Financial Stability: The Role of Regulation and Supervision

A Handbook for Financial Regulators and Supervisors

VICTOR U. EKPU

MINDSET RESOURCE CONSULTING

FINANCIAL STABILITY: THE ROLE OF REGULATION AND SUPERVISION

A HANDBOOK FOR FINANCIAL REGULATORS AND SUPERVISORS

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Find out more at:

https://www.mindsetrc.co.uk/
info@mindsetr.co.uk
www.linkedin/company/mindset-resource-consulting

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LIST OF ACRONYMS

ABS	Asset Backed Securities
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
CAMELS	Capital, Assets, Management, Earnings, Liquidity, Sensitivity to Market Risk
CBN	Central Bank of Nigeria
CBS	Compliance Based Supervision
CCPs	Central Counterparties
CDO	Collateralised Debt Obligations
CDS	Credit Default Swaps
CRAs	Credit Rating Agencies
EWS	Early Warning Systems
FCA	Financial Conduct Authority
FDIC	Federal Deposit Insurance Corporation
FSA	Financial Services Authority
FSB	Financial Stability Board
GSEs	Government Sponsored Entities
IMF	International Monetary Fund
LCR	Liquidity Coverage Ratio
LTV	Loan-to-Value Ratio
LOLR	Lender of Last Resort
NPLs	Non-Performing Loans
NSFR	Net Stable Funding Ratio
MBS	Mortgage-Backed Securities
MPIs	Macroprudential Indicators
OTC	Over the Counter
RBS	Risk Based Supervision
RWAs	Risk Weighted Assets
SIBs	Systemically Important Banks

PREFACE

Financial stability is necessary for sustained long term economic growth. Economic growth cannot be achieved without strong financial systems. Even with sound macroeconomic fundamentals, weak financial systems can destabilize economies, making them more susceptible to external shocks. The interaction of financial markets and the real economy needs close monitoring since the social externalities and knock on effects of instability of the financial system can be very costly. A smoothly operating, stable and efficient financial system is a major pillar for growth, output and employment, which are some of the core mandates of the central banks globally.

This handbook is a compilation of training materials at a capacity building program organized by Mindset Resource Consulting UK for senior staff of the Central Bank of Nigeria (CBN) focused on strengthening financial stability through prudential regulation and supervision following the global financial crisis of 2007-09. It contains a detailed exposition on the concept of financial stability/instability and the role of regulation and supervision in mitigating all kinds of risks emanating from the financial sector with potential spillover effects on macroeconomic stability.

This handbook, which is organized into nine chapters, reviews a great deal of academic literature and cites several relevant regulations and best practices from renowned international regulatory authorities such as those prescribed by the Basel Committee on Banking Supervision (BCBS), the Financial Stability Board (FSB), the World Bank, the International Monetary Fund (IMF), the Federal Reserve System, and the Financial Conduct Authority (FCA). The findings from this review will thus be of immense benefit to financial services regulators and supervisors, senior managers of financial institutions, academics, consultants, banking and finance students, and researchers in policy-making institutions.

Victor Ekpu
Managing Consultant,
Mindset Resource Consulting UK

August 2012

EXECUTIVE SUMMARY

This handbook reviews the role of regulation and supervision in promoting and achieving financial stability. Financial stability is the avoidance of financial institutions failing in large numbers and the avoidance of serious disruptions to the intermediation functions of the financial system to the real economy. The systemic risk rationale and the fiscal costs of crises justify the role of government intervention. The risks to the financial system are numerous and by appropriately applying prudential standards, regulatory authorities can mitigate these risks. Critics of Basel II claim that it is static, procyclical, backward looking and too microprudential focused, and that it contributed to the recent global financial crisis. Basel III is designed to help regulators curtail both micro-systemic and macro-systemic risks that have threatened global financial stability. The new regulatory regime requires banks to hold more capital in times of excessive credit growth to cushion against losses in down times. It also involves more stringent liquidity risk management standards and supervisory monitoring as well as enhanced disclosure.

Since the recent global financial crisis was caused by the interaction of micro and macro elements, regulatory policies should therefore concentrate on covering these interactions if the likelihood of future crises is to reduce. In doing so, regulators must strike a balance between the microprudential and macroprudential dimensions of financial stability. In view of the need for a market-wide perspective of risks, the concerns over financial innovation as well as concerns over the procyclicality of the financial system, this study argues that strengthening the macro-prudential aspect could achieve both the micro and macro-prudential objectives of financial stability, that is, engender the protection of consumers and depositors' funds and at the same time achieve system-wide stability.

Key words: *financial stability, regulation, supervision, risk typology, Basel II and III, global financial crisis, microprudential, macroprudential.*

CHAPTER 1: INTRODUCTION

1.1. BACKGROUND AND JUSTIFICATION

Financial stability is necessary for sustained long term economic growth. Economic growth cannot be achieved without strong financial systems. Even with sound macroeconomic fundamentals, weak financial systems can destabilize economies, making them more susceptible to external shocks. The interactions between financial markets and the real economy need close monitoring since the social externalities and knock on effects of instability of the financial system can be very costly. A smoothly operating, stable and efficient financial system is a major pillar for output, employment, and growth, which are some of the core mandates of central banks globally.

This handbook reviews the role of regulation and supervision in promoting and achieving financial stability. **Financial stability is the avoidance of financial institutions failing in large numbers and the avoidance of serious disruptions to the intermediation functions of the financial system to the real economy**. The risks to the financial system are numerous and by appropriately applying prudential standards, regulatory authorities can mitigate these risks. The systemic risk rationale and the fiscal costs of crises justify the role of government intervention in financial systems.

A critical look at the underlying factors that led to the global financial crisis of 2008/09 showed at the crisis was caused by the interaction of micro and macro elements, and as such it is being advocated that regulatory policies should now concentrate on covering these interactions if the likelihood of future crises is to reduce. In doing so, regulators must strike a balance between the micro-prudential and macro-prudential dimensions of financial stability. Micro-prudential regulation and Macro-prudential regulation are two key phrases that have now gained acceptability among regulators and supervisors worldwide following the recent global crisis. Micro-prudential regulation concerns itself with the safety and soundness of individual banking institutions, while macro-prudential regulation considers the overall stability of the financial system as a whole and its link with the macro-economy. Micro-prudential regulation examines the responses of an individual bank to exogenous risks but does not incorporate endogenous risk. It also largely ignores the systemic importance of individual institutions in terms of its size, complexity, extent of leverage and interconnectedness with the rest of the financial system (Brunnermeier *et al*, 2009). One of the key objectives of macro-regulation therefore is to serve as a countervailing force to the institutional blindness to risk during periods of boom and excessive credit growth and the subsequent rise in risk assessment during periods of subsequent collapse *(the bust)*.

The Basel Capital Accord provides the regulatory architecture for mitigating risks facing banks and the financial system at large. However, many regulators and economists have admitted that the Basel II regulatory framework is highly pro-cyclical because it tends to magnify the business cycle (e.g. Kodres and Narain, 2009) and thus unable to weather the storm in times of financial distress. Other critics of the Basel II framework claim that it is static, backward looking and too micro-prudential focused, and that it contributed to the recent global financial crisis. Before now, the regulatory approach assumed that by safeguarding individual institutions, the entire financial system will be safe. But this approach fails to work in practice, as many banks and other highly

geared financial institutions tend to behave in a manner that jointly undermines the financial system. For example, in times when risk is perceived to be high, selling an asset could be seen as a prudent response by an individual bank. But if many banks follow this approach, asset prices will collapse, and such generalised downswings in asset prices may lead to huge volatility in asset markets.

Prudential regulation of banks is therefore necessary to stem systemic risks by ensuring that banks hold sufficient capital at all times. Basel III is designed to help regulators curtail both micro-systemic and macro-systemic risks that have threatened global financial stability. The new regulatory regime requires banks to hold more capital in times of excessive credit growth to cushion against losses in down times. It also involves more stringent liquidity risk management standards and supervisory monitoring as well as enhanced disclosure. While the individual safety of financial institutions is desirable, the distribution of risk across institutions within the financial system need not be ignored.

The approach, therefore, as will be expounded in this handbook, calls for a strengthening of the macro-prudential aspect of financial regulation to ensure the stability of the entire financial system. Off course, implementing macro-prudential regulation does not come without conflicts and challenges. The formal power of supervisors to collect information, make rules and designate systemically important institutions needs to be specified, assigned and monitored. The cooperation of the macro-prudential policy maker and other regulatory institutions also needs to be fostered if the objectives of macro-prudential regulation, namely the mitigation of systemic risks will be achieved.

1.2. STRUCTURE OF THE HANDBOOK

This handbook contains a detailed exposition on the concept of financial stability/instability and the role of regulation and supervision in mitigating all kinds of risks emanating from the financial sector with potential spillover effects on macroeconomic stability. The paper is organized into nine chapters. After the introduction is Chapter 2, which takes a look at the concepts of financial stability/instability and in particular examines some of the underlying theories of financial stability/instability, the elements of financial stability analysis and how shocks are transmitted between the financial and real sectors of the economy. Chapter 3 examines the economic rationale for financial regulation and supervision. Here, readers will understand the arguments often posed for and against financial regulation, why the regulation of the financial system is important and the kinds of regulation that central banks implement.

In chapter 4, readers are exposed to the various risks banks are faced with and the role of the Basel capital regulation in dealing with such risks. A special feature of this chapter is that it includes some detailed insight into the micro and macroeconomic causes of the global financial crisis and the role Basel II played in the global financial crisis. Readers will also understand from this chapter the changes to capital and liquidity after the crises, which are enshrined in the new Basel III capital framework. Chapter 5 examines the distinction between micro-prudential and macro-prudential perspectives of financial regulation and supervision and why the macro-prudential perspective needs to be strengthened. It also examines the boundaries or perimeters of prudential regulation.

Chapter 6 examines the tools of micro-prudential regulation and their role in limiting the failure of individual financial institutions and protecting stakeholders such as depositors and financial

consumers. Chapter 7 examines the tasks and tools of macro-prudential regulation and supervision, which centers on limiting system-wide disruptions to the economy. Chapter 8 highlights the conflicts between micro-prudential and macro-prudential regulation and the governance challenges faced by authorities in implementing a macro-prudential policy regime. Chapter 9 concludes the study.

CHAPTER 2: UNDERSTANDING FINANCIAL STABILITY/INSTABILITY

2.1. CONCEPTUAL AND DEFINITIONAL ISSUES

This section examines the concept of financial system stability as well as the elements of financial stability analysis. The financial system of any economy consists of *financial intermediaries* (banks, and non-banks), *financial markets* (e.g. money and capital markets), *financial instruments* (savings, loans and securities) and the *users of financial services* (households, firms, governments, investors, traders, and other market participants). Financial system stability in a broad sense means the avoidance of financial institutions failing in large numbers which could cause serious disruptions to the intermediation functions of the financial system: payments, savings facilities, credit allocation, efforts to monitor users of funds, and risk mitigation and liquidity services.

2.1.1. Financial Stability/Instability Defined

Academics and policy makers have provided a plethora of definitions of financial stability/instability. According to Mishkin (1994), financial instability occurs when shocks to the financial system create a breakdown in financial intermediation so that the financial system can no longer provide credit to those economic agents with productive investment opportunities. Crockett (1997), on the other hand, suggested that financial stability could mean the stability of key institutions and markets that make up the financial system. Thus, financial stability requires (i) that the key institutions in the financial system are stable, in that there is a high degree of confidence that they continue to meet their contractual obligations without disruption or external assistance; and (ii) that the key markets are stable, in that participants can confidently transact in them at prices that reflect fundamental values and changes in fundamentals. Inside these broad definitions, financial system soundness can be seen in terms of a continuum on which financial institutions can be operating inside a stable corridor, near the boundary with instability, or outside the stable corridor (instability).

Other authors such as Issing (2003), Foot (2003) and Allen (2005) had suggested that financial stability was related to asset price bubbles, or more generally, volatility in financial market proxies. Indeed, bubbles impair financial markets efficiency, but they do not in themselves constitute a defining characteristic of financial fragility, and more generally financial instability (Bardsen *et al*, 2006). The same argument can be put forward with respect to financial market frictions such as liquidity strains. Imperfections in financial markets increase the likelihood of financial instability occurring, but do not necessarily cause it.

One can classify Minsky's financial instability hypothesis among this group of definitions relating financial instability to asset price bubbles, since he claimed that the inherent financial instability of financial markets was based on the over-optimistic behaviour of economic agents (Minsky, 1978). A bubble is said to occur when the price of an asset exceeds its fundamental or benchmark price. According to Allen (2005), bubbles in asset prices typically have three distinct phases. The first phase starts with financial liberalisation or a conscious decision by the central bank to increase lending or some other similar events. The resulting expansion in credit is accompanied by an increase in the prices for assets such as real estate and stocks. This rise in prices would continue for some time, possibly several years, as the bubble inflates. In the second phase, the bubble bursts and

asset prices collapse, often in a short period of time such as a few days or months, but sometimes over a longer period. The third phase is characterised by the default of many firms and other agents that had borrowed to buy assets at inflated prices. Banking and/or foreign exchange crises may follow this wave of defaults. The difficulties associated with the defaults and banking and foreign exchange crises often cause problems in the real sector of the economy, which could last for a couple of years. There is thus, a significant interaction between the financial system and real sector growth.

2.1.2. Elements of Financial Stability Analysis

Financial stability analysis is intended to help identify threats to financial system stability and to design appropriate policy responses. It focuses on exposures, buffers, and linkages to assess the soundness and vulnerabilities of the financial system, as well as the economic, regulatory, and institutional determinants of financial soundness and stability. It considers whether the financial sector exhibits vulnerabilities that could trigger a liquidity or solvency crisis, amplify macroeconomic shocks, or impede policy responses to shocks. The monitoring and analysis of financial soundness involves an assessment of macroeconomic conditions, soundness of financial institutions and markets, financial system supervision, and the financial infrastructure to determine what the vulnerabilities are in the financial system and how they are being managed.

Depending on the assessment of the extent of the financial system's soundness, policy prescriptions may include *continuous prevention* (when the financial system is inside the stable corridor), *remedial action* (when it is approaching instability), and *resolution* (when it is experiencing instability). The analytical framework to monitor financial soundness is centered on macro-prudential surveillance and is complemented by surveillance of financial markets, analysis of macro-financial linkages, and surveillance of macroeconomic conditions. According to the *Financial Sector Assessment Handbook* (World Bank, IMF, 2005), these four key elements play distinct roles in financial stability analysis.

- *Surveillance of financial markets* helps to assess the risk that a particular shock or a combination of shocks will have on the financial sector. Models used in this area of surveillance include early warning systems (EWSs). Indicators used in the analysis include financial market data and macro-data, as well as other variables that can be used for constructing early warning indicators.
- *Macro-prudential surveillance* tries to assess the health of the financial system and its vulnerability to potential shocks. The key quantitative analytical tools used for macro-prudential surveillance are the monitoring of financial soundness indicators (FSIs) and the conducting of stress tests. These tools are used to map the conditions of non-financial sectors into financial sector vulnerabilities. The analysis also draws on qualitative data such as the results of assessments of quality of supervision and the robustness of financial infrastructure.
- *Analysis of macro-financial linkages* attempts to understand the exposures that can cause shocks to be transmitted through the financial system to the macro economy. This analysis looks at data such as balance sheets of the various sectors in the economy, and indicators of access to financing by the private sector (to assess the extent to which private owners would be able to inject new capital to cover the potential losses identified through macro-prudential surveillance).

- *Surveillance of macroeconomic conditions* monitors the effect of the financial system on the macroeconomic environment in general and on debt sustainability in particular.

The global financial crisis has also brought to fore the strong complementarity between monetary and prudential policies. A sound financial system is a prerequisite for an effective monetary policy; just as a sound monetary environment is a prerequisite for an effective prudential policy. A weak financial system undermines the efficacy of monetary policy measures and can overburden the monetary authorities, and a disorderly monetary environment can easily trigger financial instability and render void the efforts of prudential authorities. From the perspective of the build-up of financial imbalances, the key question is how best to calibrate tools to address the potential excessive pro-cyclicality of the financial system. There is, at least theoretically, a wide range of tools. A sub-set of those most typically regarded as being of a prudential nature would be discussed as well as efforts to promote a better risk management culture, including loan provisioning rules, capital standards, loan-to-value (LTV) ratios, measures to address currency mismatches and, more generally, the intensity of the supervisory review process. It should be noted, however, that a range of instruments considered to be monetary in nature, such as reserve requirements and restraints on lending, could in fact perform a very similar function. Indeed, they have often been operated alongside, or as an alternative to, prudential tools.

In general, assessing financial stability is a complex process. In practice, the assessment requires several iterations. For example, the effects of the financial system on macroeconomic conditions may produce feedback effects on the financial system. The profile of risks and vulnerabilities (ascertained through macro-prudential surveillance) could feed into qualitative assessments of effectiveness of supervision, and those effects, in turn, might influence the analysis of vulnerabilities and overall assessment of financial stability.

2.2. TRANSMISSION CHANNELS BETWEEN FINANCIAL AND REAL SECTORS[1]

A clear understanding of the transmission channels that exist between the financial and real sectors of the economy is crucially important when assessing financial stability. A strong financial system can be seen as one that does not adversely induce the propagation and magnification of disturbances that affect the financial system and those that are capable of withstanding shocks and limiting disruptions in the allocation of saving to profitable investment opportunities. Given the importance of this topic to regulatory authorities, the Basel Committee on Banking Supervision (BCBS, 2011a) had identified three important transmission channels as;

I. The borrower balance sheet channel;
II. The bank balance sheet channel; and
III. The liquidity channel

The first two channels are often referred to as the financial accelerator channel; the third channel emphasizes the liquidity position of banks' balance sheets.

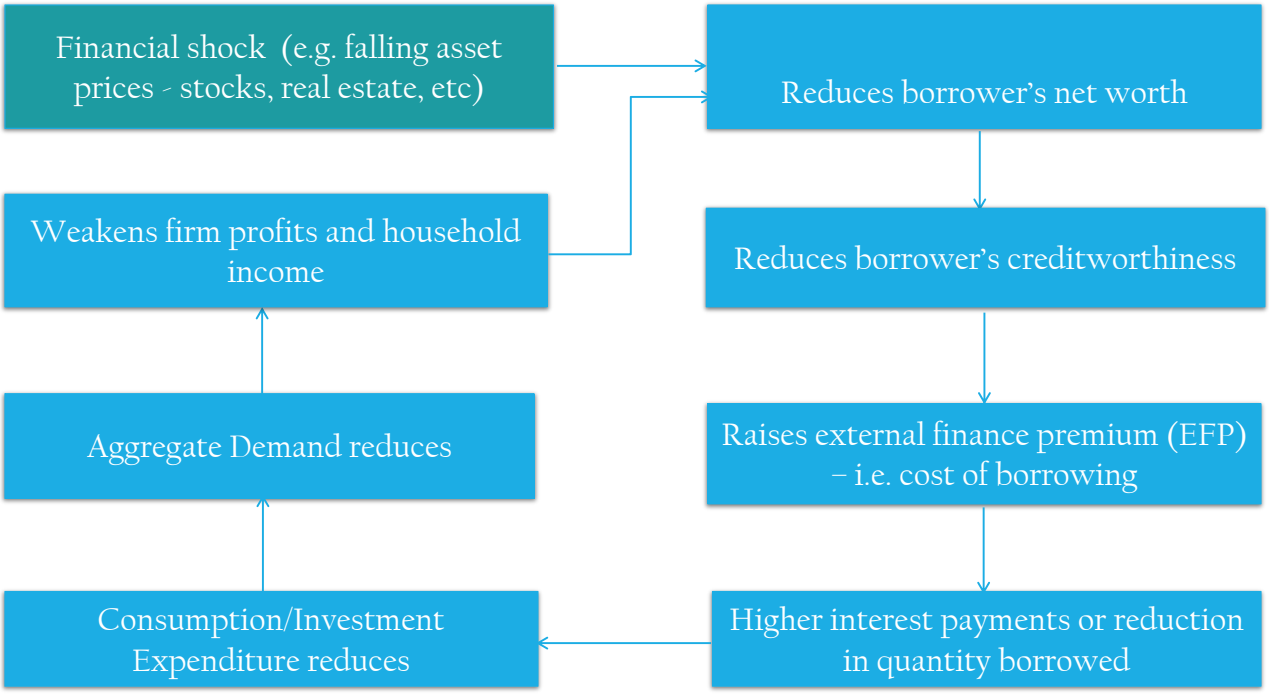
[1] A detailed exposition on the transmission channels between financial and real sectors can be found in Bank for International Settlements (2011a)

2.2.1. The Borrower-Balance Sheet Channel

The borrower balance sheet channel applies to both firms and households. It comes from the inability of lenders to (a) assess fully borrowers' risks and solvency, (b) monitor fully their investments, and/or (c) enforce fully their repayment of debt. There are two mechanisms for the functioning of this channel:

The first mechanism occurs because borrowers face an "*external finance premium*" (EFP). **EFP refers to a positive wedge between the costs of externally and internally raised funds.** This wedge typically depends inversely on borrowers' credit worthiness, which in turn is tied to borrowers' net worth or equity. Any shock that affects the borrowers' creditworthiness will affect their cost of financing and/or quantity of borrowing, which will then affect the volume of borrower's consumption expenditure and hence aggregate demand (See Figure 1).

