through FX interventions and excessive capital inflows e.g. tax on financial operations (Correa, 2012).

Table 4: Loan-to-Value and Debt-to-Income Ceiling in Asia's Emerging Markets

Type of Macro-prudential Instrument	Country Applied
Countercyclical Capital Buffers	China
Countercyclical Provisioning	China; India
Loan-to-Value Ratio (LTV)	China, Hong Kong SAAR, Korea, Singapore
Limits on Lending to Specific Sectors	Korea Malaysia, Philippines, Singapore
Capital Surcharge for SIBs	China, India, Philippines, Singapore
Liquidity Requirements/Funding	India, Korea, Philippines, Singapore
Limits on Currency Mismatches	India, Malaysia, Philippines
Loan-to-Deposit Requirements	China, Korea

Source Caruana (2010)

On the other hand Table 5 shows the adoption of dynamic provisioning by country and year of adoption.

Table 5: Dynamic Provisioning in Some Selected Countries

	SPAIN	PERU	COLOMBIA
DATE OF INTRODUCED	Jul-00	Nov-08	JUNE 2000 (COMMERCIAL), JUNE 2007 (COMMERCIAL)
BASED ON	RULE: CREDIT (STOCK AND GROWTH)	RULE: GDP	RULES BASES IN 4 INDICATORS
DISCREET/CONTINOUS	CONTINOUS	DISCREET (ON/OFF)	Continuous
SYSTEM VS INSTITUTIONS	INSTITUTION - SPECIFIC	SYSTEM-BASED	INSTITUTIONS SPECIFIC
THRESHOLDS	FUNDS LIMITS: 10% - 125%	POTENTIAL GDP (5%) IMPLICIT MINIMUM THRESHOLD. CHANGE IN GDP GROWTH ALSO PLAYS A ROLE	IMPLCIT THRESHOLD IN THE PROVISIONING COEFFICIENTS SET BY THE AUTHORITIES
SYMMETRY	YES, GENERIC PROVISION CAN INCREASE OR DECREASE	YES, "PRO-CYCLICAL PROVISIONS CAN INCREASE OR DECREASE	THE USE OF PROVISIONS IN THE DOWNTURN IS SUBJECT TO CONSIDERABLE CONSTRAINTS
USE: INDIVIDUAL OR GENERAL	GENERAL. CAIN SMOOTH PPROFITS IN THE DOWNTURN	GENERAL. CAN SMOOTH PROFITS IN THE DOWNTURN	INDIVIDUAL
AMOUNT	DEPENDS ON SPECIFIC PROVISIONS, CREDIT LEVEL , CREDIT GROWTH AND RISKINESS OF PORTFOLIO	DEPENDS ON RISKINESS OF PORTFOLIO	DEPENDS ON SPECIFIC (INDIVIDUAL) PROVISION; AND RISK INESS OF PORTFOLIO
TAX DEDUCTABLE	YES (1% LIMIT)	NO	YES

V.1 Lessons of Macro-Prudential Regulation for Nigeria

The Central Bank of Nigeria Act 2007 locates the mandate of ensuring both price and financial system stability under the purview of the CBN. This presents an excellent opportunity for clase coordination of monetary and macro-prudential policies and strengthening the case for a CBN-led framework for macro-prudential regulation in Nigeria. However, since the crisis, macro-prudential regulation has emerged as a cardinal issue in financial stability requiring the establishment of independent institutional structures with a definite mandate to deliver.

Even though the most recent global economic crisis was triggered by events in the housing sector, there have been occasians in the past in which financial system crashes had their origins in monetary developments, due to the failure of monetary and macro-prudential supervision, in particular, exchange rate management. The authorities based on existing mandate must front-load macro-prudential regulation on its agenda and design a framework that takes into account existing institutional structures for monetary and fiscal policy coordinatian at policy and institutional levels. This is especially compelling, given the spread of Nigerian banks offshore. Systemic liquidity is critical to financial stability, and it is driven mainly by the monetisation af oil receipts.