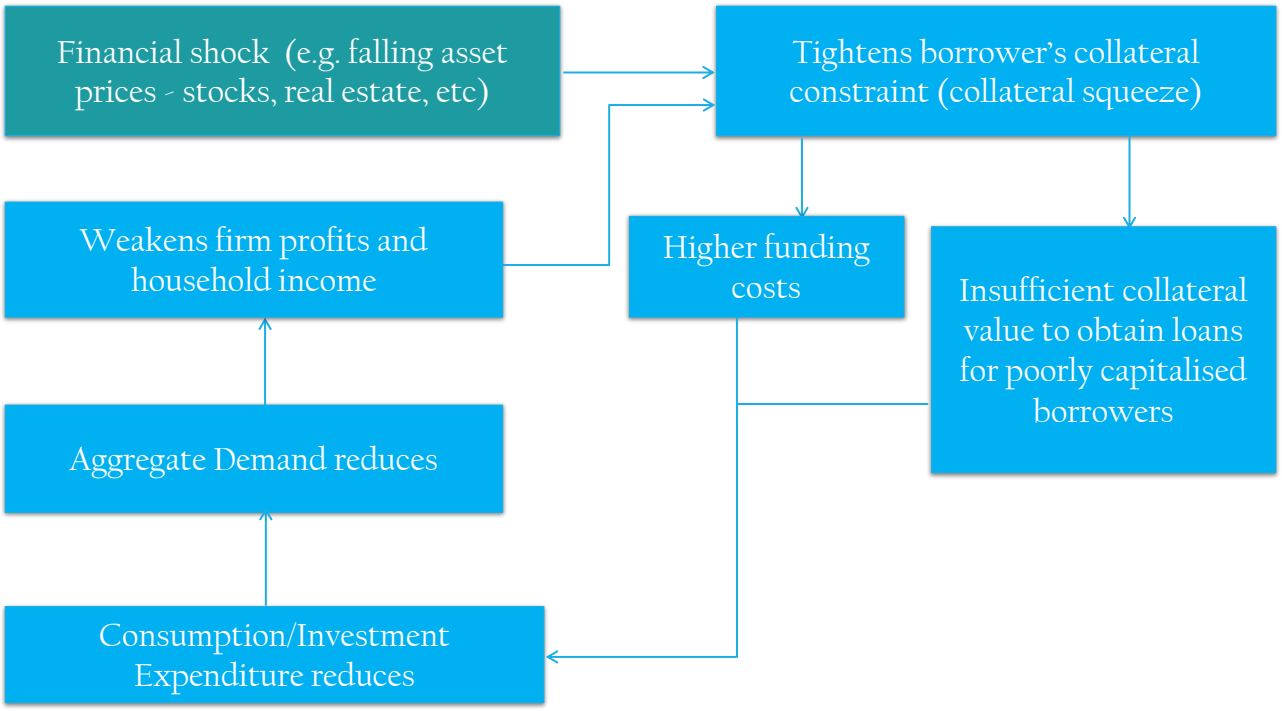
Figure 1: Borrower Balance Sheet Channel and the External Finance Premium (The Interest Rate or User Cost Channel)



Source: Author's own representation based on BIS (2011a)

The second mechanism of borrower balance sheet model arises from the role of assets in providing collateral for loans. Here, any financial shock leading to a fall in asset prices will tighten the *collateral constraint* and reduce loan supply, which in turn lowers production and spending and depresses asset prices farther. Adverse shocks to borrower collateral, which is sometimes called *collateral squeeze*, produce higher funding costs along with some borrowers failing to obtain credit where the effects are most severe for poorly capitalized borrowers. Both of these effects restrain expenditure and result in lower aggregate demand (See Figure 2).

Figure 2: Borrower Balance Sheet Channel and Collateral Constraint



Source: Author's own representation based on BIS (2011a)

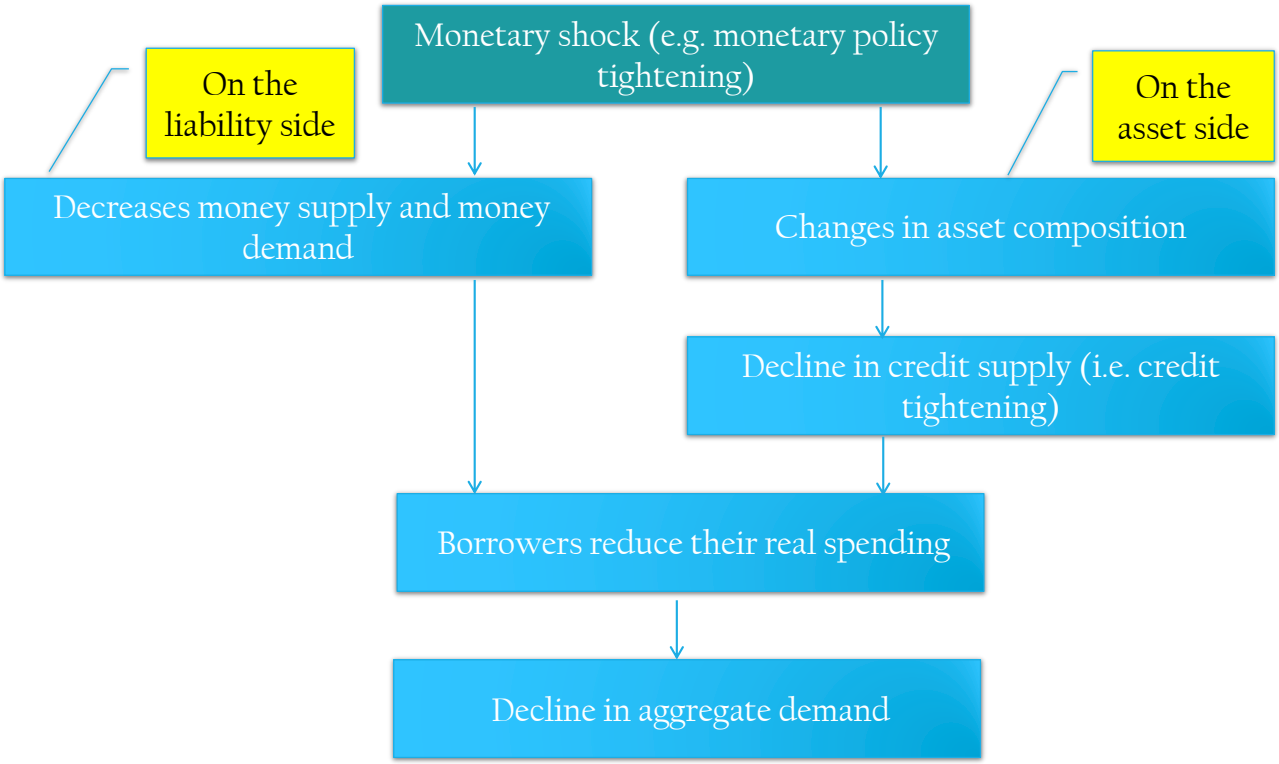
2.2.2. The Bank-Balance Sheet Channel

The bank balance sheet channel predicts that adverse shocks to financial institutions' balance sheets can entail sharp contractions in credit and result in such shocks having magnified effects on economic activity. Two conditions are necessary for such amplified effects to occur: (a) the inability of banks to fully insulate their supply of lending in response to such shocks and (b) borrowers to be highly dependent on banks for credit.

The bank balance sheet channel can be divided into two separate components:

(i) **The traditional bank lending channel**: Here, monetary policy shocks affecting bank balance sheets have effects on the cost and availability of credit through interest rates. For example, a negative monetary policy shock, i.e. a monetary policy tightening leads to decline in credit supply. Through the condition of high dependence on banks for credit, borrowers must reduce their real spending after a tightening in credit conditions by banks. (See figure 3).

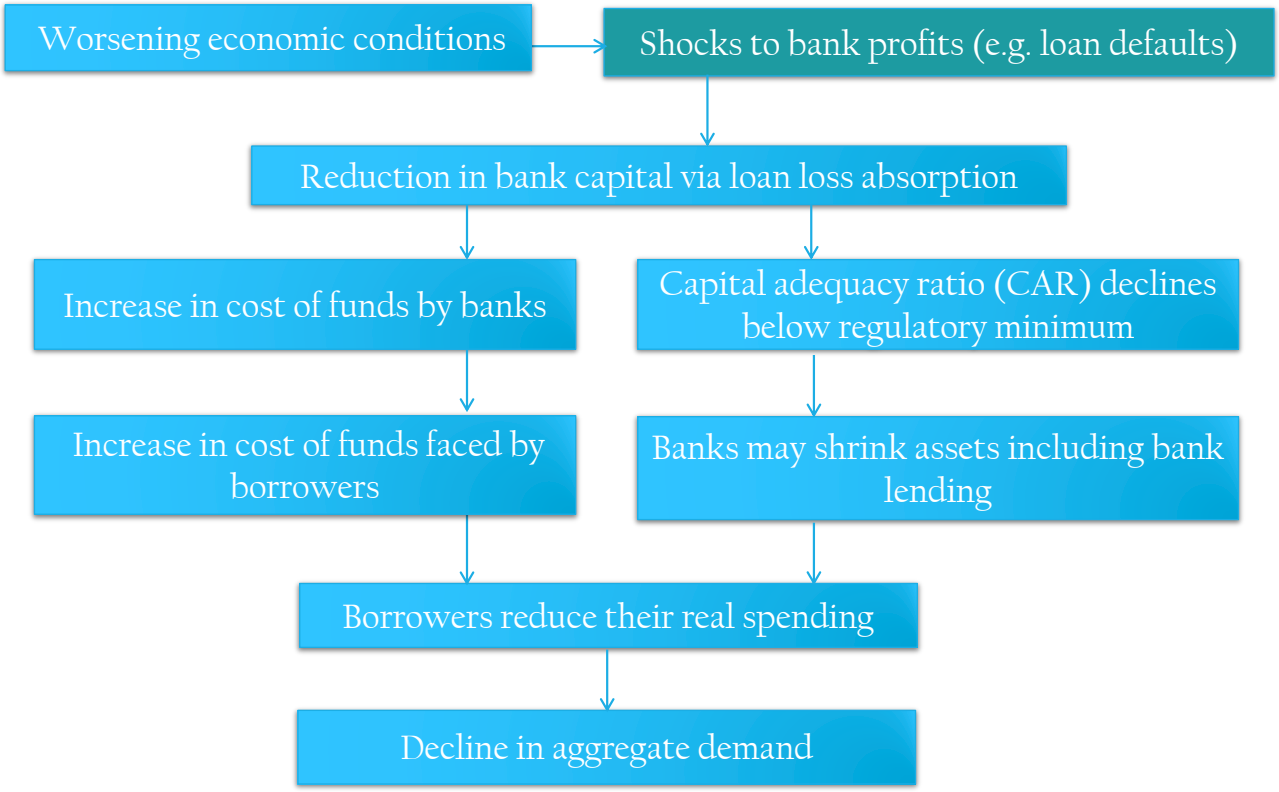
Figure 3: Bank Balance Sheet Channel: Bank Lending Channel



Source: Author's own representation based on BIS (2011a)

(ii) **The bank capital channel:** Here, a reduction in bank capital increases the cost of funds faced by banks and, in turn, the cost of funds faced by borrowers. A further reason why bank capital can affect lending stems from regulatory capital requirements, since they place an upper bound on bank assets and thereby on bank lending. Risk-based capital requirements have the potential to further exacerbate the effects of bank capital on lending. Worsening economic conditions deteriorate the actual bank capital ratio not only via the effect on loan losses on bank capital, but in addition risk-weighted assets also may increase. (See figure 4).

Figure 4: Bank Balance Sheet Channel: Bank Capital Channel



Source: Author's own representation based on BIS (2011a)

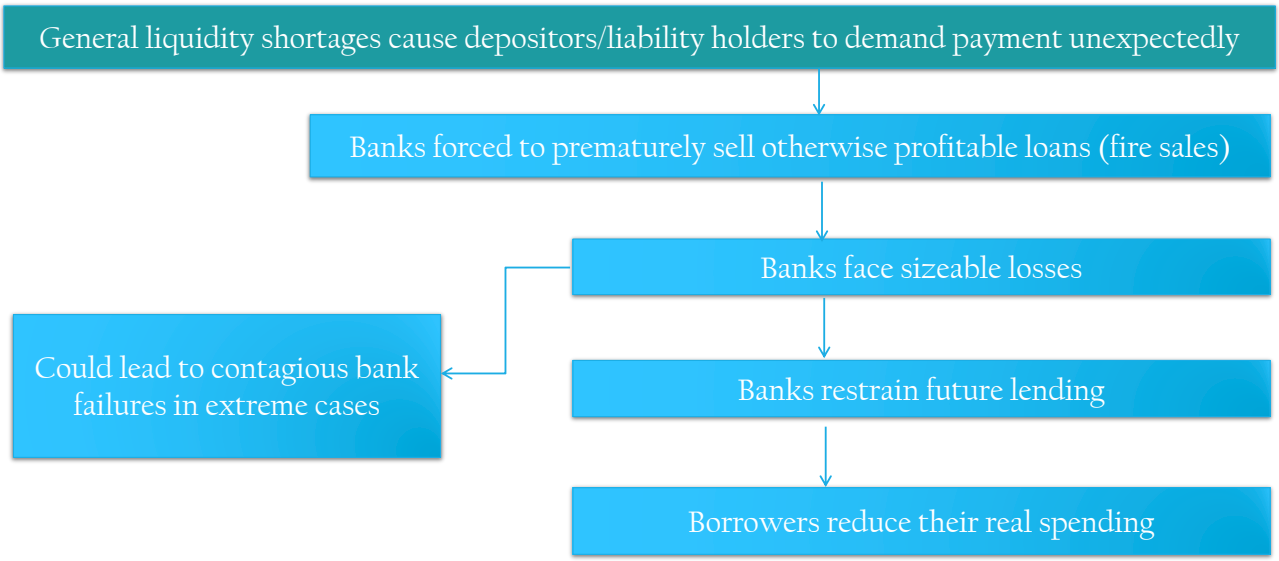
2.2.3. The Liquidity Channel

The liquidity channel is the third theoretical transmission channel, and it emphasizes the importance of a liquidity channel as a determinant of banks' ability to extend credit and in turn to affect real economic variables, either in influencing the strength of the traditional bank-lending channel or in creating additional transmission channels. *High leverage ratios*, *large maturity mismatches* in banks' balance sheets and *mark to market accounting* have been highlighted as critical elements in the propagation of liquidity shocks to bank lending and the real economy.

The literature distinguishes between two types of liquidity: *Funding liquidity* and *Market liquidity*. The presence of both funding and market liquidity can result in the anticipation of funding liquidity shortages inducing even healthy (i.e. liquidity ample) banks to refrain from lending.

Funding liquidity refers to the liability side of banks' balance sheets and can be defined as an institution's ability to get funding immediately, through asset sales or new borrowing, in order to meet payment obligations on debt at maturity. Banks finance illiquid assets with short-term debt. Aggregate liquidity shortages can emerge, such that if depositors (or liability holders more generally) unexpectedly demand payments (or are unwilling to roll over debt), banks can be forced to prematurely foreclose otherwise profitable loans. This can result in banks' facing sizeable losses that will restrain future lending and at the extreme can drive contagious bank failures (See Figure 5).

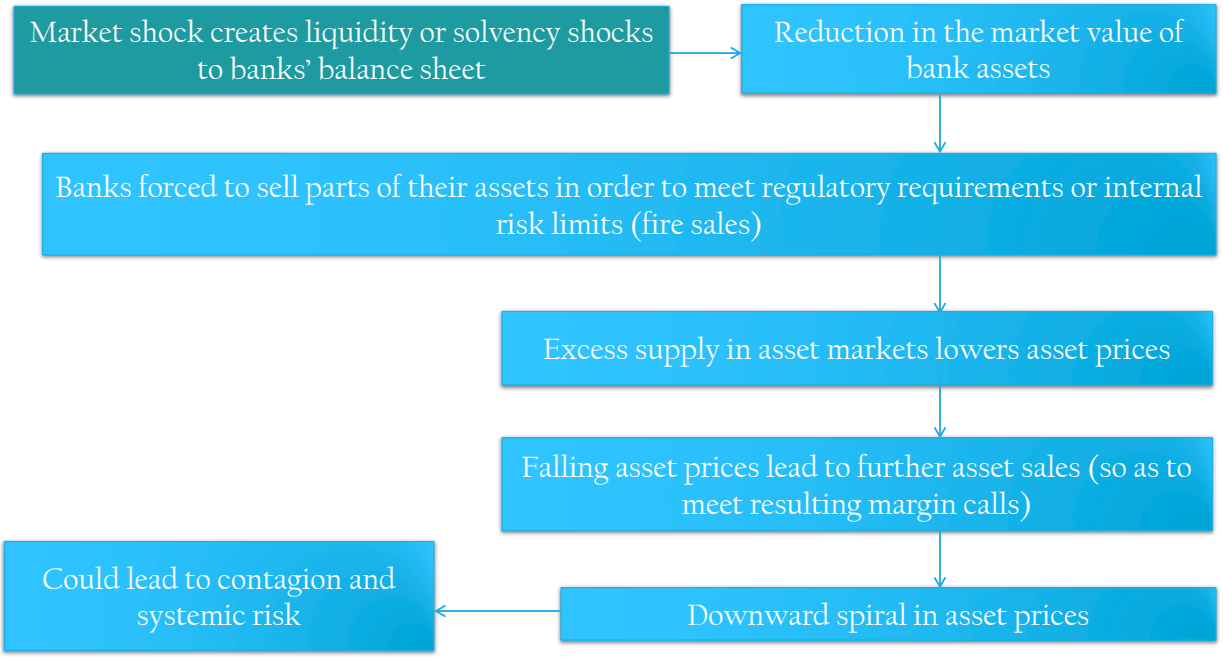
Figure 5: Liquidity Channel: Funding Liquidity



Source: Author's own representation based on BIS (2011a)

Market liquidity refers to the asset side of banks' balance sheets and defines the ease with which an asset can be traded. Mark-to-market accounting is accounting for the fair value of an asset or liability on the current market price or the price of similar assets. It often turns out to be a channel for contagion and systemic risk. It is heavily criticised because when current market conditions deteriorate, it affects the liquidity position and balance sheets of banks. There are strong links between distressed asset sales and banks' health. The basic mechanism is that given a liquidity or solvency shock, banks start to sell assets, which creates excess supply in asset markets and lowers asset prices. Falling asset prices in turn imply further asset sales (so as to meet resulting margin calls), which in turn means that a downward spiral in asset prices and deterioration in bank balance sheets (See Figure 6).

Figure 6: Liquidity Channel: Market Liquidity



Source: Author's own representation based on BIS (2011a)

CHAPTER 3: ECONOMIC RATIONALE FOR FINANCIAL REGULATION AND SUPERVISION

3.1. ARGUMENTS FOR AND AGAINST FINANCIAL REGULATION AND SUPERVISION

As noted in chapter 2, the financial system plays a key role in the economy by facilitating financial intermediation, which involves the mobilization and allocation of resources for productive investment. A stable financial system is also important for efficient functioning of the payments system, thereby accelerating the process of financial deepening between the financial and real sectors of the economy. Sometimes, however, when the financial system fails or malfunctions, it could pose severe problems for the whole economy. Some economists, on the one hand, argue that stricter financial regulation[2] and supervision[3] can prevent the occurrence of market failures (e.g. Diamond and Dybvig, 1983; Stiglitz, 1994) and promote economic development (e.g. White, 2005), while others advocated the notion of self-regulation of markets, i.e. allowing the invisible forces of demand and supply to regulate markets (e.g. Stigler, 1971).

Many believe that the occurrence of the recent financial crisis was premised on the latter view of 'light hand' regulation of markets, a view claimed to have been supported by the ex-Fed Chairman, Alan Greenspan, which led to the lowering of interest rates in U.S below sustainable levels. Those in favour of regulation and supervision present a "public interest" argument, while those against regulation present a "private interest" view. The Public-Interest view argues that the presence of asymmetric information in financial markets, which leads to market failures, justifies the role of government as the ultimate insurer of the financial system. Market failures disrupt capital formation through the financial intermediation role of banks and other financial institutions as mentioned earlier. Contagion theory teaches that the failure of a banking intermediary can spill over to other neighbouring banks thereby threatening the entire financial system (e.g. Diamond and Dvbvig, 1983). The failure of a bank can lead to a loss of capital far in excess of shareholders' investment. It inflicts a significant social and economic cost on society. These costs include: the fiscal costs of compensating depositors/investors (e.g. deposit insurance protection fund); the costs of recapitalizing failed banks; and output losses that occur due to overall disruption to the economy. The close up of factories and businesses, job losses created, collapse in external trade, among others, are examples of the spillover effects of a typical financial crisis. There is a view that the frequency and severity of financial crises are increasing, and as such, there is no case for leaving market forces to operate freely.

On the other hand, the private interest view of regulation admits the presence of market failures but contends that the government lacks the incentives and capabilities to ameliorate these market failures. Proponents of this view had viewed regulation as a product, like many other products, which are affected by supply and demand forces (Barth, Caprio and Levine, 2006). Moreover, orthodox economic theory teaches that market forces produce the optimal allocation of resources so that the workings of the market can be deemed efficient. The private interest view has been

[2] Regulation sets out the general rules under which officially authorised financial institutions and markets must operate.
[3] Supervision entails the monitoring and enforcement of compliance with the provisions of regulation.

described as the case of "regulatory capture[4]" or "political capture" (as the case may be) and in this case represents a situation where banking policies are primarily shaped by the private interests of the regulator, private bankers or politicians, rather than by the public interest. For example, the view believes that government regulates banks to facilitate the financing of government expenditures, to channel credit to politically attractive projects at the expense of economically efficient ones. Proponents of this view argue that even when all regulatory apparatuses are present, supervisory powers are limited and often politicized. Thus, they support the view of greater reliance on 'market discipline', 'information disclosure', a 'light hand' by the regulatory authorities, and a greater oversight on the regulatory process itself (Shleifer, 2005 cited in Barth *et al*, 2006). But recent crisis episodes prove this view to be inadequate. The depth and magnitude of the recent global crisis proved that the regulatory approach was lax and ineffective in anticipating shocks.

In essence, the shortcomings of regulation and supervision, notwithstanding, one can argue that because of the special role that financial institutions play in the economy and the economic and social costs to society of their eventual failure, it is obvious that leaving the forces of demand and supply to bear rule would have adverse implications on the economy and the living standards of the nation's citizens. It is on this note that the study expounds on the various reasons for financial system regulation in the rest of this chapter.

3.2. WHY REGULATE THE FINANCIAL SYSTEM?

A vast amount of economic and commercial activities is now being regulated and/or supervised, which shows the inability of competition and the price mechanism to produce socially desirable outcomes (Quinn, 2009). For example, food and drugs must be healthy and safe for consumers; the transport and aviation industries are now subject to stringent safety standards; there are now price controls on many products and services to prevent large firms from making huge monopoly profits. So, it is obvious that the provision of financial products must follow the same strict regulation. But an argument can be raised here, which is that financial institutions are special and hence demand special regulatory attention. While it is permissible for firms in some of these industries (e.g. clothes, food and travel) to go bust if they mismanage their affairs, it might not be socially or even politically acceptable for banks and other financial institutions (e.g. insurance firms, pension funds, and investment firms) to become insolvent. There are thus, several reasons for regulating the financial services sector:

3.2.1. The Importance of Financial Intermediation

Financial institutions, especially banks are essential to the efficient functioning of the economy. As mentioned earlier, they play distinct role in the financial intermediation process. Banks issue deposits, originate loans, and provide payment services. By facilitating transactions, mobilizing savings and allocating capital across time and space, the financial system contributes to economic performance. Financial institutions provide payment services and a variety of financial products and services that enable the corporate sector and households to cope with economic uncertainties by hedging, pooling, sharing and pricing risks. A stable, efficient financial sector thus, reduces the cost and risk of investment and of producing and trading in goods and services (Herring and

[4] The term 'regulatory capture' is associated with Nobel Laureate Economist, George Stigler. It is a theory that describes the process by which regulatory agencies that are supposed to be seeking the public interest rather decide to advance the 'commercial' or 'special' interests of the very industries they are charged with regulating.

Santomero, 1999). In view of these contributions to economic performance, maintaining a healthy financial sector through effective regulation and supervision should be of paramount interest to the central bank and other relevant stakeholders.

3.2.2. Protecting Consumers and Depositors[5]

A second fundamental rationale for financial regulation is the protection of consumers against the excessive pricing or opportunistic behavior by providers of financial services or participants in financial markets. According to Mathews and Thompson (2008), consumers lack market power and are prone to exploitation from the monopolistic behavior of banks. Banks are somewhat able to exploit the information they have about their clients to exercise some monopolistic pricing of financial products. However, the more competitive financial markets are the lesser this degree of exploitation. For example, strong competition in the banking system can lead to a decline in interest margins. However, the point is that consumers of financial services, especially the unsophisticated ones, are unable to evaluate the quality of financial information or services that they contract. Under such circumstances, consumers are vulnerable to *adverse selection*, the likelihood that a customer will choose an incompetent or dishonest firm for investment or agent for execution of a transaction. They are also vulnerable to *moral hazard*, the possibility that firms or agents will place their own interests or those of another customer above those of the customer or even engage in fraud. In short, unsophisticated customers are prone to 'incompetence', 'negligence' and 'fraud' (Herring and Santomero, 1999). The strict enforcement of conduct of business rules with appropriate sanctions for wrong behavior can help deter financial institutions from exploiting asymmetric information against unsophisticated customers.

Apart from protecting consumers from the opportunistic behaviour of financial institutions, depositors that are uninformed and unable to monitor banks also require protection. There is a notion that uninsured depositors are likely to run rather than monitor (Herring and Santomero, 1999). Historically, for example, most bank failures in the US were caused by bank panics[6]. In fact, it was in response to the banking crisis of the Great Depression that the U.S established the Federal Deposit Insurance Corporation (FDIC) in 1933 to assist in providing deposit insurance against loss of owners of small deposits. Many countries over the years have established similar systems of explicit deposit insurance. The argument that uninsured depositors are likely to cause a bank run is also theoretically motivated. The most influential work in the area of preventing bank runs is the analysis by Diamond and Dybvig (1983). The model presupposes that, in the case of an undesirable equilibrium, a bank run can precipitate the failure of other supposedly solvent banks because the failure of one bank causes depositors to panic and rush to the bank to withdraw their deposits because they expect other banks to fail. To solve this problem, the model proposes the suspension of deposit convertibility (deposit freeze) and the provision by authorities of a deposit insurance scheme to act as a disincentive to participate in a bank run.

3.2.3. Enhancing Efficiency of the Financial System

Apart from protecting consumers from monopolistic pricing, financial regulation also aims at harnessing market forces to enhance the efficiency of the allocation within the financial sector and

[5] A detailed discussion on deposit insurance and consumer protection can be found in section 6.3 and 6.4 respectively.
[6] See Mathews and Thompson (2008:189-190) for examples.

between the financial sector and the rest of the economy. In the U.S, competition policy and anti-trust enforcement are the key tools for enhancing the efficiency of the financial system. The main emphasis here is to minimize the monopolistic tendencies of banks and the barriers to entry into the financial services industry. One of the characteristics of an efficient banking system is one, which provides quality service to customers at competitive prices. An efficient financial system is also characterized by a reliable payments system, high liquidity and low transaction costs. The purpose of regulation is thus, to promote efficiency and competition in the financial system. Efficiency and competition are closely intertwined. An efficient financial system is able to utilize or allocate its investors' resources prudently if it will continue to attract their patronage. Without such competition, individual banks might want to gain higher prices for their products/services or collude with other banks (Spong, 2000). Some firms may want to take undue advantage of the relative ignorance of customers to boost profits. The purpose of regulation is thus, to use appropriate conduct of business rules, disclosure standards and conflicts of interest rules to guard against unwholesome practices and correct perverse incentives among firms. The efficient operation of the financial markets depends critically on confidence that financial markets and institutions operate according to the rules and procedures that are fair, transparent and place customers' interest first. An efficient financial system will stimulate competition, which also encourages innovation amongst financial institutions, which leads to the development of new and better financial services for customers.

3.2.4. Keeping up with the Pace of Financial Innovation

At the root of financial instability is the drive towards financial innovation by financial institutions and investors. As financial markets develop and expand globally and as new products and instruments evolve daily in line with changes in technology and the globalization of financial services, there have been significant concerns over the ability of regulators and supervisors to keep up with the complexity of products and markets. Banks seek to exploit profitable opportunities by innovating new market instruments and products that would generate substantial returns, yet are highly risky. Regulation and supervision have had to adjust accordingly. The analysis of risk, in particular, and the amount of capital and liquidity necessary to match this new understanding of risk, had developed significantly. For example, the recent global financial crisis, which was preceded by the adoption of new business models based on wholesale (non-stable) funding, derivatives trading and securitization of assets[7] elicited appropriate response by regulators and supervisors. The Basel Committee on Banking Supervision (BCBS) recently made changes to the Basel II framework, which was deemed to be pro-cyclical, and micro-prudential focused. The new regulatory framework is now termed the Basel III. Basel III strengthens bank capital requirements and introduced new regulatory requirements on bank liquidity and bank leverage[8].

In a world of increasing financial innovation, it is challenging for regulation and supervision to effectively prevent the fragility associated with a liberalized (market) system. Financial liberalization often leads to optimism and euphoria. Under such environment, risks are

[7] This practice is common today in developed financial centres and much less in developing countries where the classic form of commercial banking still prevails. In Nigeria, however, banks have since 2001 adopted the universal banking framework, which allows banking institutions to own other non-bank intermediaries like insurance companies, pension funds, and investment banking subsidiaries. This arrangement created huge transfer and interconnection of risks across these subsidiaries, especially in the capital market segment, and this partly accounted for the 2009-banking crisis in Nigeria.

[8] See Bank for International Settlements (2010) for more on Basel II enhancements (or Basel III).

downplayed and incorrectly assessed. Limits on credit expansion or concentration may not be easily enforceable. Notwithstanding its misfortunes, financial innovation matters for economic growth and allocation of capital. Because of this, it is somewhat difficult and costly to regulate financial innovation (Engelen *et al*, 2009). If financial innovation cannot be stopped, it can be made less attractive through various measures such as: *product testing*[9] – i.e. investigating the suitability of financial instruments or products and how they will be used; and *disclosure rules*[10] - improving transparency and information exchange in the market. These measures will perhaps assist regulators, investors and other market participants in assessing the risk profile of institutions and their exposures.

3.2.5. Guarding Against Systemic Risk and Contagion

The systemic risk rationale for prudential regulation and supervision of banks begins with the understanding that banks are *highly leveraged* institutions (with an equity-to-asset ratio that is lower than other financial and non-financial firms) and hold portfolios of illiquid assets that are difficult to value. Banks transform short-term and liquid demand and savings deposits into the longer-term, risky, and illiquid claims on borrowers. Shocks occur in a financial system where there is a breakdown in this maturity transformation upon which banks depend on for their profitability. Such shocks that originate from financial institutions' inability to redeem at short notice the deposits that fund longer-term illiquid loans can give rise to instability in the financial system. A systemic risk is thus, created where the risk of a sudden, unanticipated event in the financial system disrupts the efficient allocation of resources and thus, frustrates economic activity. According to a publication by the IMF, FSB and BIS (2009), systemic risk can be defined as "the risk of disruption to the provision of financial services (such as credit, payments and insurance services) that arises through the impairment of all or parts of the financial system, and has the potential to create a material adverse effect on the real economy". Macro-prudential policies are aimed at limiting the risk of such disruptions to the provision of financial services to the real economy.

The Bank for International Settlements (BIS) classified systemic risk into two dimensions: the 'cross-sectional' dimension (or micro-systemic dimension) of systemic risk; and the 'time' dimension (or the macro-systemic dimension). The cross-sectional dimension refers to the disruptions that arise from the effect of the failure or weakness of an *individual financial institution* on other financial institutions, which potentially disrupts the flow of financial services to the economy at large. According to Nier (2011), this kind of disruption can occur through *four channels of contagion*: direct exposures and contagion losses at other financial institutions; reliance of other financial institutions on the continued provision of financial services – such as credit and payment services – by the distressed institution; fire-sales of assets by the distressed institution that cause mark-to-market losses at other institutions; and informational contagion that sparks off a loss of confidence in other institutions. Addressing the cross-sectional dimension of systemic risk calls for the calibration of prudential tools with respect to the systemic significance of individual institutions

[9] According to the FSA's Turner Report (FSA, 2009) for the UK banks, product regulation is not required because well-managed firms will not develop products which are excessively risky, and because well informed customers will only choose products which serve their needs.
[10] Kodres and Narain (2009) suggest that models and valuation techniques used by banks should be disclosed to allow investors better judge the risks of what they are contracting.

vis-à-vis their contribution to overall risk. For instance, those institutions that pose a greater amount of systemic risk would be subject to tighter standards (Clement, 2010).

The time dimension of systemic risk, on the other hand, refers to disruptions of financial services that arise from the aggregate weakness of the financial sector and its effect on the real economy. This kind of disruption arises when risk is distributed within the financial system at once. It occurs because financial institutions are faced with common exposures or correlated risks, e.g. correlated credit risk, common exposure to market risks, including changes to stock market prices, exchange rates, and common exposure to the dry up of liquidity in funding markets. Since there are correlations or interconnections across institutions, crystallisation of these risks puts pressure on all or a large proportion of providers of financial services to the economy (Nier, 2011). The time dimension of systemic risk is also called the "pro-cyclicality[11]" of the financial system. Addressing pro-cyclicality calls for a prudential framework that induces the build-up of cushions in good times so that they could be drawn down in bad times (i.e. countercyclical capital buffers), thereby acting as stabilisers (Clement, 2010).

3.2.6. Mitigating Externalities from Financial System Failure

When financial institutions fail and markets dry up, they cannot perform their essential functions of channeling funds to those offering the most productive investment opportunities. Some firms may lose access to credit. Investment spending may suffer in quality and quantity. If the damage affects the payments system, the shock may also dampen consumption directly. The fear of such outcomes is what motivates policy makers to act. Moreover, there is a significant divergence between the private marginal costs and the social marginal costs of financial system failure. While the private marginal costs of failure (e.g. destroyed shareholder value, lost jobs and damaged reputations) are borne by the shareholders and the employees of the company, the potential external (social marginal) costs far outstrip these private costs in magnitude[12]. In this light therefore, it can be argued that the failure of an institution can lead to a loss of capital far in excess of shareholders' investment and inflicts a significant social and economic cost on society[13]. These costs include: the fiscal costs of compensating depositors/investors (e.g. deposit insurance protection fund); costs of recapitalising failed banks; and output losses that occur due to overall disruption to the economy. For example, the close-up of factories and businesses, job losses created, collapse in external trade, among others, are all spillover effects of a typical financial crisis. In fact, the fiscal costs of banking crises and other costs associated with crisis management over the years, according to a recent crises database hover between 13.3 and 51.1 per cent of GDP, with output losses averaging about 20 per cent of GDP during the first four years of the crisis (Laeven and Valencia, 2008). Thus, unregulated private actions can pose substantial costs to the real economy in many respects.

[11] Pro-cyclicality is the tendency for some regulatory and business practices to magnify the business cycle (Kodres and Narain, 2009).
[12] For instance, managers and shareholders of a failed institution do not have adequate incentives to take into account the contagion losses to other institutions and the real economy.
[13] The 'domino-effect' is the phenomenon used to describe the spreading of risks among interconnected entities in the financial system and the subsequent externalities to the society (e.g. Brunnermeier, et.al, 2009).

3.2.7. Financial Institutions' Access to the Public Safety Net

Commercial banks have access to the central bank's discount window when they face temporary liquidity constraints or the lender of last resort (LOLR) facilities when they are unable to access funds from the interbank market. Currently, investment banks and insurance firms (in the U.S for example) have access to the public safety net. Thus, it is imperative for central banks to monitor and supervise how these institutions deploy such funds. As stated earlier; to eliminate bank runs and insulate the financial system from adverse shocks, most national governments have instituted deposit insurance schemes. Although, the public safety net has been successful at protecting depositors and preventing bank panics, it also has serious drawbacks. With a safety net depositors know that they will not suffer losses if a bank fails, and therefore, do not have incentives to monitor the bank when they suspect that the bank is taking on too much risk. Consequently, banks with government safety net have the incentive to take on greater risks, with taxpayers paying the bill if the bank subsequently goes under.

Another similar problem with the public safety net is the 'too important to fail' and the 'too many to fail' syndromes. As the failure of a very large bank makes it more likely that a major financial disruption will occur, bank regulators are naturally reluctant to allow a systemically important bank to fail and cause losses to its depositors. One problem with this policy is that it increases moral hazard incentives for big banks. For example, an individually systemic institution can count on public sector support when it fails, thereby distorting incentives for private risk management and further reducing the force of market discipline[14] (too-important-to fail). In addition, financial sector exposures to institutions that are labeled 'too important to fail' are likely to grow substantially large as financial institutions care less about their exposure to an entity that is expected to be supported. Similarly, if banks have an expectation that in the event of an aggregate weakness of the financial system (macro-systemic risk), they can gain public sector support, it further distorts incentives and lead institutions to increase their exposure to the aggregate shock – 'too many to fail' (Acharya and Yorulmazer, 2007).

3.3. KINDS OF REGULATION

Following our earlier argument that government interference in the market place is required in order to curtail risks in the financial system, what kinds of regulation or market interference are justified? There are two broad kinds of regulation: Prudential Regulation and Supervision and Conduct of Business Regulation.

3.3.1. Prudential Regulation and Supervision

This refers to the institutional mechanisms that are designed to safeguard the financial sector from systemic risk. They are usually directed at the safety and soundness of the individual banks (Micro-prudential regulation) and of the financial system as a whole (Macro-prudential regulation). Before now, the regulatory approach assumed that by safeguarding individual institutions, the entire financial system will be safe. But this approach fails to work in practice, as many banks and other highly geared financial institutions tend to behave in a manner that jointly undermines the financial system. For example, in times when risk is perceived to be high, selling an asset could be

[14] Even uninsured depositors (whose deposits are far in excess of the government's deposit insurance limit) are less likely to monitor the bank and enforce market discipline because they believe the government will intervene in the event of failure, further strengthening the 'too important to fail' syndrome.

seen as a prudent response by an individual bank. But if many banks follow this approach, asset prices will collapse, and such generalised downswings in asset prices may lead to huge volatility in asset markets. Prudential regulation of banks is therefore necessary to stem systemic risks by ensuring that banks hold sufficient capital at all times. The approach, however, should be the harmonisation of both micro and macro-prudential measures to ensure the stability of the entire financial system.

3.3.2. Conduct of Business Regulation

This refers to basic legal rules that guide financial service providers in the conduct of their day-to-day dealings with customers, the public and other stakeholders. The objectives are to preserve orderly markets and to avoid exploitation of customers. This kind of regulation would involve the regulation of selling approaches and client transactions; regulations against financial crime, terrorist financing, money laundering as well as strict rules and penalties that are used to enforce compliance by financial service providers. Conduct of business regulation is essential because savings and money assets represent a store of value for consumers and as such cannot be compromised by the opportunistic behaviour of financial institutions. As argued earlier, consumers need to be confident to a reasonable degree about the quality and safety of financial products that are on offer before they can entrust their money with financial institutions. For example, a few years ago in UK, there was considerable evidence that consumers were increasingly becoming reluctant to commit to long-term contracts, especially those involving life assurance and pension products. This was attributed to a series of 'scandals and hazardous selling practices' undertaken by some financial institutions. In the build-up to the financial crisis, the hard-earned pension contributions of individuals were repackaged and mis-sold among financial institutions in what could be described as an "unscrupulous behaviour" that damaged consumer confidence in the financial services industry (Llewellyn, 1999). In the light of these circumstances, conduct of business regulation becomes inevitably necessary to restore and maintain confidence in the financial system.

CHAPTER 4: RISK TYPOLOGY, THE BASEL CAPITAL REGULATION AND THE GLOBAL FINANCIAL CRISIS

This chapter examines the various types of risks facing banks and the role of supervisors in dealing with them. It also focuses on the evolution of the Basel regulatory models used to mitigate these risks identified, particularly the Basel II and III framework. It also examines the causes of the global financial crisis and the role that the Basel II capital regulations played in the build-up to the crisis as well as the enhancements made in Basel III.

4.1. WHAT KINDS OF RISK SHOULD A SUPERVISOR CONSIDER?

The business of banking and financial intermediation is associated with so many classes of risk, which a supervisor should be conversant with. These risks are inherent in the financial system and include: credit risk, liquidity and funding risk, market risk (including interest rate risk, currency/exchange rate risk, flight risk), operational risk (including process risk, people risk, systems risk, strategic risk, and external environment risk), governance and reputational risk, legal and regulatory risk, money laundering and terrorist financing risk, among others. This section does not exhaust all the classes of risk that financial institutions are exposed to but attempts to examine the common risks that make banks and other financial institutions vulnerable to shocks or losses in asset values.

4.1.1. Credit Risk

Lending activities require banks to make judgments related to the credit worthiness of borrowers. These judgments do not always prove to be accurate, and the creditworthiness of a borrower may decline over time due to various factors. In this light, credit risk refers to the possibility that a counter party, usually a borrower, will be unable to repay a loan when it falls due, or be unable to pay interest on a loan on the due date. Credit risks can come in the form of *credit risk concentration* in a particular sector or business (such as the leverage in the sub-prime mortgage market, which ignited the recent crisis) or *connected lending risk*, linking several closely related parties. The case of the latter has to do with the extension of credit to legally separate, but corporately connected companies or individuals. In these, or in similar circumstances, the connection can lead to preferential treatment in lending and greater risk of loan losses. Credit risk is usually measured by loan quality indicators, such as loan loss reserves or provisions (LLR), actual loan losses (Impaired loans) and non-performing loans as a percentage of total loan portfolio (NPLs). Other measures of credit risk include growth rate of assets and loan growth.

4.1.2. Liquidity and Funding Risks

All banks face the risk of maturity transformation of assets and liabilities. They borrow short-term funds (liquid liabilities) to finance long-term (illiquid) loans so that there is a disconnection between their short-term funding and their expected future cash flows. Banks are therefore exposed to 'funding liquidity' risk (Brunnermeier *et al*, 2009) and this affects their profitability and long-run survival. For example, if banks face unexpected withdrawal of deposits on a large scale and are unable to control the resulting cash shortage by borrowing from money markets, they may be forced into early liquidation of their assets (i.e. fire sale) to realise cash, thus lowering their book value. The situation becomes worse if contagion occurs as discussed earlier, the entire banking

system will become vulnerable to destructive bank runs (Diamond and Dyvbig, 1983) and confidence in the system will disappear quickly as the entire credit markets cease to function. The recent financial crisis gives an example of funding liquidity problems in which case most banks, especially large ones (that depended mainly on purchased liabilities from the wholesale market) were faced with the problem of low market liquidity, which translated into depressing asset prices and shrinking bank balance sheets.

4.1.3. Market Risk

This is the risk of an unexpected change in the book value of an asset because of a change in its market value. It refers to the possibility of loss over a given period of time related to uncertain movements or fluctuations in market risk variables, such as interest rates, exchange rates, commodity prices (e.g. oil prices), equity prices, and so on. Changes in these variables tend to affect the economic value of assets, liabilities and off-balance sheet instruments (Mathews and Thompson, 2008). For example, the 2007 sub-prime mortgage crisis led to the collapse of many of the world's stock markets and these led to declining book values for financial institutions with huge exposures to the capital market. Adverse movements or volatility in interest rates or the mismatching in the timing of interest on assets and liabilities could pose serious *interest rate risk*. In addition, the currency mismatches associated with foreign borrowing of banks may leave banks vulnerable to currency depreciation or devaluation that may frustrate repayment of foreign debts *(currency risk)*. Financial institutions may also face *flight risk* in the event that foreign capital invested in the institution is recalled abruptly during a recession or when the bank is in dire need of funds. Banks are, however, able to hedge some of these risks by entering into derivatives contracts (e.g. options, futures and currency swaps).

4.1.4. Operational Risk

The Bank for International Settlements (1997) defined operational risk as "*the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events*". It arises from deficiencies in corporate governance, internal systems, controls and risk management. In line with the BIS definition, Mathews and Thompson (2008) categorised operational risk by various sources: *process risk* (risk that arises from the possibility of loss due to transaction errors); *people risk* (fraud[15], collusion, unauthorised use of information, competency, health and safety, and so on); *systems risk* (data corruption, programming errors or systems failure, security breach, and so on); *business strategy risk*[16](change management, project management, political risk), and *external environment risk* (financial reporting, money laundering, tax, litigation, natural disaster, armed robbery, identity

[15] A good example of fraud or mismanagement is the failure of Barings Bank in 1995, the oldest merchant bank in London until its collapse. The institution's failure arose directly from the inability of management to fully understand the dealing activities of its Singapore derivatives subsidiary, or to prevent its star trader from controlling both its trading operations and its financial controls on these operations (Quinn, 2009). The employee, Nick Leeson was alleged to have lost £827 million (about $1.3 billion) due to speculative investing, primarily in futures contracts at the bank's Singapore office.
[16] As the name implies, business strategy risk or 'strategic risk' is the risk associated with the institution's business model and business strategy. For example, a financial institution that is introducing a new business line with which it has had no prior experience or is entering a market segment in which it previously was not represented may face high strategic (or change management) risk because the new business may not be accepted by the market or the institution may have difficulty penetrating the new segment. In this circumstance, the institution may lose its investment in the new business and risk damaging its reputation (Randle, 2009).

theft, terrorist threat, strike risk). Some of the most important dimensions of operational risks are explained below.

4.1.5. Governance and Reputational Risks

Reputational risk may occur where a financial institution mismanages its affairs to the extent where its clientele base is seriously eroded and its ability to participate in financial markets is seriously compromised. This is usually the case of excessive risk taking by the company's management at the expense of investors/depositors or rivalry/competition at the board level. The failure of the board to govern the institution properly could also arise from lack of skills or lack of probity (Randle, 2009). The failure of the board to plot a clear future direction for the company, balance the interests of shareholders and management or oversee its operations sensibly could result in huge financial losses to investors and depositors. The Midland Bank in the UK, once the world's largest commercial bank, made strategic errors in the 1970s and 1980s and saw its business damaged to the point where it was acquired relatively cheap by HSBC. The failure in 2008 of Lehman Brothers, one of the world's largest and reputable investment banking groups presents another example.

4.1.6. Legal and Regulatory Risks

This is the risk to the financial institution from the legal system in which it operates. Financial institutions, like other industries, operate in a world that is subject to a vast array of legal requirements, not only from its own financial regulations, but also from taxation, labour, company, consumer protection, intellectual property and competition laws to mention a few. In many cases, failure to comply with these laws invokes strict penalties – ranging from financial penalties (e.g. fines) on the one hand, to withdrawal of operating licence (loss of authorization) in the extreme case. Legal risk is "the risk that an institution incurs a loss through its failure to be aware of and comply with all the legal requirements to which it is subject" (Randle, 2009:9). Examples of this class of risk in the financial system are numerous and can arise on both prudential and conduct of business grounds. Legal risk can also be involved where a financial institution fails to devote sufficient attention to the terms and conditions (i.e. the legal documentation) of a financial contract. This can result in failure to obtain value from the asset involved, or damages arising from legal action by a counter party. It can also arise when a financial institution fails to understand the legal regime in another country or where the legal system in that country is itself insufficient or favours local institutions and customers.