Monetary policy therefore has a great leverage on managing system liquidity which could have very important consequences an the effectiveness of macro-prudential policy and for the stability of the financial system. *Nigeria obviously needs a financial stability framework that promotes synergy between macro-prudential policy and monetary policy.*

Table 6: Lessons of Financial Stability Framework: Objectives and Tools

Objectives and Tools	Micro and Macro-Prudential Policy	Monetary Policy	Fiscal Policy
Current	**Limit Distress of Individual banks (micro-prudential)** Quantity/Quality of Capital Leverage ratio Counterparty credit risk Strengthen risk management	**Maintain price stability** Policy rate Standard repos Interest on reserves Policy corridors	**Manage aggregate demand** Taxes Automatic stabilizers Countercyclical (discretionary) approach
Macro-prudential	**Limit Systemic Risk (Macro-prudential)** Countercyclical capital change Forward looking provisioning Systemic Capital change Leverage ratio LTV caps Robust infrastructure	**Lean against booms** Increase policy rate Raise reserve requirements Mop up liquidity **Provide Support on Downside** Decrease policy rate Inject liquidity Quantitative easing Emergency liquidity assistance	**Build fiscal buffers in good times** Reduce debt levels Introduce taxes/levies on financial sector **Provide Financial Sector Support in times of stress** Capital injection Deposit and debt guarantees Bank rescue packages Discretionary stimulus

Macro-prudential policy must deploy a range of tools to address systemic weakness and individual failures. This is because a single tool is unlikely to be sufficient to address the various sources of systemic risk. The monetary authorities or institutions responsible for macro-prudential regulation must be able to tailor specific macro prudential instruments to the particular identified vulnerabilities.

Also, macro-prudential policy framework should encompass a system of early warning indicators that signal increased vulnerabilities to financial stability and a set of associated policy tools that can address the increased vulnerabilities at an early stage. Its pursuit would require the macro-prudential authority to adjust policy tools dynamically, to counter the build-up of risks during upswings and attenuate credit contraction and excessive risk-aversion in downturns.

VI. Concluding Remarks

From a macro-prudential view, the overriding goal of financial regulation goes beyond just protecting insured depositories/investors and maintaining price stability. The task involves mitigating the fire-sales and credit-crunch effects that can arise as a consequence of excessive leverage in the financial system. Containing these effects with just micro-prudential supervision will be difficult. In this paper, we highlighted the need for macro-prudential framework for financial regulation, the objectives and instruments required to implement such a framework, pointing out the importance of policy coordination among the macroeconomic stabilizing policies. Analysis of country experiences show that different jurisdiction adopt different institutional structure for macraprudential regulation. The lessons for Nigeria include the need for a counter-cyclical macro-prudential policy which is adequately aligned with micro-prudential and monetary policies so as to ensure optimal results.

References

Beau, D., L. Clerc and B. Mojon (2012). "Macro-prudential Policy and the Conduct of Monetary Policy", in Macro-prudential Policies beyond Basel III.

Borio, C. and M. Drehmann, (2009). "Assessing the Risk of Banking Crises Revisited", *BIS Quarterly Review*, March.

Borio, C. (2003). "Towards a Macro-prudential Framework for Financial Supervision and Regulation", *BIS working Paper* No.128, February.

Caruana, J. (2010). "Macro-prudential Policy: Working Towards a New Consensus", Remarks at the high-level meeting on "The Emerging Framework for Financial Regulation and Monetary Policy" jointly organised by the BIS's Financial Stability Institute and the IMF Institute Washington DC, 23 April.

Correa, A. (2012). "Macro-prudential Instruments and Monetary Policy: The Brazilian Experience", VIII Meeting of Central Bank Monetary Policy Managers Lima – Peru, 25 – 26 June.

Crockett, A. (2000). "Marrying the Micro and Macro-prudential Dimensions of Financial Stability".

Jácome P. M., E. W. Nier, and J. Osiński (2011). "Towards effective Macro-prudential Policy Frameworks: An Assessment of Stylized Institutional Models" *IMF Working Paper WP/11/250* –, November.

Jacome L. I. and E. W. Nier (2012). "Macro-prudential Policy: Protecting the Whole", http://www.imf.org/external/pubs/ft/fandd/basics/macropru.htm.

Jorge, R. and M. Corvalan (2011). "Monetary Policy and Macro-prudential Measures", Central Bank of Paraguay, http://www.imf.org/external/np/seminars/eng/2012/macro/pdf/corvalan.pdf, FSAP, Paraguay, May.

Mayer, T. (2003). "The Macroeconomic Loss Function: a Critical Note", Applied Economics Letters 10(6), 347-349 BIS *Quarterly Review*, March.

Mordi, C. N. O. (2009). "Overview of Monetary Policy Framework in Nigeria", *CBN Bullion*, Vol. 33 Number 1. January – March.

Shin, H. S. (2011). "Macro-prudential Regulation and Policy", *Proceedings of a joint conference organised by the BIS and the Bank of Korea in Seoul* on January 17 - 18.