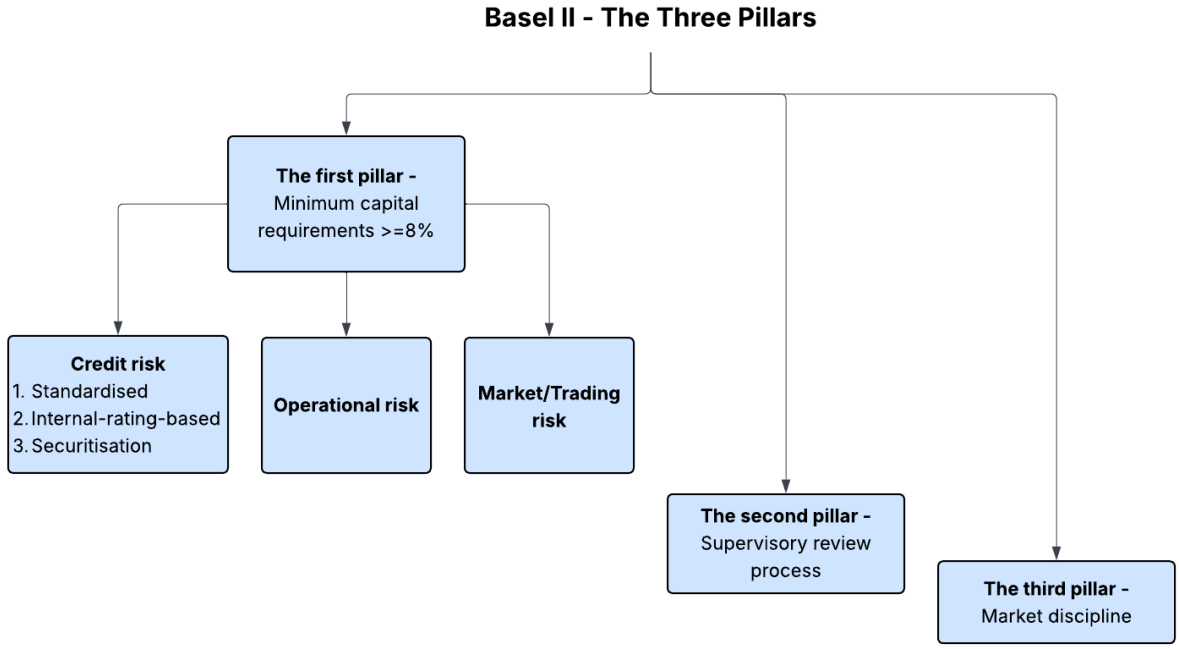
4.1.7. Money Laundering and Terrorist Financing Risks

Money laundering and terrorist financing pose negative effects on capital allocation and on the economy as they are closely knitted to the underlying criminal activities. Financial institutions whose platforms are used for any of these purposes face the risk of being labelled as aiding and abetting the associated crime. Where funds from a particular criminal activity are processed through a particular financial institution, the latter could be construed as being in active complicity with criminals and may be considered part of the criminal network. Evidence of complicity could have a damaging effect on the attitude of other financial intermediaries, regulatory authorities and customers of such institutions (CBN, 2010).

4.2. RISK MITIGATION UNDER BASEL II ACCORD

The risks inherent in banking must be recognised, monitored and controlled. Although managing risks is the responsibility of the Board of Directors of financial institutions, there is also a key role for prudential regulation and supervision in controlling these risks. Supervisors usually require and enforce capital adequacy standards, loan loss reserves, asset diversification, liquidity risk management and internal controls. The capital adequacy requirement is an essential ingredient of the Basel II Accord developed by the Basel Committee on Banking Supervision (BCBS) though with recent revisions on capital buffers, leverage and liquidity standards (known as Basel III – see BCBS, 2010c and section 4.5). This section provides an overview of the regulatory risk models available for mitigating the risks identified earlier and how to manage crisis situations in the event that they occur. Prudential regulation and supervision is hinged essentially in the Basel II Accord framework which comprises three pillars (see Figure 7).

Figure 7: The Basel II Approach



Source: Adapted from: Mathews and Thompson (2008)

4.2.1. Pillar I: (Capital Adequacy Requirement)

Pillar I specifies capital requirements by weighting assets by their risk. Banking supervisors must set prudent and appropriate minimum capital adequacy requirements for all banks. Such requirements should reflect the risks that the banks undertake, and must define the components of capital, bearing in mind their ability to absorb losses. This pillar holds that banks' Tier 1 capital (economic capital[17] or core capital – permanent shareholders' equity, disclosed reserves and retained earnings) must be 4% of risk weighted assets (RWAs), while the regulatory capital[18] (Tier

[17] Economic capital is calculated based on the expected losses to shareholders (i.e. the private marginal costs discussed earlier).
[18] Regulatory capital is calculated as a charge (not a 'reserve' or 'buffer') on bank risk taking. It represents an approach aimed at approximating the social costs of bank risk-taking and reducing negative externalities.

I + II[19]) must be at least 8% of RWAs. Economic capital or equity capital serves several purposes: it provides a permanent source of revenue for the shareholders and funding for the bank; it is available to bear risk and absorb losses[20]; it provides a base for further growth; and it gives shareholders reason to ensure that the bank is managed in a safe and sound manner. Thus, this pillar helps to guard against key banking risks: credit, operational and market risks. Minimum capital adequacy ratios (CAR) under pillar I are necessary to reduce the risk of loss to depositors, creditors and other stake holders of the bank and to help supervisors pursue the overall stability of the banking industry (BCBS, 1997). Supervisors must set prudent and suitable minimum capital adequacy requirements and encourage banks to hold capital in excess of the minimum. Supervisors should also demand higher than the minimum capital ratios because of the kind of risks that banks are exposed to, especially if there are uncertainties regarding the asset quality, risk concentrations or other adverse conditions of uncertainties regarding the asset quality. If a bank's ratio falls below the minimum, banking supervisors should ensure that they take pragmatic steps to restore the minimum in due time.

4.2.2. Pillar II: (Supervisory Review Process)

Pillar 2 solidifies risk management and bank supervision systems. It consists of on-site and off-site oversight of the company's risk management, the overall quality of management and corporate governance. The supervisory pillar addresses risks where additional capital is not necessarily the appropriate protection against loss. For example, models of asset and liability management may tackle liquidity risk so that unexpected deficiencies of cash can be avoided. Operational risk may be offset by additional capital, but adequate systems and controls can only be judged by specially designed examination on the spot. For example, money-laundering controls are tested not only by manuals and written instructions, but also by evidence that these controls are actually used in practice by staff on the ground.

The supervisory process in general involves *core principles*, *models* and *approaches or methods*. The Basel Core Principles (BCBS, 2006)[21] specifies 25 principles that are needed for a supervisory system to be effective. Accordingly, a sound risk management framework must have clear objectives and specify formal supervisory powers, cooperation, supervisory approach, techniques and reporting standards. The framework should also be independent and transparent. It must specify permissible institutions and activities that are licensed and the licensing criteria. Supervisors must be satisfied that banks have in place a comprehensive risk management process and must ensure the quality of oversight provided by the board of directors and senior management meet required standards. In addition, supervisors must be satisfied with the adequacy of policies and limits for all activities that present significant risks (as identified in section 4.1). The adequacy of accounting and disclosure as well as the quality of risk measurement and monitoring systems should also be checked. Finally, supervisors must be satisfied with the adequacy of internal controls to prevent fraud, abuse of financial services or unauthorised activities on the part of employees.

[19] Tier II capital is supplementary capital, which includes other forms of reserves or hybrid capital instruments, e.g. convertible bonds

[20] However, losses cannot be charged directly to this fund but must be taken through the profit and loss account.

[21] The 2006 Core Principles Publication by the Basel Committee should be consulted in addition to the 1997 Core Principles for Banking Supervision. The latter takes a look at specific practices to mitigate key banking risks by bank supervisors – including credit, market and operational risk management. Also note that the BCBS is currently conducting a review of the Core Principles for Banking Supervision to reflect the lessons of the global crisis.

Risk assessment under pillar two usually involves the use of the CAMELS rating model: *Capital Adequacy*, *Assets Quality*, *Management Efficiency*, *Earnings*, *Liquidity*, *and Sensitivity to Market Risk*. Regulators use these measures in adjudging whether a bank is financially sound or not. If a bank's CAMELS rating is low, bank regulators can enforce regulations or take formal actions to alter the bank's behaviour to reduce moral hazard. In the extreme case, where the rating is sufficiently low, regulators can close a bank and withdraw its licence to operate. Section 6.2 explains the CAMELS rating in more detail.

4.2.3. Pillar III: (Disclosure and Transparency)

For market forces to work effectively, thereby fostering a stable financial system, market participants need access to correct and timely information. Disclosure is therefore a complement to supervision. Pillar III requires adequate disclosure and transparency by banks to improve the quality of information available to depositors, regulators and market participants and enable all stakeholders monitor banks' conditions. It requires disclosure of a substantial volume of information by each institution, including information regarding their activities and financial position. The information provided by banks should be comprehensive and not misleading. Disclosure requirements are important because they assist market participants in their own evaluation or assessment of each institution's risk profile and their capacity to manage identified risks.

Before proceeding to discuss the role Basel II played in the recent global financial crisis, it is important to review some of the root causes of the global financial crisis to aid understanding of the developments.

4.3. THE MICRO- AND MACRO-ECONOMIC CAUSES OF THE GLOBAL FINANCIAL CRISIS

Many economists and analysts have described the 2007/08 global financial crisis as the worst economic meltdown since the great depression of the 1930s. The collapse of the financial system and the credit markets, the close up of factories, companies, the loss of output, jobs and the decline in terms of trade all signalled gloom and generated worries among governments and policy makers who had exhausted all options and had implemented successive fiscal packages in a bid to stem the awful situation. For the first time, the world economies witnessed stagnation or minimal growth since more than seven decades. Many of the world's developed countries were hit by the financial meltdown and these also gave rise to negative feedback effects on developing countries as world industrial production and merchandise exports fell drastically and stock markets experienced prolonged downturns.

At the root of the recent financial crisis was the "*search for yield*" by financial institutions and investors. The increasing integration of financial markets and the apparent relative stability of advanced economies, for example, the U.S and the U.K (in the form of growing private sector employment, moderate inflation regimes, high savings ratio, stable exchange rates, low real and nominal interest rates, and so on) led investors and financial institutions to begin to search for profitable investment opportunities. This resulted in *over optimism, speculation and leverage*. The U.S housing market became the toast of investors. Banks were extending credit massively to borrowers in the mortgage market (especially in sub-prime loans) with the hope that they will reap handsome

returns from future rise in house prices, which already had begun to escalate at the time. On the other hand, individuals took advantage of this leverage and borrowed money from banks to speculate on asset prices. Because of the expectation that house prices will continue to rise, coupled with the need to gain market share and competitive position, banks started loosening their credit standards, and as such did not monitor the credit worthiness of borrowers - a task that in fact had been outsourced to credit rating agencies (CRAs). When the U.S house prices dropped considerably around 15-20 per cent off its peak in the summer of 2007, borrowers started to default in large numbers. This implied that *the crash in house prices* weakened the financial condition of many consumers whose asset values and wealth had declined. The resulting loss of collateral value led to a rise in mortgage delinquencies and home foreclosures by lenders. As house prices fell, lenders had to absorb an unusually high proportion of the losses. This led to the *deterioration of banks' balance sheets* and dry up of liquidity in the system.

The macroeconomic origins of the crisis can be traced to the *easy monetary policy* being conducted by the U.S Federal Reserve at the time. Interest rates were kept low for too long and this encouraged excessive leverage among banks. Also, there were *huge fiscal imbalances* in many western countries that funded their current account and budgetary deficits by capital transfers from South East Asian countries via international capital markets. China, Japan and Germany were among major lenders to borrowing countries like U.S, U.K and Spain who used such funds for speculative purposes. Another major aggravating factor was *financial Innovation*- the widespread practice of the securitization. Commercial banks changed their business models in which they initiated loans to borrowers and subsequently packaged and sold these loans as securities to investors in search of higher yields. The development of complex financial products – Collateralized Debt Obligations (CDOs), Asset-Backed Securities (ABS), Mortgage-Backed Securities (MBS), Credit Default Swaps (CDS), among others, all led to the manufacture of coupon assets and unregulated credit creation. To make matters worse, credit rating agencies were rating many of these securities triple "A" and could not foresee the impending disaster.

Lax financial regulation, particularly in the U.S, has been adjudged by many as being responsible for the crisis. The creation of complex financial products (the securitization process) was not fully understood by the regulators. More so, the development of unregulated "non-bank" financial institutions known as "Shadow financial system" meant that the regulatory architecture was flawed. The implication was that financial innovation grew quickly and moribund the existing regulatory structures, as financial institutions looked for ways to circumvent procedures. Thus, traditional early warning models could not predict the crisis. Also, there was the *notion of self-regulation of markets* – the widespread belief that the market self-regulates and that the government can only make matters worse (a view held by Alan Greenspan, former chairman of the US Federal Reserve). Thus, increasing competition in the banking business pushed banks towards more risky activities. Banks also developed a *new funding structure* in which they became increasingly dependent on wholesale sources of funds rather than traditional deposits from customers. In some banks, they obtained no more than 20 per cent of their liabilities from customer deposits. When wholesale sources of funds dried up, they began to hoard liquid assets and stopped extending credit. Other factors which aggravated the crisis were *the fusion of banking and capital markets*; *technological revolution* which aided the internationalization of financial services; *contagion and connectedness* of institutions

and financial markets which made it easy for risks to be transferred among institutions and across countries. Lastly, banks, pension funds, and investors all over the world were "shallow-minded" and did not take the care to investigate how their money was used as everyone was carried away by the glamour of money making.

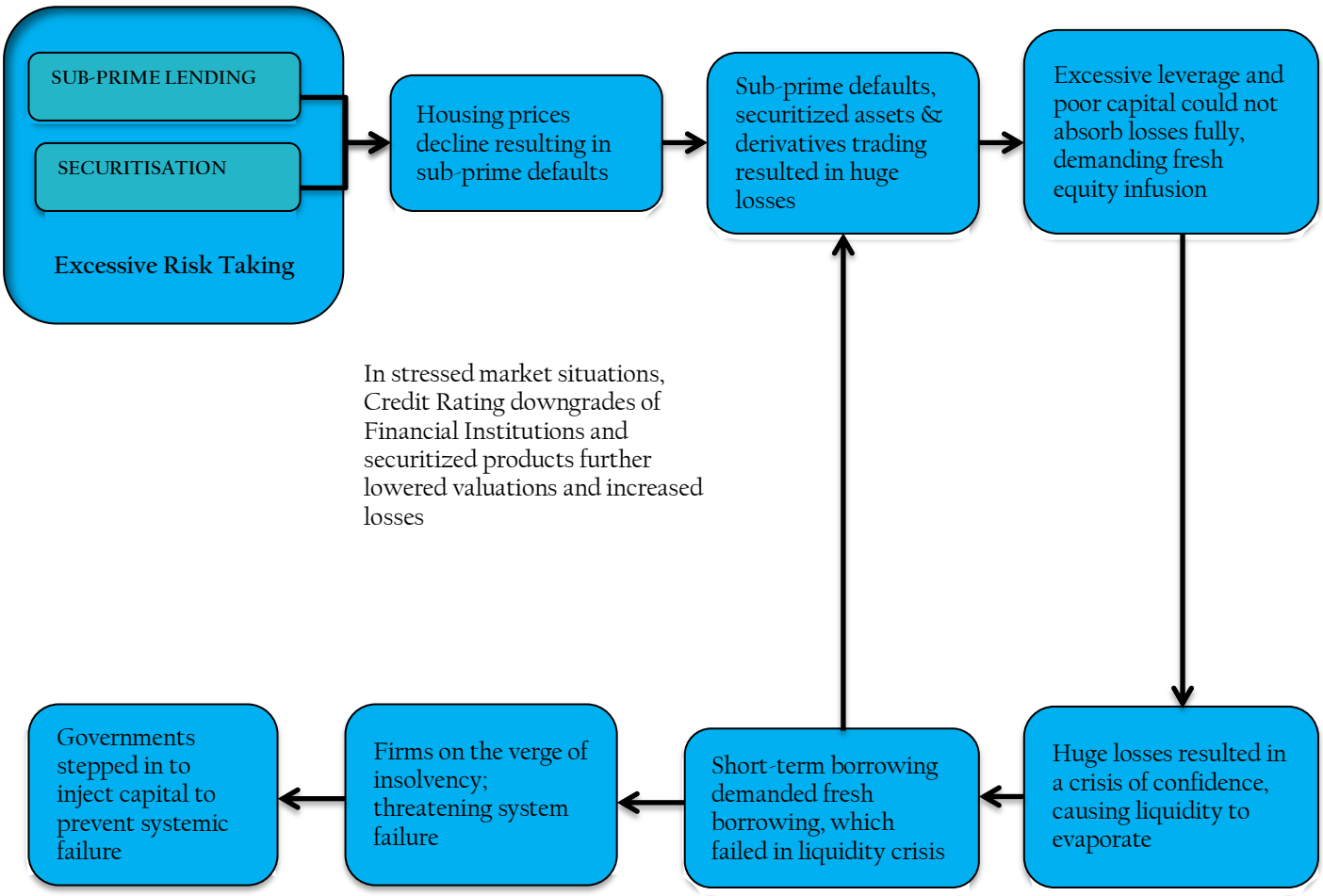
According to (Giovanoli, 2009), the sequence of events may be summarized, albeit in a simplified manner as follows:

- An *essentially domestic crisis* occurred within the sub-prime mortgage market in the United States against the backdrop of an expansive monetary policy, following exaggerated and imprudent lending to borrowers who did not meet normal criteria of creditworthiness;
- As a consequence of the *securitization* of these credits, they were resold en masse to banks and other financial intermediaries all over the world;
- *Credit default swaps* led to additional dissemination of the related credit risks;
- When the US sub-prime mortgage market eventually collapsed after the burst of the real estate bubble, the related assets became virtually worthless ('toxic assets');
- When it appeared that a number of major banking institutions and other financial intermediaries all over the world held large exposures of toxic assets, general mistrust among banks caused the *quasi-disappearance of the interbank money market*;
- Extensive governmental support of the financial sector (through guarantees of interbank loans, purchases, or swaps of toxic assets, creation of 'bad banks' to take over such assets, fresh capital, and takeovers of nearly defaulting banks) only partially restored confidence;
- The credit crunch resulting from the financial crisis eventually affected the larger economy, which fell into a deep recession;
- Governmental support packages to the larger economy, in addition to the support already granted to the financial sector, massively increased public deficits;
- The rapidly increasing indebtedness of some countries raised concerns about their ability to meet their financial obligations in the future (expressed through increased spreads for newly issued debt) and led to strains in international monetary relations.

4.4. THE ROLE PLAYED BY BASEL II IN THE GLOBAL FINANCIAL CRISIS

Economic analysts, policy makers and market operators have blamed the Basel II framework on bank capital adequacy as a major cause of the 2007/08 Global Financial Crisis, which was triggered by falling house prices in the sub-prime loans' sector in the US before spilling over to the global financial system (Cannata and Quagliariello, 2009). In actual fact, several issues related to the functioning of financial markets were closely examined, but the Basel II prudential regime was the first suspect to be accused: the adequacy of the capital levels in the banking system, and the role of rating agencies in financial regulation, the pro-cyclicality of minimum capital requirements, the fair-value assessment of banking assets were among the most debated issues. The existing international financial standards, despite their wide scope and sophistication, did not prevent the outbreak of the global crisis. In fact, what started out as a domestic financial crisis later turned out to be a global financial and economic crisis (Giovanoli, 2009).

Figure 8: The Crisis Cycle



Source: Rohit *et al* (2010) - Infosys White Paper (pp.2)

According to Rohit *et al* (2010), some very fundamental assumptions by financial institutions and regulators were proven wrong during the crisis. The business of sub-prime lending was based on the assumption that house prices would keep going up. This assumption proved wrong and it triggered a chain reaction that engulfed the global financial system. This 'crisis cycle' is illustrated in figure 8. There were some incentives present in the financial system that encouraged risk taking. Transferring of risk through securitisation; relying on credit ratings provided by credit rating agencies, which were paid for by the issuers; and compensation of top management based on absolute growth, revenue and profit rather than risk-adjusted profitability were just some of the reasons that encouraged excessive risk taking by banks. When sub-prime loan defaults started impacting on the balance sheets of financial institutions, it became a systemic problem. Quarterly losses to the tune of billions of dollars by major financial institutions resulted in a financial crisis of confidence that sucked out liquidity from the financial system. At this time, the weaknesses of the Basel II guidelines became very evident. Exposure to risky assets in the form of sub-prime loans, securitisation and derivatives resulted in excessive losses. The low quality and quantity of capital could not absorb these losses when systemic risk materialised. The banks' loss absorbing capacity was affected because of their excessive leverage and their short-term sources of funding made financial institutions gasping for capital when it was difficult to raise one.

In specific terms, the Basel II regulatory system has been criticised on the following grounds:

- The average level of capital required by Basel II is inadequate and this is one of the reasons for the recent collapse of many banks;
- Credit risk models in Basel II seek to align regulatory capital with economic capital. The key assumptions that banks' internal models for measuring risk exposures are superior than any other has been proved wrong. Benink and Kaufman (2008), among others, highlighted that a supervisory approach based on internal models may imply perverse incentives, which would induce banks to underestimate their exposure to risk.
- The interaction of Basel II with fair value accounting has caused remarkable losses in the portfolios of financial intermediaries. Actually, fair-value assessment has certainly played a major role during the financial crisis, pushing banks to raise new capital to cover losses and avoid possible defaults (Cannata and Quagliariello, 2009).
- Basel II allows too much discretion for supervisors (which promote regulatory capture). It also suffers from regulatory arbitrage – bankers circumvent unfavourable regulations due to loopholes in the regulatory system. For example, the Basel II framework provides incentives to intermediaries to set up off-balance sheet vehicles to reduce the capital charge against some types of risks, which led to banks holding large off-balance sheet exposures (Cannata and Quagliariello, 2009).
- Basel II is static and hence does not take into account the increasing pace of financial innovation. It also suffers from knowledge gaps - regulatory models are flawed with information gaps about risk and its distribution within the financial system;
- Basel II is also flawed on account of over-reliance on rating agencies. The assessment of credit risk is delegated to rating agencies, which are non-banking institutions and are subject to possible conflicts of interest. Rating agencies failed to warn about the Asian crisis of 1997-98 and the sub-prime mortgage crisis in 2007 (Quinn, 2009);
- Basel II is pro-cyclical and backward looking (e.g. leverage outgrows capital), hence it does not weather the storm in times of financial distress;
- It emphasises micro-prudential regulation (which is ameliorating individual bank risks) without a corresponding attention to the health of the entire financial system.

However, in spite of these accusations, some economic analysts still believed that Basel II had numerous advantages, including the increasing significance of operational risks after credit and market risks, the introduction of the internal rating system approach and increased transparency through market discipline and detailed financial reporting, which offered relevant, credible, comparable and comprehensible information (Zapodeanu and Gall-Raluca, 2009). Other advantages of Basel II include increasing competence of supervision authorities; equitable bank competition; and the creation of opportunities for the globalisation of financial services. Another merit of the Basel II framework is that it allows regulators and supervisors to engage in a dialogue with banks to improve their risk management practices.

Nevertheless, it later became obvious to the Banking Committee on Banking Supervision (BCBS) that the Basel II framework played down on the interconnections of risk categories, particularly liquidity and credit risks. In view these shortcomings, economists in recent times therefore suggested that, for regulation to be effective, there is a need to evolve a framework that is macro-prudential focused and counter-cyclical in approach to accommodate the dealings of an ever-innovative financial sector.

4.5. BASEL III: CHANGES TO CAPITAL AND LIQUIDITY AFTER THE CRISIS

Arising from the depth and severity of the recent global financial crisis and the failure of Basel II to contain the excessive leverage and liquidity risks arising from the financial sector, the Basel Committee on Banking Supervision (BCBS) developed a reform programme to address the lessons learnt from the crisis as well as strengthen the resilience of banks and the global financial system. This reform programme has been documented in *The Basel Committee's response to the financial crisis: Report to the G20* published by the BIS in October 2010 (BIS, 2010). The reforms are expected to strengthen both firm-specific (micro-prudential) and system-wide (macro-prudential) regulation and risk management systems. This section presents an overview of the major changes made to the Basel II framework, which was later labelled as Basel III. The central focus of the Basel III reforms is stronger capital and liquidity regulation (BIS, 2010, BCBS, 2010c).

4.5.1. Changes to Pillar I (Capital & Leverage)

A key source of bank fragility is the insufficient level of high quality capital to absorb losses arising from deteriorating asset values. Higher capital therefore means more loss-absorbing capacity. Basel III now introduces higher levels of capital from which credit losses and write-downs can be deducted. Common equity is the highest form of loss absorbing capital and Basel III will now require banks to hold 4.5 per cent of common equity (up from 2 per cent in Basel II) and 6 per cent of Tier I capital (up from 4 per cent in Basel II) of risk-weighted assets (RWA). Basel III also introduces additional capital buffers as part of efforts to address the procyclicality of Basel II: First, banks are required to hold a mandatory *capital conservation buffer* of 2.5 per cent. This buffer above the minimum could be used to absorb losses during periods of financial and economic stress. Second, Basel III requires, in addition to the conservation buffer, a discretionary *countercyclical buffer*, which allows national regulators to require up to another 2.5 per cent of capital (common equity or other fully loss absorbing capital) during periods of high aggregate credit growth. For any given country, this buffer will only be in effect when there is excess credit growth that is resulting in a system-wide build-up of risk. The countercyclical buffer, when in effect, would be imposed as an extension of the conservation buffer range. Conversely, the buffer would then be released when, in the judgment of the authorities, the released capital would help absorb losses in the banking system that pose a risk to financial stability.

Another key element of the Basel III regulatory capital framework is the introduction of a non-risk-based leverage ratio that will serve as a backstop to the risk-based capital requirement. In the build-up to the crisis, many banks reported strong Tier I risk-based ratios while still being able to build high levels of on- and off-balance sheet leverage. The use of a supplementary leverage ratio will help contain accumulation of excessive leverage in the system. Basel III therefore introduces a minimum 3 per cent leverage ratio, which will be based on Tier 1 capital. The leverage ratio will capture both on and off-balance sheet exposures and derivatives.

4.5.2. Changes to Pillar II (Enhanced Supervisory Guidance)

The focus of the changes to pillar II is to achieve firm-wide governance and risk management; enhanced supervision and management of risk concentrations (on both on- and off- balance sheet exposures and securitisation activities); the provision of incentives for banks to better manage risks and returns over the longer term; and sound compensation practices. Consequently, the BCBS

strengthened supervisory guidance in about six areas. Most notable is the *Liquidity Standards and Supervisory Monitoring.* It is a known fact that strong capital requirements are a necessary but insufficient condition for banking sector stability. Equally important is the introduction of stronger banking liquidity as inadequate standards were a source of both firm level and system-wide stress. To solve the liquidity problem of banks, Basel III introduced two required liquidity ratios: *The Liquidity Coverage Ratio (LCR), which* requires a bank to hold sufficient high-quality liquid assets to cover its total net cash flows over 30 days. The LCR is necessary to help banks withstand a stressed funding scenario that is specified by supervisors; *The Net Stable Funding Ratio (NSFR)*, which complements the LCR is a longer-term structural ratio designed to address liquidity mismatches. The NSFR requires the *available* amount of stable funding to exceed the *required* amount of stable funding over a one-year period of extended stress. The idea is to provide incentives for banks to use stable sources of funds. In addition to these liquidity standards, the Committee issued in September 2008 a guidance paper entitled *Principles for Sound Liquidity Risk Management and Supervision.* This guidance provides sound practices for managing liquidity risk in banks based on a fundamental review of the lessons learnt from the financial crisis. Other publications[22] that reflected enhancements to pillar II included: *Supervisory guidance for assessing banks' financial instrument fair value practices* (BCBS, 2009a); *Principles for sound stress testing practices and supervision* (BCBS, 2009b); FSB's *Principles for sound compensation practices* (FSB, 2009); *Principles for enhancing corporate governance in banking organisations* (BCBS, 2010a); and *Good Practice Principles on Supervisory Colleges* (BCBS, 2010b)

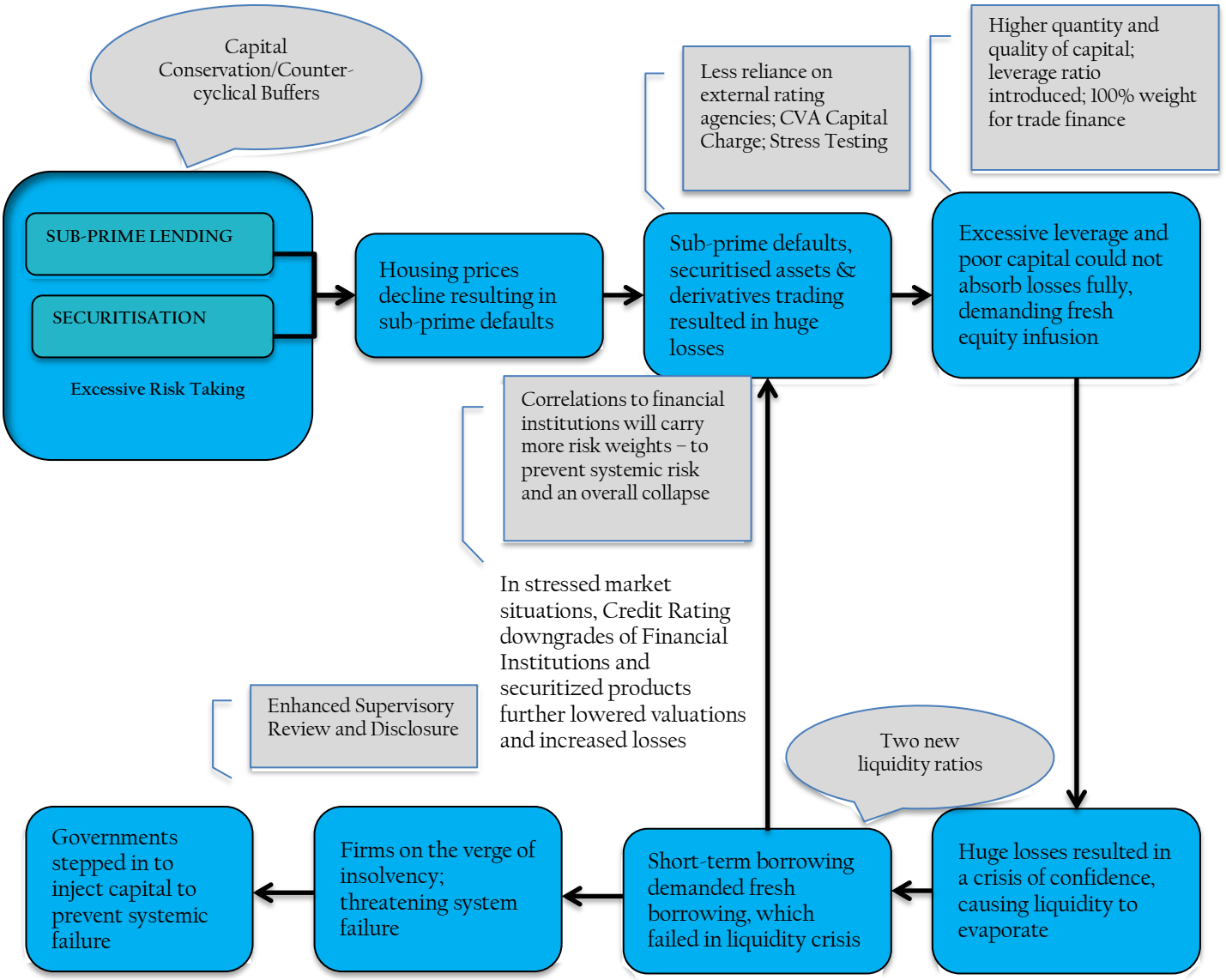
4.5.3. Changes to Pillar III (Enhanced Disclosure)

The major changes to Pillar III are in the area of enhanced public disclosure on securitisation exposures and off-balance sheet activities. In addition, Pillar III requires banks to disclose all components of their regulatory capital base and the features of capital instruments to be understood easily by the public. Pillar III also requires banks to disclose clear, comprehensive and timely information about their remuneration practices with the overarching aim of promoting more effective market discipline. These proposals will promote a level playing field in the banking industry and allow market participants make meaningful assessments of the risk profile of institutions.

Basel III framework attempts to plug the loopholes present in Basel II by requiring higher quantity and quality of regulatory capital. It also introduces ways to manage liquidity risks better over both short- and long-terms. Basel III also introduces an additional requirement of absolute leverage ratio to take into consideration the model error that might be present in risk-weighted assets (RWA) calculations. Figure 9 shows where and how Basel III will address the deficiencies in the Crisis Cycle.

[22] These and other similar publications are available on the Bank for International Settlements website http://www.bis.org/list/bcbs/index.htm

Figure 9: How Basel III will address Deficiencies in the Crisis Cycle



Source: Rohit *et al* (2010) - Infosys White Paper (pp.3)

In summary, Basel III rules will strengthen the capital reserves and introduce stringent reporting requirements that cover key risk, liquidity and leverage parameters. The timeline for the implementation of these reform measures by member countries begins on 1st January 2013 (see Appendix 1 – Basel III timeline). Member countries must translate the capital rules into national laws and regulations before that date. Capital standards will, however, be expected to rise each year from 2013, reaching their final level at the end of 2018. The parallel run period for the leverage ratio began on 1 January 2013, with full disclosure starting on 1 January 2015. The LCR would be introduced as a minimum standard on 1st January 2015, while the NSFR will move to a minimum standard by 1 January 2018.

CHAPTER 5: MICRO-PRUDENTIAL VERSUS MACRO-PRUDENTIAL REGULATION

Micro-prudential regulation and Macro-prudential[23] regulation are two key phrases that have now gained acceptability among regulators and supervisors worldwide following the recent global crisis. While micro-prudential regulation concerns itself with the safety and soundness of individual banking institutions, macro-prudential regulation considers the overall stability of the financial system as a whole and its link with the macroeconomy. Micro-prudential regulation examines the responses of an individual bank to exogenous risks but does not incorporate endogenous risk. It also largely ignores the systemic importance of individual institutions in terms of its size, complexity, extent of leverage and interconnectedness with the rest of the financial system (Brunnermeier *et al*, 2009). One of the key objectives of macro-regulation therefore is to serve as a countervailing force to the institutional blindness to risk during periods of boom and excessive credit growth and the subsequent rise in risk assessment during periods of subsequent collapse *(the bust)*. Many regulators and economists have admitted that the current regulatory framework is highly procyclical because it tends to magnify the business cycle (e.g. Kodres and Narain, 2009) and thus unable to weather the storm in times of financial distress. Before now, the regulatory approach assumed that by safeguarding individual institutions, the entire financial system will be safe. But this approach fails to work in practice, as many banks and other highly geared financial institutions tend to behave in a manner that jointly undermines the financial system. For example, in times when risk is perceived to be high, selling an asset could be seen as a prudent response by an individual bank. But if many banks follow this approach, asset prices will collapse, and such generalised downswings in asset prices may lead to huge volatility in asset markets. Prudential regulation of banks is therefore necessary to stem systemic risks by ensuring that banks hold sufficient capital at all times. While the individual safety of financial institutions is desirable, the distribution of risk across institutions within the financial system need not be ignored. The approach, therefore, as expounded in this handbook, calls for a strengthening of the macro-prudential aspect of financial regulation in order to ensure the stability of the entire financial system.

The rest of this chapter is structured as follows: Section 5.1 attempts to distinguish clearly between micro- and macro-prudential policies. It also gives the rationale for strengthening the macro-prudential orientation of financial regulation. Section 5.2 sets out the boundaries or perimeters of financial regulation, while section 5.3 takes a closer look at key aspects of microprudential regulation.

5.1. MICRO- AND MACRO-PRUDENTIAL REGULATION DISTINGUISHED

5.1.1. The Focus and Objectives of Financial Regulation

The distinction between the micro- and macro-prudential dimensions of financial regulation is best understood from the focus and objectives of the tasks of financial regulation as well as the model

[23] The term 'Macro-prudential' is not new in the regulatory circle. Its origin dates back to 1979 when the term was first used in a meeting of the Cooke Commission (the forerunner of the present Basel Committee on Banking Supervision, BCBS), which took place on 28-29, June 1979. The committee had justified concern that micro-economic problems were beginning to merge into macro-economic problems and that micro-prudential concerns had become linked with macro-prudential ones (See Clement, 2010 for more analysis on the evolution and use of the term till date).

used to categorise risk (see Table 1 below). It has less to do with the instruments or tools used in the pursuit of these objectives. Crockett (2000) and Borio (2003, 2006) offer a clear distinction between the two approaches as follows:

Table 1 - The Macro- and Micro-prudential Perspectives Compared

	Macro-prudential	Micro-prudential
Proximate Objective	Limit financial system-wide distress	Limit distress of individual institutions
Ultimate Objective	Avoid output (GDP) losses	Consumer (depositor/investor) protection
Model of risk	(In part) endogenous	Exogenous
Correlations and common exposures across institutions	Important	Irrelevant
Calibration of prudential controls	In terms of system-wide distress; top-down	In terms of individual institutions; bottom-up

Source: Borio (2003, 2006)

The *objective* of a macro-prudential approach to financial regulation is to limit the costs to the economy arising from financial distress, i.e. the failure of all or a major part of the financial system. Put simply, this means to limit 'systemic risk'. That of the micro-prudential approach is to reduce the likelihood of failure of individual institutions, regardless of their impact on the economy. Loosely put, this refers to limiting 'idiosyncratic risk'. Consequently, while the *ultimate objective* of micro-prudential regulation can be rationalised in terms of protecting consumers (investors and depositors) who have claims on financial institutions, that of macro-prudential regulation is to avoid output losses or reduce the negative externalities from financial system failure.
To highlight the distinction between the two dimensions more clearly, it is useful to draw an analogy with a portfolio of securities. Moving from a micro to a macro orientation can be likened to an individual security investor who becomes an investor in a mutual fund. Think for a moment that the financial system of an economy were a portfolio of securities, with each security representing a financial institution. Assume further that the losses on this portfolio represent the costs of output losses to the economy. The macro-prudential regulator behaves like a mutual fund investor who cares only about the loss on the whole portfolio rather than caring equally and separately about the loss on each individual security; its micro-prudential counterpart would care equally about the tail losses on each of the component securities.

The implications for *the calibration of prudential controls* are clear-cut. The macro-prudential approach takes a *top-down* approach, based on the likelihood and costs of losses on the whole portfolio. It first sets a relevant threshold or benchmark of acceptable tail losses for the portfolio as a whole. It then calibrates the prudential controls on the basis of the marginal contribution of each security to the relevant measure of portfolio risk. In other words, the macro-prudential approach looks at the risk profile of the whole portfolio rather than the risk of each security separately. As portfolio theory teaches, the mutual investor also cares about the degree to which the returns on the securities

move together (i.e. the correlations across securities). This is because losses on some securities can be offset by gains on others. By contrast, the micro-prudential approach is *bottom-up*. It sets prudential controls in relation to the risk of each individual security. The result for the overall portfolio arises merely as a consequence of aggregation. Correlations across securities are largely ignored.

Finally, we consider the *model used to characterise risk*. From a macro-prudential perspective, risk is assumed to be *endogenous* with respect to the behaviour of the financial system. This because financial institutions can collectively determine the price of financial assets, the volume of transactions (e.g. money borrowed or lent) and hence the strength of the economy itself. This in turn, has power feedback effects on the soundness of the institutions. By contrast, given its focus on individual institutions, a micro-prudential approach ignores such feedback, i.e. it assumes risk to be *exogenous*. Taken in isolation, individual institutions will generally have little impact on market prices or the economy as a whole.

5.1.2 Actual Practices of Regulators and Supervisors

The distinction between the micro- and macro-prudential perspectives can also be seen in terms of the actual practices of regulators and supervisors (Borio, 2003). First, let's take the micro-elements: the setting of prudential standards is based on the 'idiosyncratic risks' incurred by individual institutions; and the widespread use of *peer group analysis* is also micro-prudential in focus. Here, the benchmark is the average performance of institutions, irrespective of what the implications are in the aggregate; regulators also largely ignore the macroeconomic implications of supervisory standards. For example, supervisors are often reluctant to contemplate adjustments in standards or the intensity of supervision even when these are consequential for the macro-economy.

Let's now consider the macro elements. Interestingly, many prudential authorities for banks list the prevention of systemic risk as part of their objectives of financial stability, but these objectives are somewhat too vague to fully accommodate the ideals of a macro approach. For example, it is not unusual for the intensity of supervision to be tailored to the size and complexity of institutions, which in fact may be representative in part to the determination of their systemic significance. But most of the time, supervisors are not aware of the importance of aggregating risks across institutions. Sometimes too, the monitoring of risk transcends peer group analysis, to consider aspects relating to risk concentrations or exposures across individuals and institutions (e.g. asset concentration on a single borrower, in particular sectors or regions- for example through *segmental financial reporting* and the *sectoral distribution of credit*) and vulnerabilities to common shocks, e.g. asset price volatility (i.e. exchange rates, stock prices, interest rates) and other macroeconomic developments. Again, the collective behaviour of institutions and the macro implications of a shock to the system are *unconsciously* ignored in this approach.

For example, let's consider a *scenario on the macro implications of the task of micro-prudential regulation of banks*, which was adapted from Hanson, Kashyap and Stein (2011). Consider that the goal of capital regulation is to force banks to *internalise losses*, thereby *protecting the deposit insurance fund* and *mitigating moral hazard*. Thus, micro-prudential regulation is doing its job if the deposit insurer can minimise the probability of losses to the deposit insurance fund. In specific terms, consider a bank with

assets of ₦100 billion that is financed with insured deposits and some amount of capital. Suppose further that the volatility of the bank's assets is such that with probability 99.5%, the assets do not decline in value by more than 6% in a single quarter. Then if the goal of policy is to reduce the probability of bank failure (whereby capital is wiped out and there are losses to the deposit insurance fund) to 0.5%, this can be achieved by requiring the bank to have a capital equal to 6% of its assets as a cushion against losses. Notice that in this setting, the exact form of the capital is immaterial. It can be common equity or preferred stocks or subordinated debt, provided these instruments are not explicitly or implicitly insured – that is, as long as they can absorb losses when the bank is in distress (note that banks are required by the existing capital regulation to take immediate steps to restore its capital ratio when losses occur). Now, following our example, assume that the bank starts out with a capital of ₦6 billion, but then over the next quarter experiences losses of ₦2 billion, so that its capital falls to ₦4 billion. If the volatility of its assets remains unchanged, for its probability of failure over the subsequent quarter to stay at 0.5%, it would need to bring its capital ratio back to 6%. It could do so in two ways: either by going to the market to raise a fresh capital of ₦2 billion, or by leaving its capital unchanged and shrinking its asset base to ₦66.67 billion (that is, 4 billion/66.7 billion = 6%).

The fundamental critique of micro-prudential regulation can be understood from the following intuition: "When a micro-prudentially-oriented regulator pushes a troubled bank to restore its capital ratio, the regulator does not care whether the bank adjusts via the *numerator* or via the *denominator* – that is, by *raising new capital*, or by *shrinking assets*. Either way, the bank's probability of failure is brought back to a tolerable level, which is all that a microprudential regulator cares about" (Hanson, *et al*, 2011:3). Such indifference to the method of adjustment is sensible if we are considering a single bank that is in distress for peculiar reasons. The bank can choose to shrink its assets – perhaps by selling some of its marketable securities to stronger peers or by recalling some of its loans/reducing lending. However, where a large proportion of the financial system is in difficulty, a simultaneous attempt by many institutions to shrink their assets or reduce credit to the private sector can impose huge losses on the financial system itself and on the economy. These losses come in the form of loss of asset value, credit-crunch - leading to reduction in corporate investment and income, output losses, job losses, and so on. So, in essence, it is this fragility inherent in the financial system that provides the imperative for macro-prudential regulation to mitigate the economic and social costs associated with balance sheet shrinkage in the event of a shock hitting the system. The purpose of macro-prudential approach to regulation is for banks to be able to internalise these costs rather than exposing the society to huge losses. This can be done by requiring banks to always keep higher quality capital and build up reserves (capital buffers) ahead of time so that they can withstand shocks without needing to reduce assets or even raise fresh capital just when the shock occurs.

5.1.3. Why Is the Macro-Prudential Perspective Important?

From the foregoing argument, there are several reasons for strengthening the macro-prudential orientation of financial stability. Four of them can be considered as follows:

The Need for a Market-Wide Perspective

The rationale for strengthening the macro-prudential aspect of financial stability arises from the failure of the micro-prudential perspective to take full account of larger macro-prudential or

market-wide concerns. Clement (2010) identified at least three examples of how the micro-prudential perspective fails to incorporate market-wide concerns. First, while the growth of individual bank lending may look sustainable, that of aggregate lending may not necessarily be. Second, perceptions of risk may be inadequate narrowly focusing on the (past) performance of individual bank loans rather than on the broader risk of all borrowers. Third, individual banks tend to regard interest rate risk as critical and underestimate the importance of liquidity (funding) risk, which ultimately calls for a market-wide perspective. Besides, the effectiveness of supervision can be judged on the need to avoid gaps in the scope of regulation and the desirability of 'functional' as opposed to 'institutional' supervision as well as (Clement, 2010: 62). One can thus, argue that functional supervision may be based on the intuition that the financial system is made up of multiple constituents (i.e. institutions) functioning together and as such supervision should consider the contribution of individual institutions to the overall quantum of risk in the financial system (systemic significance), including correlation of exposures across institutions, which jointly undermine the stability of the financial system.

Concerns Over Financial Innovations

Macro-prudential concerns have also been related to the risks posed by financial innovation on the financial system as a whole. Here, the main focus is on the derivatives market and securitisation, which have been seen in recent times to be the driving force behind the growth of capital market activities around the world. As early as 1986, the Bank for international settlements (BIS) had identified a number of systemic concerns regarding the rapid development of products and growth of markets. These were documented in a report on '*Recent innovations in international banking*', (BCBS, 1986) which devoted a few paragraphs to the discussion on the concept of macro-prudential policy. The report highlighted several vulnerabilities: regulatory arbitrage (the under-pricing of risk on new instruments); the overestimation of their liquidity; the opaqueness of risk resulting from interconnections in the financial system; the danger of risk concentrations; the overloading of payment and settlement systems, reflecting a significantly higher volume of transactions; the potential for increased market volatility; and stronger growth in overall debt.

Concerns Over Pro-cyclicality

As noted earlier, the financial system faces the risk that the micro actions of individual banks may appear individually rational, but on the aggregate, may result in undesirable outcomes, due to the externalities involved. As argued in our earlier example, the reduction in a bank's assets in a time of financial distress, if replicated by other banks could induce 'fire-sales' and a credit-crunch, possibly increasing 'endogenous' risk and other externalities to the real economy. If lending contracts, many businesses will cut down on investments, income falls and the economy weakens. In this circumstance, the reduction in economic activity will in turn lead to a reduction in debt servicing by economic agents and subsequent deterioration in the loan quality of banks. These mutually reinforcing processes between the financial system and the real economy have been termed the '*Pro-cyclicality of the financial system*' (Borio, Furfine and Lowe, 2001; BIS, 2001, 2002). Crucially therefore, micro-prudential regulation is inadequate in today's financial system that is highly pro-cyclical. This is because it treats the risk facing individual institutions as 'exogenous', excluding the collective behaviour of institutions and the interconnections between them. Macro-prudential regulation is therefore needed to address this pro-cyclicality. Moreover, because the institutions themselves also feel the costs of financial instability, promoting a macro-prudential orientation will

help to prevent the individual institutions from failing. In essence, the macro-prudential objective subsumes the rationale for its micro-prudential counterpart, best expressed in terms of depositor/investor protection.

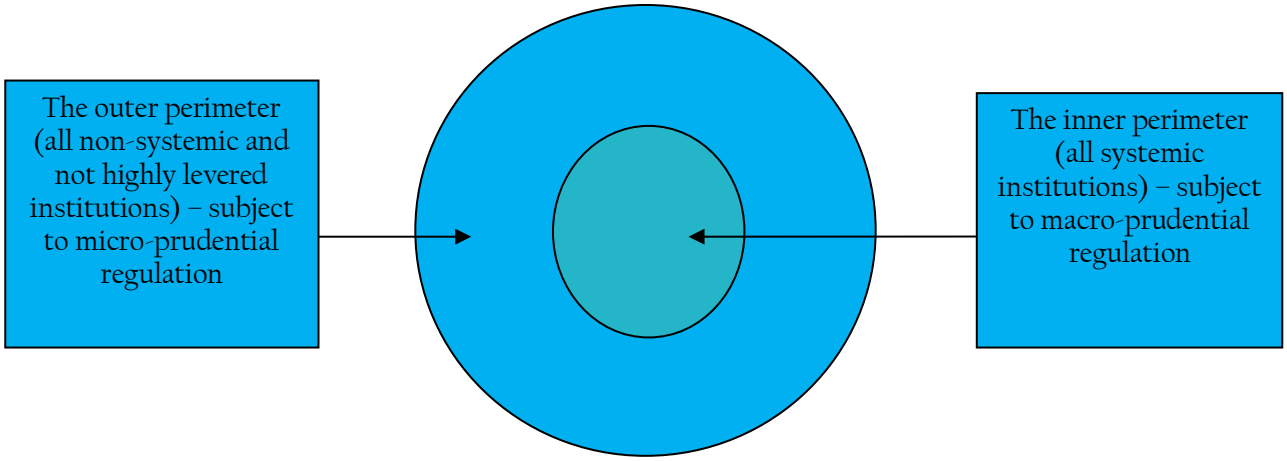
Balance Between Official and Market Discipline

Strengthening the macro-prudential aspect of financial stability also helps to achieve a better balance between market and policy-induced discipline, and hence better economic performance (Borio, 2006). In particular, if the goal of supervisors is seen as limiting the failure of *each* and *every* institution for which they are responsible, regardless of the system-wide consequences, the risk is that the public safety net may become overly protective and market forces may be excessively stifled. Resources can be misallocated and growth opportunities forgone. Moreover, through overly generous safety net arrangements, micro-prudential approach could induce perverse incentives for risk taking by banks and ultimately generate costly instability, which is the opposite of the very objective it seeks to attain. The point is that the pursuit of depositor protection objectives can best be attained via a combination of a macro-prudential orientation and more targeted protection schemes (Borio, 2003).

5.2. PERIMETERS/BOUNDARIES OF PRUDENTIAL REGULATION

Having looked at the rationale for aligning micro- and macro-prudential regulation, it is important to identify the set of institutions that need to be within the scope or purview of prudential regulation. To begin with, we can classify all institutions within the universe of financial service providers using a two-perimeter approach – the outer and inner perimeter (see figure 10). Following this approach, non-systemic and not highly levered financial institutions (e.g. insurance companies and pension funds) would be in the outer perimeter and be subject to full *micro-prudential regulation*, but no additional macro-prudential regulation. Those that pose systemic risks (both bank and non-bank institutions) would be moved to the inner perimeter and be subject to *macro-prudential regulation*. According to Brunnermeier *et al* (2009), the risk-spill over of a financial player on its counterparties is what is used to classify a financial institution as either 'systemic' or 'non-systemic'. The risk-spill over of a financial player can be high if it (i) *causes* financial difficulties at other institutions or it is (ii) simply *correlated* with financial difficulties amongst other institutions. A good risk-spill over measure should, however, encompass both channels.

Figure 10: Systemic and Non-systemic Perimeters of Regulation

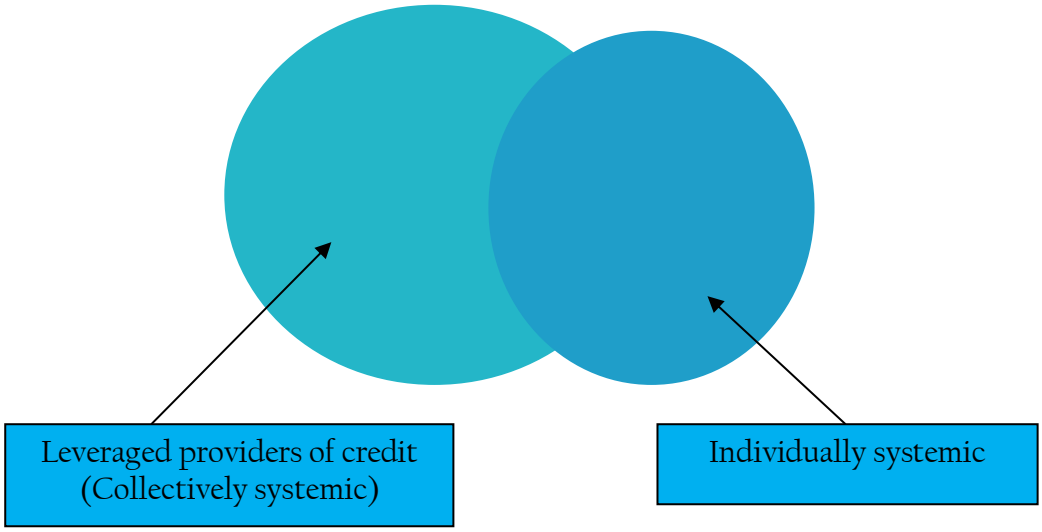


Source: Author's own representation, adapted from Brunnermeier et al (2009)

Within the inner perimeter subset of systemically important institutions, we can further identify two classes of institutions: all *collectively systemic* and *individually systemic* (see figure 11). The set of all collectively systemic institutions represent those institutions that influence the general provision of credit in the economy and consist of all leveraged providers of credit. Regardless of size, all leveraged providers of credit fall within the scope of macro-prudential regulation because it is their collective or aggregate weakness that poses systemic risk. Clearly, therefore, all commercial banks fall within this set of collectively systemic institutions. However, in some jurisdictions, some non-bank institutions are collectively systemic, for example in U.S, money market mutual funds are important providers of credit to corporations[24].

The second important set is that of all individually systemic institutions. The main characteristic feature of this type of institutions is that their individual failure can cause a disruption to the financial system and the economy at large through contagion. These institutions cause risk-spill overs because they are large and massively interconnected. They may not necessarily be leveraged providers of credit to the economy. They may instead provide credit, insurance or critical payment services to other parts of the financial system. A good example is AIG, an insurance company, which turned out to be large-scale sellers of credit, default swaps (CDS) and mortgage-related securities to other financial firms. Central counterparties (CCPs) are an example of firms that provide critical clearing services to the financial system. It is important that the probability of contagion from these institutions is effectively controlled.

Figure 11: Perimeters of Macroprudential Regulation



Source: Nier (2011)

Suffice it to note that the two sets of systemic institutions can overlap. Very large providers of credit can be individually systemic even if their failure has little impact on other parts of the financial system. This is so because a large proportion of the economy relies on the continued provision of credit services and because their activities could generate high-risk spillovers [e.g.

[24] Because they promise a fixed claim, they also can be viewed as leveraged institutions.

government sponsored entities (GSEs) in the U.S. like Freddie Mac and Fannie Mae]. Smaller banks, on the other hand, are not typically individually systemic, unless there are institutional weaknesses in the crisis resolution regime or payment systems, which can create significant disruptions even when a small bank fails (e.g. the failure of Northern Rock in 2007). The two sets of firms – collectively systemic and individually systemic also relate to the two dimensions of systemic risk – the 'time' and 'cross sectional' dimensions respectively. They also map out the tasks of macro-prudential policies as will be explained later in chapter 7.

CHAPTER 6: MICROPRUDENTIAL REGULATION AND STAKEHOLDER MANAGEMENT

As stated earlier, the aim of microprudential regulation is to ensure the safety and soundness of individual financial institutions and to protect key stakeholders in the financial system, including depositors, investors, and financial consumers. This chapter examines the role of microprudential regulation and supervision in this context. It examines risk-based supervision (RBS) and the CAMELS rating of banks, the role of deposit insurance systems, financial consumer protection and crisis management techniques.

6.1. RISK BASED SUPERVISION (RBS)

An effective supervisory authority is able to require a bank to take timely preventive and corrective measures if the bank fails to operate in a manner that is consistent with sound business practices or regulatory requirements. Traditionally, authorities have performed this role by way of *compliance-based supervision* (CBS). Under this method of supervision, banks must comply with a set of prudential rules generally provided under the regulatory code. The role of the supervisory authority is to ensure that banks in fact comply with these rules. In recent years, supervision has been evolving and shifting away from a style that is compliance-based to one that is risk-based. Randle (2009) provides a very insightful distinction between CBS and *risk-based supervision* (RBS). According to him, RBS requires supervisors to assess both system and individual firm risk and to respond with the supervisor's own processes and interventions in accordance with the assessment. This, in turn, allows supervisors to allocate resources to the banks with the greatest risk and areas within individual bank that are high risk.

RBS allows supervisors to examine the business model of the supervised entity to ascertain possible risks inherent in the strategy and the risk that the board may not have the competence or experience to execute the strategy effectively or the board and management may not be aware of any legal bottlenecks. RBS takes into account risks that are exogenous to the individual banks. In considering a bank's business strategy, the supervisor needs to understand the economy, the financial market and the activities of the bank's competitors as well as the effects of the risks that arise from these factors on the entity under examination. CBS generally does not consider these factors; it only specifies rules for the industry and does not consider specific bank risks. RBS, on the other hand, is focused on principles rather than compliance to rules. It is dynamic and forward-looking. For instance, RBS involves continuous updating of risk assessments through on-site reviews, off-site reviews and market intelligence that creates an 'early warning' or 'rating' system for the supervisory authority to anticipate and deal with emerging issues (Randle, 2009). The fundamental principle of RBS, however, is the relationship between risks and capital – the higher the risk profile of a financial institution, the higher the capital it must hold.

6.2. CAMELS RATING

One major task in conducting risk-based supervision is to assess the financial condition or health of individual financial institutions and rate the organisation's financial strength according to the institution's ability to support the level of risk associated with its activities. This assessment of financial condition is part of the Pillar 2 supervisory review process and often uses the US-inspired

CAMELS rating model[25]: *Capital Adequacy*, *Assets Quality*, *Management Efficiency*, *Earnings*, *Liquidity*, *and Sensitivity to Market Risk*. Regulators use these measures in adjudging whether a bank is financially sound or not.

6.2.1. Rating Components

Capital Adequacy: "C" stands for the adequacy of the financial organisation's capital position, from a regulatory capital perspective and an economic capital perspective as appropriate to the organisation. The evaluation of capital adequacy should consider the risk inherent in an organization's activities and the ability of capital to absorb unanticipated losses, to provide a base for growth, and to support the level and composition of the parent company and subsidiaries' debt.

Asset Quality: "A" stands for the quality of an organisation's assets. The evaluation should include, as appropriate, both on-balance-sheet and off-balance-sheet exposures and the level of criticised and nonperforming assets. Forward-looking indicators of asset quality, such as the adequacy of underwriting standards, the level of concentration of risk, the adequacy of credit administration policies and procedures, and the adequacy of management information system (MIS) for credit risk, may also form the regulator's view of asset quality.

Earnings: "E" stands for the quality of the organisation's earnings. The evaluation considers the level, trend, and sources of earnings, as well as the ability of earnings to augment capital as necessary to provide ongoing support for the organisation's activities.

Liquidity: "L" denotes the organisation's ability to attract and maintain the sources of funds necessary to support its operations and meet its obligations. The funding conditions for each of the material legal entities in the company structure should be evaluated to determine if any weaknesses exist that could affect the funding profile of the organisation.

Sensitivity to Market Risk: "S" stands for sensitivity to market risk and it is generally described as the degree to which changes in interest rates, foreign exchange rates, commodity prices, or equity prices can adversely affect earnings and/or capital. The adequacy and effectiveness of the market risk management process and the level of risk exposure are also critical factors in evaluating capital and earnings.

The microprudential supervisor also gives a composite rating after assessing the overall condition and soundness of the organisation based on ratings assigned to the individual CAMELS components. Apart from rating the organisation's financial condition, the examiner also rates the ability of the organisation's management to identify, measure, monitor, and control the key risks to the financial institution.

6.2.2. Rating Definitions

Rating 1 (Strong). A rating of 1 indicates that the organisation is financially sound in almost every respect. Any negative findings are basically of a minor nature and can be handled in a routine

[25] Rating models differ significantly in other jurisdictions such as Canada and UK. However, the essential elements are quite similar.

manner. The capital adequacy, asset quality, earnings, and liquidity of the organisation are more than adequate to protect the company from reasonably foreseeable external economic and financial disturbances. The company generates more-than-sufficient cash flow to service its debt and fixed obligations with no harm to subsidiaries of the organisation.

Rating 2 (Satisfactory). A rating of 2 indicates that the organisation is fundamentally financially sound but may have modest weaknesses correctable in the normal course of business. The capital adequacy, asset quality, earnings, and liquidity of the organisation are adequate to protect the company from external economic and financial disturbances. The company also generates sufficient cash flow to service its obligations. However, areas of weakness could develop into areas of greater concern. To the extent minor adjustments are handled in the normal course of business, the supervisory response is limited.

Rating 3 (Fair). A rating of 3 indicates that the organisation exhibits a combination of weaknesses ranging from fair to moderately severe. The company has less-than-adequate financial strength stemming from one or more of the following: modest capital deficiencies, substandard asset quality; weak earnings; or liquidity problems. As a result, the organisation and its subsidiaries (if any) are less resistant to adverse business conditions. The financial condition of the organisation will likely deteriorate if concerted action is not taken to correct areas of weakness. The company's cash flow is sufficient to meet immediate obligations but may not remain adequate if action is not taken to correct weaknesses. Consequently, the organisation is vulnerable and requires more-than-normal supervision. Overall, financial strength and capacity are still such as to pose only a remote threat to the viability of the company.

Rating 4 (Marginal). A rating of 4 indicates that the organisation has either inadequate capital, an immoderate volume of problem assets, very weak earnings, serious liquidity issues, or a combination of factors that are less than satisfactory. Unless prompt action is taken to correct these conditions, they could impair future viability. Institutions in this category require close supervisory attention and increased financial surveillance.

Rating 5 (Unsatisfactory). A rating of 5 indicates that the volume and character of financial weaknesses of the organisation are so critical as to require urgent aid from shareholders or other sources to prevent insolvency. The imminent inability of such a company to service its fixed obligations and/or prevent capital depletion due to severe operating losses places its viability in serious doubt. Such companies require immediate corrective action and constant supervisory attention.

6.3. DEPOSIT INSURANCE

Banks play a central role in financial intermediation by mobilising savings, allocating credit, and facilitating risk diversification, thereby supporting economic growth. A fundamental challenge in this process, however, is maintaining public confidence. Depositors must be assured of the safety of their funds before entrusting financial institutions with their savings. To address this concern, governments establish financial safety nets—typically comprising lender-of-last-resort facilities and deposit insurance schemes (Ketcha, 2007).

Deposit insurance is a core element of microprudential regulation designed to enhance financial stability and prevent disorderly bank failures. It protects depositors—either fully or partially[26]—against losses arising from a bank's inability to meet its obligations, thereby reducing the likelihood of bank runs and the inefficient liquidation of bank assets (Demirguc-Kunt, Kane and Laeven, 2008). Coverage limits vary across jurisdictions: in the United States deposits were historically insured up to $100,000; in the United Kingdom coverage was set at £85,000 following the 2007 Northern Rock episode (later reduced to £75,000); while in Nigeria, the Deposit Insurance Act (2006) guarantees up to ₦500,000 for universal banks and ₦200,000 for microfinance banks and primary mortgage institutions (NDIC, 2009).

Despite its widespread adoption, the effectiveness of deposit insurance remains debated. Theoretical models emphasise its role in preventing self-fulfilling bank runs[27] (Diamond and Dybvig, 1983; Chari and Jagannathan, 1988; Allen and Gale, 1998). However, critics argue that it weakens market discipline by encouraging excessive risk-taking among banks and reducing depositor incentives to monitor institutional behaviour (Karas, Pyle and Schoors, 2009). This creates a classic moral hazard problem: banks may pursue high-risk strategies knowing that losses are partially borne by the insurer, while depositors become less sensitive to risk.

The costs of deposit insurance can be classified as explicit and implicit. Explicit costs include insurance premiums paid by banks to the deposit insurance authority. Implicit costs arise from behavioural distortions—particularly moral hazard—which may lead to the under-pricing of risk and a misallocation of financial resources (Ketcha, 2007; Fischel et al., 1987; Benston, 1998). Depositors, shielded from losses, may shift funds toward higher-yield, riskier banks, while banks themselves may increase leverage and risk exposure.

Historical experience highlights the potential magnitude of these implicit costs. Deposit insurance-related moral hazard has been linked to the severity of crises such as the U.S. savings and loan crisis of the 1980s, banking crises in Scandinavia and Asia, and the global financial crisis of 2007–08. Moreover, deposit insurance may weaken depositor-driven corporate governance, as noted by Weinstein (1992) and Garten (1986, 2001), who argue that in its absence, depositors would demand higher risk premia or discipline banks more effectively.

Given the systemic risks posed by bank runs and financial contagion, eliminating deposit insurance is generally not considered optimal. Instead, the literature emphasises the importance of careful scheme design. Risk-mitigating features such as coverage limits[28], coinsurance, risk-based premiums, and enhanced market discipline can help contain moral hazard (Hovakimian et al., 2002; Mantripragada, 1992; Demirguc-Kunt et al., 2005). Similarly, credible limits on guarantees can incentivise large depositors and creditors to monitor banks more actively (MeCoy, 2006). Complementary regulatory measures—including prompt corrective action, restrictions on bank

[26] According to Demirguc-Kunt *et al* (2005), only Dominica Republic, Indonesia, Malaysia, Thailand, Turkey and Turkmenistan had full explicit coverage as of 2003.
[27] Bank runs is a situation where depositors rush to withdraw their deposits because they expect the bank to fail Diamond and Dybvig (1983).
[28] Coverage limits stipulates the types of institutions and depositors that the deposit guarantees cover and places a cap on the maximum amount of deposits that the government guarantees (Mantripragada, 1992).

entry, and the closure of undercapitalised institutions—are also critical in reinforcing the effectiveness of deposit insurance frameworks.

6.4. FINANCIAL CONSUMER PROTECTION

As discussed earlier in section 3.2.2 on the rationale for regulation, a key microprudential task for any regulatory structure is the protection of consumers. This may be part of a regulator's role, or a particular regulator may be established specifically for this sole purpose. In the UK, for example, consumer protection is one of the four core objectives of the Financial Services Authority (FSA), now known as the Financial Conduct Authority (FCA). Similarly, in Nigeria, consumer protection is *one* of the departments or functions within the Financial System Stability Directorate of the Central Bank of Nigeria (CBN). However, in USA and Australia, there is a specific regulatory body charged with the sole function of protecting consumers.

6.4.1. What Kind of Protection Should Be Provided?

The aim of any consumer protection objective is to secure an appropriate degree of protection for consumers. However, in determining the appropriate degree of protection, the microprudential regulator will need to have regard to the differing degrees of risk involved in different kinds of investment or other transaction; the differing degrees of experience and expertise that different consumers may have in relation to different kinds of regulated activity; the needs that consumers may have for advice and accurate information; and the general principle that consumers should take responsibility for their decisions. In a policy document issued by the FSA (1998), *Meeting our Responsibilities*, the FSA took the view that there were specific identifiable risks consumers may face. These are set out in Table 2.

Table 2: Principal Risks Consumers Face in their Financial Affairs

Consumer Risk Category	Description
Prudential Risk	The risk that a firm collapses, for example, because of weak or incompetent management or lack of capital
Bad Faith Risk	The risk from fraud, misrepresentation, deliberate mis-selling or failure to disclose relevant information on the part of firms selling or advising on financial products
Complexity/Unsuitability Risk	The risk that consumers contract for a financial product or service they do not understand or which is unsuitable for their needs and circumstances
Performance Risk	The risk that investments do not deliver hoped-for returns

Source: FSA (1998)

The FSA (1998) took the view that its role was to help in identifying and reducing prudential risk, bad faith risk and some aspects of complexity/unsuitability risk. It did not regard itself as having any responsibility to protect consumers from performance risk, which is inherent in investment markets - *provided* a firm recommending a product has explained the risks involved and not made

excessive and unrealistic claims. It argued that whilst the level of protection provided will depend on the sophistication of the consumer, the general principle must be that consumers should take responsibility for their decisions.

6.4.2. The Responsibility of Consumers

The FSA (2008) explained the responsibilities that should be upon consumers in relation to their dealings in financial services. It suggested that the role of consumers should be to be financially capable or confident. That is, to be able to manage money, keep track of finances, plan ahead, make informed decisions about financial products and stay up to date about financial matters. Consumers should also learn to stay engaged post-sale (e.g. request regular reviews), be willing and able to find the most relevant service and understand and be prepared to accept the consequences of not doing the above. For example, consumers should understand and accept results of inaction (e.g. low pension), understand what they are liable for (e.g. bearing the loss from buying the wrong product), and understand the roles and limitations of regulation and any compensation schemes.

6.4.3. Empowering Consumers: Improving Financial Capability

For consumers to take responsibility for their financial decisions, they must possess—or be able to acquire—an adequate level of financial knowledge and sophistication. This includes the ability to assess their financial needs, understand financial information, and engage effectively with providers and advisers to make appropriate choices. In essence, improving financial capability is fundamentally about reducing **information asymmetries** in retail financial services markets.

There are several complementary approaches to achieving this objective: (a) financial education; (b) improved access to relevant and timely information; and (c) the provision of generic financial advice. While not all of these require direct regulatory intervention, each can reduce the need for more intensive regulatory oversight by strengthening consumer decision-making.

(a) Financial education: Enhancing financial capability requires well-targeted, accessible education for children, young people, and adults. The goal is to ensure that individuals recognise the importance of financial planning, understand how to identify and address their financial needs, and know where to seek assistance. Better-informed consumers are more likely to select appropriate financial products and services, which may reduce regulatory burdens. Moreover, financially literate consumers are more likely to demand transparency and simplicity, thereby discouraging the proliferation of complex and opaque products. As noted by FSA (1999), "*the high-level aim of consumer education is to help consumers make informed choices and manage their financial affairs better. It should also, through growing consumer pressure, increase competition in financial services markets, leading to innovation, better quality and better value for money.*"

(b) Information provision: For information to be effective, it must be relevant, clearly presented, and delivered in a manner and at a time that suits consumers. Access to simple, authoritative, and independent information can help individuals determine their financial objectives, assess their risk preferences, and identify suitable financial products. Equipped with this knowledge, consumers are better positioned to compare alternatives and make informed decisions, often with the support of professional advisers.

(c) Generic advice: Regulators can also support financial capability by promoting access to generic advice services, delivered through human interaction, digital platforms, or a combination of both. Unlike product-specific recommendations, generic advice focuses on helping individuals understand their financial circumstances and identify appropriate courses of action. According to FSA (2004), generic advice comprises *"services and tools that use information about individuals' circumstances to help them to identify and understand their financial needs and to plan their finances."* It enables consumers to (a) identify suitable priorities, (b) determine next steps, and (c) access additional sources of information and advice.

6.4.4. The Role of Product Regulation

While increased access to financial information and education can significantly enhance consumer decision-making, these improvements are inherently gradual and may not fully address the needs of all consumers. A segment of the population will remain financially less literate despite such efforts, and for these individuals, problems associated with **information asymmetry** in financial services persist. This group cannot be overlooked within the regulatory framework.

One important policy response is the development of **"simplified" or "safe" financial products**. These products are designed to be easily understood and suitable for consumers with limited financial sophistication. To support this approach, regulators establish clear standards defining the features and conditions under which a product can be marketed as "simple" or "safe."

Within this framework, the role of the microprudential regulator extends to ensuring that financial institutions adequately test new products before market introduction. In many jurisdictions, regulators promote the creation of a **suite of standardised, simplified products**, accompanied by appropriate safeguards. Such products can often be distributed without the need for full regulated advice, thereby improving accessibility.

More broadly, product regulation provides an **embedded form of consumer protection**, reducing reliance on advisory services and lowering the fixed costs associated with consumer engagement. By designing safety features directly into financial products, regulators can enhance consumer protection while promoting wider participation in financial markets.

6.5. CRISIS MANAGEMENT TECHNIQUES

In chapter 4, attention was given to the various risks facing banks and the role of regulation and supervision in mitigating them. However, where these frameworks fail to prevent financial distress, crisis theory emphasises the need for regulatory intervention to limit systemic damage and contain negative externalities. In such situations, authorities must implement **immediate remedial measures (crisis containment policies)** and subsequently develop **medium- to long-term strategies (crisis resolution policies)**. As noted by Laeven and Valencia (2008), crisis management can be broadly divided into **"crisis containment"**—short-term measures aimed at stabilising the system—and **"crisis resolution"**—long-term policies designed to restore financial stability and normal market functioning.

6.5.1. Crisis Containment Policies

Crisis containment policies are **short-term corrective actions** aimed at restraining financial distress and preventing systemic collapse. These measures are typically implemented rapidly and do not involve complex institutional restructuring. Key instruments include:

(a) Deposit freeze: This involves the temporary suspension of deposit withdrawals (often through a banking "holiday") to prevent bank runs and allow regulators time to assess the situation. This approach is consistent with the bank run framework of Diamond and Dybvig (1983).

(b) Regulatory capital forbearance: Regulators may temporarily relax prudential requirements, allowing banks to overstate capital or delay recognition of losses to avoid a contraction in lending and stabilise the system.

(c) Emergency liquidity support: Central banks, acting as lenders of last resort, provide liquidity to solvent but illiquid banks when market funding dries up. While necessary, such interventions may create **moral hazard**, as banks could take excessive risks in anticipation of support.

(d) Government guarantees: Authorities may issue temporary blanket guarantees on deposits and other liabilities to restore confidence and prevent panic withdrawals.

6.5.2. Crisis Resolution Policies

Once immediate stability is achieved, attention shifts to **long-term resolution measures** aimed at restoring solvency, rebuilding confidence, and ensuring the resumption of normal financial intermediation. These policies typically involve coordinated actions between government and regulatory authorities and include:

(a) Nationalisation: The government may take temporary control of distressed banks, replacing management and, in some cases, revoking licences where institutions are no longer viable. This allows for orderly restructuring or liquidation.

(b) Recapitalisation: Systemically important banks are often recapitalised to restore solvency. This may involve government capital injections, purchase of distressed assets[29] (e.g., via asset management or quantitative easing programmes), assumption of liabilities, access to external credit lines, or issuance of new equity.

(c) New ownership and management: Following restructuring, banks are typically returned to private ownership—often under new, more competent management—to improve governance and operational efficiency.

(d) Deposit insurance: Deposit insurance schemes play a critical role in protecting depositors and maintaining confidence. Such schemes guarantee deposits up to specified limits—for example, $100,000 in the United States, £50,000 (revised after the Northern Rock crisis) in the United

[29] In some cases, the government can establish its own asset management company to buy and resolve toxic assets.

Kingdom, and under the Nigerian Deposit Insurance Act (2006), up to ₦500,000 for universal banks and ₦200,000 for microfinance banks and primary mortgage institutions.

CHAPTER 7: THE TASKS AND TOOLS OF MACRO-PRUDENTIAL REGULATION

The role of macro-prudential policy is to identify risks to systemic stability and to develop and implement a policy framework that tries to mitigate these risks. Although it is recognised that macro-prudential policies if implemented in isolation are unlikely to be fully effective in preventing crises, they can play a significant role by complementing other economic and financial sector policies (Nier, 2011). To this end, two major tasks are at the centre of macro-prudential policy: *monitoring financial vulnerabilities* and *calibration of policy tools to mitigate systemic risks.* In calibrating policy tools, the supervisor should pay particular attention to the focus or objectives of macro-prudential policy. As mentioned earlier, the objectives of macro-prudential regulation are: to reduce the expected costs to the economy of aggregate weakness in the financial system (i.e. to address the "time dimension" of systemic risk or "pro-cyclicality"); and to reduce the impact of the failure or weakness of an individual financial institution on other financial institutions, including to limit the likelihood of failure of individually systemic institutions (i.e. to address the 'cross sectional dimension' of systemic risk). These are now discussed in detail below.

7.1. MONITORING FINANCIAL VULNERABILITIES

The sources of systemic vulnerabilities in the financial system include but are not limited to the following factors: the build-up of macroeconomic and financial imbalances accompanied by favourable economic conditions (e.g. rapid credit growth, large capital inflows); financial innovation; low funding liquidity; rise in asset prices also fuelled by rapid credit expansion. These factors were evident prior to the global financial crisis. Faced with these factors, the macro-prudential regulator thus, has the responsibility of *measuring*, *monitoring* and *mitigating* systemic risk vulnerabilities over the life of a financial cycle. This section takes a look at the process involved in measuring and monitoring vulnerabilities that build up in the upswing. Risk should be measured and monitored continually over the length of time that the indicators of financial distress or signs of vulnerabilities hold sway. Experts say this is usually over the horizon of 2-4 years (Borio, 2006). There are a number of indicators of financial imbalances that serve as 'early warning signals' or predictors of system-wide distress, such as banking crises. We now take a look at how to construct early warning systems (EWS).

7.1.1. Constructing Early Warning Systems Using MPIs

Regulators and private market participants have over time developed a system of early warning indicators by which an attempt is made to predict the likelihood or otherwise of occurrence of financial crisis. Early warning systems (EWS) help policy makers to know at an early stage when a country is heading for a crisis to take preventive measures. These measures are often referred to as "macro-prudential indicators" (MPIs). There are at least three steps in the construction of EWS:

Step 1: Identify potential leading macro-prudential indicators and collate large pool of data.
Step 2: Define a crisis episode or scenario
Step 3: Analyse the indicators before a crisis

Step 1: Identify potential leading MPIs and collate large pool of data.
The IMF (2000) has specified a comprehensive list of macro-prudential indicators for analysing the health and stability of the financial system. These MPIs comprise both *aggregated micro-prudential indicators* of the health of individual financial institutions and *macroeconomic variables* associated with financial system soundness. Aggregated micro-prudential indicators are primarily contemporaneous or lagging indicators of soundness. Macroeconomic variables can signal imbalances that affect financial systems and are, therefore, leading indicators. Financial crises usually occur when both types of indicators point to vulnerabilities, that is, when financial institutions are weak and face macroeconomic shocks. Table 3 shows these MPIs at a glance.

In identifying macro-prudential indicators for any economy, care should be taken to consider the linkages between the real and financial sectors of the economy as these represent the most important sources of systemic risk vulnerability. Krugman (1979), Laeven and Valencia (2008) and Gadanecz and Jayaram (2009) have identified examples of leading macro-prudential indicators, which are crucial for observing the pathology of economic and financial crises in emerging markets like Nigeria. Below is a description of some of these key variables in terms of their signalling properties, i.e. how they provide early warning of financial vulnerabilities.

Economic Growth

- *GDP Growth* – GDP growth is indicative of the strength of the macro-economy (i.e. the ability of the economy to create wealth) and its risk of overheating. It is a key measure especially used in conjunction with measures such as credit expansion and fiscal deficit. Negative, or low positive values would indicate a slowdown; excessively high values may show unsustainable growth (Gadanecz and Jayaram, 2009).

Inflation

- *Domestic Price Volatility* – Inflation measures the rate of volatility of various domestic price indices. High levels of inflation would signal structural weakness in the economy and increased levels of indebtedness, potentially leading to a tightening of monetary conditions. Conversely, low levels of inflation could potentially increase the risk appetite in the financial markets.

Balance of Payments

- *Foreign Exchange Reserves/GDP* - A continuous fall in international reserves (e.g. via a fall in exports or rise in fiscal deficit) may signal domestic currency depreciation and hence a potential future speculative attack (i.e. investors supply more of the local currency by purchasing and keeping more of foreign currency).
- *Short-term Capital Inflows/GDP* - A high incidence of short-term capital inflows may introduce fragility risk into the financial system to the extent that the reversal of such inflows (especially during a recession) can have huge consequences on banks' solvency. If the ratio of short-term capital flows to GDP rises above a pre-determined threshold, it could give signals of an impending distress.

Table 3: Indicators for Macroprudential Surveillance

AGGREGATED MICROPRUDENTIAL INDICATORS	MACROECONOMIC INDICATORS
Capital Adequacy	**Economic Growth**
Aggregate capital ratios	Aggregate growth rates
Frequency distribution of capital ratios	Sectoral slumps
Asset Quality	**Balance of Payments**
Lending institution	Current account deficit
Sectoral credit concentration	Foreign exchange reserve adequacy
Foreign currency-denominated lending	External debt (including maturity structure)
Nonperforming loans and provisions	Terms of trade
Loans to loss-making public sector entities	Composition and maturity of capital flows
Risk profile of assets	
Connected lending	**Inflation**
Leverage ratios	Volatility in domestic prices
Borrowing entity	**Interest and Exchange Rates**
Debt-equity ratios	Volatility in interest and exchange rates
Corporate profitability	Level of domestic real interest rates
Other indicators of corporate conditions	Exchange rate sustainability
Household indebtedness	Exchange rate guarantees
Management Soundness	**Lending and Asset Price Booms**
Expense ratios	Lending booms
Earnings per employee	Asset price booms
Growth in the number of financial institutions	
	Contagion Effects
Earnings and Profitability	Trade spill overs
Return on assets	Financial market correlation
Return on equity	
Income and expense ratios	**Other Factors**
Structural profitability indicators	Directed lending and investment
	Government recourse to the banking system
Liquidity	Arrears in the economy
Central bank credit to financial institutions	
Segmentation of interbank rates	
Deposits in relation to monetary aggregates	
Loans-to-deposits ratios	
Maturity structure of assets and liabilities (liquid asset ratios)	
Measures of secondary market liquidity	
Sensitivity to Market Risk	
Foreign exchange risk	
Interest rate risk	
Equity price risk	
Commodity price risk	
Market-based Indicators	
Market prices of financial instruments, including equity	
Indicators of excess yields	
Credit ratings	
Sovereign yield spreads	

Source: IMF (2000)

Government Sector Financing

- *Fiscal Deficit/GDP* – This ratio measures the fiscal position of government in terms of availability of financing relative to fiscal expenditures or sovereign debt. High deficit values relative to GDP can mean unsustainable government indebtedness and vulnerability of the sovereign debtor. Rising budget deficit as a percentage of GDP may also imply increasing central bank financing of fiscal activities and hence loss of reserve money. A good example is the impact of the recent debt crisis in the Euro Zone and the U.S, which has seen rising fiscal deficits and dwindling banking system reserves.
- *Central Bank Credit to the Public Sector/GDP* - This also measures the central bank's direct financing of the public sector and reduction in the base money. Reduction in base money implies that the central bank has limited reserves to rescue banks in a period of bank distress.

Lending and Asset Price Booms

- *Credit-to-GDP Gap*: This measures deviations of the ratio of credit to private sector to GDP from its long run trend (usually 15 years for annualized data). This variable has been recently developed as a guide variable for taking capital buffer decisions. The larger the credit gap, the higher the systemic risk vulnerability.
- *Credit Growth* - Traditionally, credit growth is a measure of asset quality as it measures the riskiness of banks. Very rapid loan growth has often accompanied declining loan standards/greater risk. For example, the 2007-08 global crisis was partly caused by excessive leverage (fuelled by low interest rates) and poor credit risk assessment standards in the sub-prime mortgage market. Abnormal loan growth is often associated with an increase in loan loss provisions and lower capital ratios (Foos *et al*, 2010).
- *Stock Market Volatility* – Volatility measures the intensity of price movements on markets and the ease of trade on the market (market liquidity). Low volatility can be indicative of a calm market, but also of failings in the price discovery process. High volatility can mirror a disruption of market liquidity and excessive risk taking.
- *House Prices* – House price bubble fuelled by expansion in economic activities and consumption boom could signal potential losses to the financial sector in case of downturn in prices. A clear example is the 2007 crash in house prices in the US by more than 15%, which led to massive mortgage defaults and home delinquencies.

Capital Adequacy

- *Aggregate Capital Ratios* – This measures the size of banking system's capital cushion to address expected or unexpected losses. Excessively low levels of this ratio points to potential defaults and can be a forerunner of a banking crisis.

Asset Quality

- *Non-performing Loans (NPL)* - An increasing trend in the ratio of non-performing loans to total loans signals a deterioration in the quality of credit portfolios and, consequently, in financial institutions' cash flows, net income, and solvency. Excessively high non-performing loans can foreshadow a banking crisis.

Liquidity

- *Liquid Asset Ratio* – This ratio measures the amount of banks' readily available short- term resources that can be used to meet short-term obligations. Excessively low levels of this ratio can lead to a systemic crisis.
- *Deposits as a Share of Monetary Aggregates* - A decline in the ratio of deposits to M2, for example, may signal a loss of confidence and liquidity problems in the banking system. It could also indicate that nonbank financial institutions are more efficient in that they offer an array of other financial products, or they are acting as banks in all, but in name, or they may have set up pyramid schemes.

Interest Rates

- *Interest Rate Spreads* - Higher interest rates on deposits and lower lending rates (i.e. narrower bank spreads) may signal increasing competition, which may lead to greater risk taking. Though, competition amongst banks is good, it often leads to interest volatility. However, higher real interest rates could be a function of the central bank's inflation stabilisation policies.

Step 2: Define a Crisis Episode or Scenario

According to Laeven and Valencia (2008), a systemic banking crisis is characterised by a large amount of defaults by financial institutions and corporations who face huge difficulties in settling contracts on time. Consequently, non-performing loans increase markedly and all or most of the total banking system capital is exhausted. This situation may be accompanied by falling asset prices (such as equity or real estate prices) on the build-up to the crisis, rapid increase in real interest rates and a reduction or reversal of capital flows. In some cases, a banking crisis is triggered by depositors' run on banks. Bank runs can be said to occur when there is a monthly percentage decline in deposits in excess of 5%. Nevertheless, in some jurisdictions today, withdrawal of deposits can no longer be used to explain banking crises as deposit insurance and all forms of government liquidity support now exists. Reinhart and Rogoff (2011) define a systemic banking crisis to have occurred if two conditions are satisfied: (a) Bank runs that lead to closure, merger, or takeover by the public sector of one or more financial institutions; or (b) if there are no runs, the closure, merger, takeover, or large-scale government assistance of an important financial institution that mark the start of a string of similar outcomes for other financial institutions. Following recent crisis episodes, one can argue that modern financial crises stem from the asset side of the balance sheet, especially from poor asset quality and low liquidity. The poor performance of banking stocks relative to the overall equity market is also a typical indicator of a crisis episode.

Step 3: Analyse the indicators Before a Crisis

Once a typical crisis episode can be defined, the third step is to analyse the indicators before a crisis. Goldstein, Kaminsky and Reinhart (2000) provided an exposition on the analysis of indicators and crisis signals. A crisis signal indicates a departure from normal behaviour of the variable in consideration. It raises alarm of probable incidence of future crisis. An alarm is defined as a predicted probability of crisis above some threshold level (the cut-off point). For example, if the government's fiscal deficit as a percentage of GDP rises beyond a certain threshold, it could signal an impending crisis. A *threshold* is defined as a certain percentile of the frequency distribution

of the indicator variable, below or above which a variable sends a signal. The optimal systemic risk threshold has been estimated by some studies to be around 4.9%-8% for credit-to-GDP gap, -10% for equity price growth, and 130% for banking sector leverage (See Drehmann, Borio and Tsatsaronis, 2011; Lund-Jensen, 2012). If an indicator sends a signal that is followed by a crisis within a reasonable time frame (known as the *signalling window)*[30], it is called a *good signal*. If the signal is not followed by a crisis within that interval, it is called a false *signal or noise.*

7.1.2. Use of Macro-Stress Tests

Another method that can be used in monitoring financial vulnerabilities is macro-stress tests. The role of macro-stress tests in predicting the probability of system-wide distress is gaining increasing attention amongst macro-prudential policy makers. Macro-stress tests are analogous to micro-stress tests now routinely carried out by individual financial institutions to evaluate the risks hidden in their portfolios but relate to the financial system as a whole or a large proportion thereof, such as the banking sector. The specific methods used range from simple *sensitivity analyses* to more complex *scenario testing.* Sensitivity analysis is generally intended to assess the output or outcome from quantitative models when certain inputs or parameters are stressed or shocked. In most cases, sensitivity analysis involves changing inputs or parameters without relating those changes to an underlying event or real-world outcomes. For example, sensitivity test might explore the impact of varying declines in equity prices (such as by 10%, 20%, 30%) or a range of increases in interest rates (such as 100, 200 or 300 basis points) on the financial system or the macro-economy – See BCBS (2009) for more details. Macro-stress tests could involve identifying new threats to the financial system or new sources of systemic risk. But the underlying idea of macro stress tests is to assess the vulnerability of the financial system to adverse shocks using reasonable, but very tough circumstances (such as a major recession or an asset price collapse) and to evaluate the financial strength of institutions in withstanding such shocks. In emerging market countries in particular, the focus of macro-stress tests is usually on foreign currency and interest rate mismatches (Borio, 2006).

7.2. CALIBRATION OF POLICY TOOLS TO MITIGATE FINANCIAL VULNERABILITIES

Having identified the sources and indicators of financial system vulnerabilities, the next step is the mitigation of such risks. The mitigation of the degree of crisis vulnerabilities poses a range of difficult issues. *What tools are to be employed in mitigating the identified system-wide risks*? And on *what basis will these tools be adjusted*? As noted earlier, in calibrating policy tools, it is worth distinguishing between the cross-sectional and the time dimensions. The cross-sectional dimension refers to the relative calibration of instruments across financial institutions/parts of the financial system in relation to the distribution of risks across the system *at a given point in time.* The time dimension, on the other hand, refers to the calibration of tools in relation to the evolution of system-wide risk *over time.* This dimension is the same as addressing the notion of pro-cyclicality in the financial system.

[30] This time frame is called a *signalling window* and it is usually about 12 months for a banking crisis and 24 months for a currency crisis.

7.2.1. Addressing the 'Cross Sectional Dimension' (To Minimise Risk Spill overs from the Failure of Individual Financial Institutions)

The fundamental principle in the cross-sectional dimension is to calibrate prudential standards with respect to the (marginal) contribution of a particular financial institution to the risk in the overall financial system. Recall the analogy with the portfolio of securities: the risk of the individual security is irrelevant, but rather the extent to which the security adds to, or subtracts from, the risk in the overall portfolio (Borio, 2006). The most important task here is to discourage excessive direct exposures between financial institutions. This task can be complemented with an enhanced oversight of the payment, settlement and clearing arrangements, which plays a critical role in containing the impact of failure of financial institutions (Nier, 2011). The tools often used here include *limits on the size of exposures between institutions,* and *increased risk weights on exposures to other financial intermediaries.*

7.2.1.1. Assessing Systemically Important Banks (SIBs)

A crucial task in addressing the cross-sectional dimension of systemic risk, from a macro-prudential perspective, involves limiting the probability of individual failure by applying prudential measures that are sensitive to the systemic risk posed by individual institutions. Here, it is first important to be able to identify or assess the extent to which an institution on its own poses systemic risk to the financial system. Systemically important institutions are then subject to tighter supervision and in some cases more stringent quantitative standards (Borio, 2006). This is because of the negative externalities that are associated with their failure, which makes them critical for the stability of the financial system.

The Basel Committee on Banking Supervision has recently published a consultative document on its guidelines and assessment methodology for systemically important institutions (BCBS, 2011b). The document proposes five indicator-based assessment criteria for adjudging the systemic risk posed by important institutions. The selected indicators are chosen to reflect the different aspects of what generates negative externalities (or risk spill overs) and make a bank critical for the stability of the financial system. They include:

- *Size* of the banking institution
- *Interconnectedness* of the bank in the financial system
- *Substitutability* of services the bank provides
- *Global (cross-jurisdictional) activity* of the bank and
- *Complexity* of the bank's operations

The proposed methodology gives equal weight of 20 per cent to each of these five categories of systemic importance. These weightings are further divided into sub-categories (of multiple indicators) within each category of indicators, with the exception of size category (See Table 4).

Table 4: Assessing SIBs: Indicator-Based Measurement Approach

Category (and weighting)	Individual Indicator	Individual Weighting
Cross-jurisdictional activity (20%)	Cross-jurisdictional claims	10%
	Cross-jurisdictional liabilities	10%
Size (20%)	Total exposures as defined for use in the Basel III leverage ratio	20%
Interconnectedness (20%)	Intra-financial system assets	6.67%
	Intra-financial system liabilities	6.67%
	Wholesale funding ratio	6.67%
Substitutability (20%)	Assets under custody	6.67%
	Payments cleared and settled through payments system	6.67%
	Values of underwritten transactions in debt and equity markets	6.67%
Complexity (20%)	OTC derivatives notional value	6.67%
	Level 3 assets	6.67%
	Trading book value and Available for Sale value	6.67%

Source: BIS (2011b), pp.5

Assessing SIBs through Supervisory Judgement

The Basel Committee has recognised that no measurement approach will perfectly measure systemic importance across all global banks. Banks vary widely in their structures and activities, and therefore in the nature and degree of risks they pose to the (international) financial system. Hence, the quantitative indicator-based approach can be supplemented with qualitative information that is incorporated through a framework for supervisory judgement. Supervisory judgement is intended to capture information that cannot be easily quantified in the form of an indicator, for example, *a major restructuring of a bank's operation*.

The supervisory judgement process, however, is meant to support and not replace the indicator-based assessment approach. It could, however, override the results of the indicator-based measurement in only exceptional cases. Supervisory judgement can also be supported through the use of some ancillary indicators developed by the BCBS to capture specific aspects of the systemic importance of an institution that may not be captured by the indicator-based measurement alone (See Table 5).

Table 5: List of Standardised Ancillary Indicators

Category	Individual Indicator
Cross-jurisdictional activity	Non-domestic revenue as a proportion of total revenue
	Cross-jurisdictional claims and liabilities as a proportion of total assets and liabilities
Size	Gross or net revenue
	Equity market capitalization
Substitutability	Degree of market participation: 1. Gross mark-to-market value of repo, reverse repo and securities lending transactions 2. Gross mark-to-market OTC derivatives transactions
Complexity	Number of jurisdictions

Source: BIS (2011b), pp.11

I. Size

A bank's distress or failure is more likely to damage the global economy or financial markets if its activities comprise a large share of global activity. The larger the bank, the more difficult it is for its activities to be quickly replaced by other banks and therefore a greater chance that its distress or failure would cause disruption to the financial markets in which it operates. The distress or failure of a large bank is also more likely to damage confidence in the financial system as a whole. Size is therefore a key measure of systemic importance. Size can be measured using several indicators depending on the type of assessment methodology, i.e. whether indicator-based approach or supervisory judgment.

The main measure of size when using the indicator-based approach is:

- *Total credit exposures* as defined for use in the Basel III leverage ratio *(20% weighting)*.

Other ancillary indicators include:

- *Gross or net revenue:* Gross or net revenue of a bank could serve as a complement to the data on total exposure, by providing an alternative view of its size/influence within the local/global banking system.
- *Equity market capitalisation:* A bank's market capitalization could give an indication of the impact on equity markets given its failure. It could also serve as a rough estimate of its contribution to economic activity. It could more generally serve as a possible proxy measure of total firm value, which captures tangible and intangible value as well as off-balance sheet activities.

II. Interconnectedness

Financial distress at one institution can significantly raise the likelihood of distress at other institutions given the network of contractual obligations in which these firms operate. A bank's systemic impact is likely to be positively related to its interconnectedness vis-a-vis other financial institutions.

The indicators of interest here are the:

- *Intra-financial system assets (6.67% weighting)*
- *Intra-financial system liabilities (6.67% weighting)* and
- *Wholesale funding ratio (6.67% weighting)*.

The wholesale funding ratio is the degree to which a bank funds itself from other financial institutions via the wholesale funding market. This ratio is crucial in assessing the interconnectedness of banks because one of the main causes of the recent crisis was the excessive reliance on wholesale (non-stable) funding as against (more stable) retail deposits. Consequently, there was a market run on banks whose illiquid assets were financed by short-term liquid liabilities from the wholesale market, and this run spread quickly and widely to other institutions and markets. Thus, an institution with a high wholesale funding ratio poses a systemic threat to the financial system.

III. Substitutability

The systemic impact of a bank's distress or failure is expected to be negatively related to its degree of substitutability as both a *market participant* and *client service provider*. For example, the greater the role of a bank in a particular business line, or as a service provider in underlying market infrastructure, e.g. payments system, the larger the disruption will likely be following its failure in terms of both service gaps and reduced flow of market and liquidity infrastructure. Moreover, the cost to the failed bank's customers in having to seek the same service at another institution is likely to be higher for a failed bank with relatively greater market share in providing the service.

Three major indicators of substitutability have been suggested, each having a weighting of 6.67%:

- *Assets under Custody:* The value of assets the bank holds in custody for other customers and financial firms relative to the sum total for the industry or selected sample,
- *Payments cleared and settled through the payment system:* The volume of payments that a bank clears and settles on behalf of other market participants through the payments system relative to the sum total for the industry or selected sample, and
- *The values or share of underwritten transactions in debt and equity markets* relative to the sum total for the industry or selected sample.

The larger the value of these indicators, the more likely it is for the bank's failure to disrupt the operation of financial markets with potentially significant negative consequences for the local/global economy as the case may be.

Other ancillary indicators of substitutability or the degree of market participation include:

- *Gross mark to market value of repo, reverse repo, and securities lending transactions*
- *Gross mark to market OTC derivatives transactions*

These indicators are meant to capture a bank's importance to the functioning of key asset and funding markets, relative to other local/global banks in the sample. The greater a bank's estimated importance to these markets, the larger the anticipated disruption in the event of the bank's default.

IV. Global (Cross-Jurisdictional) Activity

The objective of this indicator is to capture the global activities of internationally active banks. The two indicators in this category measure the importance of the bank's activities outside its home (headquarter) jurisdiction relative to the overall activity of other banks in the sample. The idea is that the international impact from a bank's distress or failure should vary in line with its share of cross-jurisdictional assets and liabilities. The greater the global reach of a bank, the more difficult it is to coordinate its resolution and the more widespread the spillover effects from its failure.

The indicators of cross-jurisdictional activity include:

- *Cross-jurisdictional claims (assets) – 10% weighting* and
- *Cross-jurisdictional liabilities – 10% weighting*

Other ancillary indicators of cross-jurisdictional activity include:

- *Non-domestic revenue as proportion of total revenue:* A bank's share of total net revenue earned outside its home jurisdiction could provide supervisors with a measure of its global reach.
- *Cross-jurisdictional claims and liabilities as a proportion of total assets and liabilities*: A bank's share of total assets and liabilities booked outside of its home jurisdiction could provide supervisors with a measure of its global reach.

V. Complexity

The systemic impact of a bank's distress or failure is expected to be positively related to its overall complexity – i.e. its *business*, *structural* and *operational* complexity. The more complex a bank is, the greater are the costs and time needed to resolve the bank's difficulties.

Again, three major indicators are used here, each having a weighting of 6.67%:

- *The total notional or nominal amount of OTC derivatives* not cleared through a central counterparty (observed as a percentage of the sum total for the industry or selected sample). The greater the number of non-centrally cleared OTC derivatives a bank enters into, the more complex its activities. The failure of Lehman Brothers arose in part as a result of the complexity of instruments on which it traded, which made the resolution of the investment giant's distress unmanageable.
- The *total value of level 3 assets* a bank holds relative to the sum total for the industry or selected sample. Level 3 assets are illiquid assets that cannot be ascertained using market-based measures or models. Banks with a high proportion of level 3 assets on their balance sheets would face severe problems in market valuation in case of distress, thus affecting market confidence;
- *The total value of financial securities held in the trading book and available for sale securities* relative to the industry or selected sample. Higher values of this ratio could also generate spillovers through mark-to-market loss and subsequent fire sale of these securities in case an institution experiences severe stress. This in turn can drive down the prices of these securities and force other financial institutions to write down their holdings of the same securities.

An ancillary indicator for measuring complexity is:

- *Number of jurisdictions*: All else equal, the greater the number of jurisdictions in which a bank maintains its subsidiaries and branch operations, the more resource-intensive and time-consuming it may be to resolve the bank in the event of its failure.

7.2.2. Addressing the Time Dimension (To Minimise the Economic Costs of Aggregate Weakness)

From a macro-prudential perspective, addressing the time dimension relates to reducing the amplitude or size of the financial cycle, thereby limiting the risk of system-wide failure. This approach essentially involves building cushions in good times so as to draw down on them during bad times. A number of tools have currently been developed that may help address the sources of aggregate risks. These include dynamic capital buffers; higher quality capital; loan to value (margin) requirements; charges levied on vulnerable wholesale funding; contingent capital; and more generally other tools that can influence risk and pricing practices through the supervisory review process or through disclosure standards. I now attempt explain these tools in a little more detail.

7.2.2.1. Dynamic Capital Buffers

Dynamic or time-varying capital buffers require banks to maintain higher capital to asset ratios during credit booms and draw down on them during recessions. In other words, during favourable times, banks build up cushions in forms of insurance, without explicitly taking stance on the future evolution of the economy (Borio, 2003). Dynamic capital buffers ensure that in the event of an adverse shock hitting the economy, banks continue to operate with less pressure to shrink assets (Hanson, *et al*, 2011). Dynamic provisioning helps to address correlated exposures to credit risks (BIS, 2010) by allowing for earlier detection and coverage of credit losses in banks' loan portfolios (Saurina, 2011). The countercyclical nature of dynamic provisions enhances the resilience of each individual bank, as well as that of the whole banking system. In essence, dynamic capital requirements help to achieve both the micro-prudential objective of protecting deposit insurance fund and the macro-prudential objective of maintaining credit creation during recessions (Hanson *et al*, 2011). One major challenge of designing a countercyclical regime is that as the risk of banks' assets rises, market forces may impose a tougher discipline on banks than do regulators by refusing to fund institutions that are not adequately capitalised. In addition, loan provisioning may encourage banks themselves to play down on improving risk measurement and create incentives towards greater risk taking. Thus, there is still a tension about achieving a better balance between market and policy-induced discipline as discussed earlier.

7.2.2.2. Higher Quality Capital

Before the financial crisis, banks prided themselves in maintaining high Tier 1 capital to risk-weighted assets. Tier one capital is made up of common equity, preferred stock and other capital instruments. Thus, both equity and preferred stocks were counted in the same way towards satisfying capital requirements. This practice is reasonable from a micro-prudential perspective so long as the concern is protecting the deposit insurer in the event of failure. Because both common and preferred equity are explicitly subordinate in priority to the deposit insurer, they will provide the desired loss-absorption cushion. However, in the aftermath of the recent crisis, bank regulators have seen the need for banks to keep higher forms of quality capital (i.e. *holding more common equity*

relative to preferred stocks). Higher common equity provides more shock absorbing capital in the event of failure and is less problematic than preferred stock when banks have need to recapitalise to remain as a going concern[31].

7.2.2.3. Loan to Value (Margin) Requirements

LTV requirements in markets for collateralised credit will help to address correlated market risks. Bank supervisors should calibrate prudential standards that restrict banks from lending to investors with smaller margins (or haircuts) than the market is willing to offer for similar risk securities. Collateral requirements should also be strengthened to minimise perverse risk incentives on the part of the investors. Geanakoplos (2010) also suggested that the *regulation of leverage* is the key antidote to preventing moral hazard in firms. According to him, the most direct way to regulate leverage might be by empowering a '*leverage supervisor*' who could simply forbid loans at too high leverage in good times, setting different leverage limits for different securities. Supervisors should ensure that banks are not allowed to lend more than 70 per cent of the assessed value of a residential property (e.g. in Hong Kong) and should prevent money and capital market lenders from reducing haircuts too low. It has been argued that setting margin limits is often difficult because of the heterogeneity of securities. However, a good practice will be for the central bank to collate and combine past data on *security leverage*, *investor leverage*, and *asset price* data, to manage future leverage cycles.

7.2.2.4. Managing Risks from Capital Flows

Macroeconomic imbalances and systemic vulnerabilities also stem from large capital inflows to the financial system. The macroeconomic effects of large inflows include overheating the economy and appreciation of the currency, which can reduce competitiveness. Recent research confirmed that capital flows have contributed to the build-up of financial sector imbalances over the period between 1997-2007 across the OECD (Merrouche and Nier, 2010). From a macro-prudential perspective, the relevant concern is the contribution of capital flows to the build-up of systemic vulnerabilities in terms of direct or indirect financial sector exposures to unsustainable private or public debt levels, asset price booms and overvalued exchange rates as well as the liquidity and solvency pressure on the financial sector as flows cease or reverse direction (Nier, 2011).

A range of macro-prudential tools can reduce potential systemic risks associated with capital inflows. One example is *countercyclical buffer*, which is connected to the build-up of credit growth, especially when triggered by a *broad indicator of credit that captures both domestic and foreign provision of loans*. Secondly, supervisors can *impose a charge or levy on the use of short-term wholesale funding* to potentially discourage banks from overreliance on vulnerable wholesale funding, regardless of whether that funding is sourced domestically or from abroad. For example, in some countries, the central bank has imposed *reserve requirements* to discourage strong increases in foreign exchange funding. Korea recently announced a *macro-prudential levy* on foreign exchange-denominated liabilities of the banking sector[32].

[31] See Hanson *et al* (2011) for further discussion on this.
[32] Details of country experiences with the effectiveness of some of these measures are discussed in IMF (2010)

7.2.2.5. Contingent Capital

This is a corrective action policy, which attempts to force ailing banks to recapitalise with a contingent instrument, which automatically increases a bank's equity position when some pre-determined contractual provision is triggered (Hanson *et al*, 2011). Two broad types of contingent capital instruments have been proposed:

- *Contingent convertibles or reverse convertibles:* This involves a bank issuing a debt security that automatically converts into equity if a measure of either the bank's regulatory capital or stock market value falls below a fixed threshold (Flannery, 2005). For example, in November 2009, Lloyds Bank issued £7.5 billion in contingent convertible debt, with conversion to equity to be triggered if Lloyds' Tier 1 capital ratio falls below 5 per cent.
- *Capital insurance*: This involves a bank purchasing an insurance policy that pays off in bad times. To ensure that the insurer does not default, the policy would be fully collateralised, implying that the insurer is required to set aside the full amount of the policy upfront. For example, a bank might contract with a pension fund to buy a capital insurance policy that pays ₦2 billion in the event that an economy-wide index of bank stock prices falls below some designated value any time in the next five years. Upon consummating this transaction, the pension fund would turn the ₦2 billion over to a custodian; if the bad state is not realised within five years, the ₦2 billion reverts back to the pension fund, and if it is realised, the funds are transferred to the bank.

In essence, both types of contingent capital would ensure the maintenance of very large equity buffers. However, it may be more valuable to develop a financing arrangement that delivers more equity in bad states. Suffice to say that because contingent capital is required to count towards regulatory capital, it is usually a more costly form of finance and is used infrequently. Contingent capital can as well be used by authorities to bail-out troubled banks who would otherwise become non-viable (BIS, 2010). For example, it would also be recalled that the Central Bank of Nigeria (CBN) in 2009 injected ₦ 620 billion worth of Tier II capital into ailing banks in the form of a seven-year convertible bond to stabilise the system and restore confidence to the market. However, in this case, the banks would be required to pay back the capital from the proceeds of their re-capitalisation exercise (CBN, 2010).

7.2.2.6. Liquidity Risk Management

Bank supervisors can also implement a robust liquidity risk management framework. The Basel Committee has developed benchmarks, tools and metrics that supervisors can use to promote more consistent liquidity standards. However, such revised rules should: take into account the danger of sources of wholesale liquidity as noted earlier; and specify the need for banks to hold predominantly safer government debt instruments for liquidity reserve purposes *(higher liquidity ratio)* as opposed to risky wholesale or foreign exchange securities and high yielding structured finance products used more recently in the build-up to the crisis. Brunnermeier *et al* (2009) have also proposed the imposition of a *capital charge against illiquidity*. Conceptually, this implies that regulatory capital should be set aside against the riskiness of the combination of an asset and its funding, since the riskiness of an asset depends to a large extent on the way it is funded. The goal or the objective of liquidity adjusted capital charges is to reduce funding liquidity risk by encouraging banks to find longer-term funding and dissuade them from greater leverage.

7.2.2.7. Systemic Capital Requirements

Capital requirements for banks could be set with the goal of achieving a level of systemic credit risk that a policymaker is willing to tolerate. Regulators can calibrate systemic capital requirements based on the interconnectedness of the financial system, which makes it vulnerable to contagious shocks. Webber and Willison (2011) describe a system-wide risk management approach to deriving capital requirements for banks that reflect the impact their failure would have on the wider banking system and the likelihood of contagious losses occurring. These are referred to as "systemic capital requirements". Acharya et al. (2010) proposes that to align incentives of banks with that of the macro-prudential authorities, the regulator optimally imposes a systemic risk tax or capital requirement on each bank which is related to the sum of its expected default losses and its expected contribution to a systemic crisis, known as *Systemic Expected Shortfall (SES)*. In other words, systemic capital requirement on Bank A = Bank A's Expected Default Losses (EDL) + Bank A's Systemic Expected Shortfall (SES), which is the expected amount of undercapitalization in a future systemic event in which the system as a whole is undercapitalized.

CHAPTER 8: ISSUES AND CHALLENGES IN IMPLEMENTING PRUDENTIAL REGULATION

The implementation of both micro-prudential and macro-prudential regulation does not come without challenges. There are often conflicts or trade-offs that exist between the micro and the macro- dimensions of financial regulation. There are also governance challenges in effectively implementing a macro-prudential policy regime. This chapter is devoted to examining these issues and challenges.

8.1. CONFLICTS BETWEEN MICRO AND MACRO-PRUDENTIAL PERSPECTIVES

Supervisors typically have micro- and macro-prudential objectives. As noted earlier, the micro-prudential objective can be understood as the objective of limiting the likelihood of failure of individual institutions, while the macro-prudential objective can be rationalised in terms of limiting the likelihood of failure of significant portions of the financial system and the associated costs (Crockett, 2000). Microprudential supervision focuses on banks' idiosyncratic risks and is typically carried out by enforcing a uniform set of bank standards on each single bank. Macro-prudential supervision, on the other hand, is concerned with threats to systemic bank stability arising from common shocks or from contagion from individual bank failures to the rest of the financial system. Morttinen *et al* (2005) noted that: "Macroprudential analysis complements the work of microprudential supervisors, as the risk of correlated failures, or the economic or financial market implications of problems of financial institutions are not directly covered under the micro-prudential perspective" (pp.7). If both dimensions of prudential supervision rest with a single agent, the micro- and macro-prudential objectives may conflict with each other.

8.1.1. The Problem of Time Inconsistency

The basic challenge facing any supervisor that pursues both micro- and macro-prudential objectives is to administer micro-level standards and rules in a manner that serves the macro-prudential objectives in the long run. This long-term balancing act may create tensions in the short-run enforcement policy and may render rule-based micro-prudential supervision time inconsistent (Claeys and Schoors, 2007). In essence, actions dictated by a strict rule-based regulatory enforcement may become undesirable if long-run macro-prudential concerns are also in the supervisor's objective function, drawing the supervisor towards a policy of *regulatory forbearance*. For example, the supervisor may want to take into account the risk spill overs between institutions that are closely interconnected to each other, as the regulatory failure of a large deposit bank may undermine depositor confidence, giving rise to contagion and escalating the risk of systemic instability. If banks are aware of this time inconsistency – i.e. the conflict between the short-run and long-run concerns of the supervisory authority, they may in fact have incentives to alter their behaviour in a manner that is undesirable to the health of the system. In addition, the incentive structures in financial markets can further compound the difficulties in measuring systemic risk. Diversified shareholders with relatively short investment horizons can demand overly ambitious returns from their banks. This fuels competitive pressures, which then encourages risk taking. Moreover, the remuneration schedules for market traders and money managers can pose similar concerns (Crockett, 2000).

8.1.2. Trade-offs Between Costs and Benefits of Micro- and Macro-Prudential Policies

From the above argument, the benefits of specific macro-prudential policies – reduction in the probability and severity of financial crises – are long-term and not easily measured. At the same time, macro-prudential policies will almost always have an immediate and highly visible adverse effect on the profitability of financial intermediaries (and hence impact negatively on shareholder/investor value). They may also sometimes have an effect on the availability and price of financial services to households and firms (e.g. reduction in the loan-to–value ratio). When the costs of macro-prudential policies are more certain and visible than the benefits, this makes it hard for the policymaker to develop the resolve to take actions (Nier, 2011). Conversely, as noted earlier, if the micro-prudential regulator is more oriented towards protecting the deposit insurer from losses to the safety net, any policy-induced actions taken by a distressed bank, if not well thought-through, could have adverse system-wide and macro-economic effects (e.g. via reduction in lending and asset shrinkage as examined earlier). There is therefore a tension between the micro-prudential objective of preventing individual bank failure and the macro-prudential concerns of system-wide stability.

8.1.3. Rules Versus Discretion

The conflicts between the micro- and macro-prudential perspectives can also be explained by the extent to which regulators apply rule-based policies versus discretionary supervision and hence the extent of regulatory forbearance they exercise. Regulators may have ambiguous incentives for regulatory forbearance. Regulatory discretion may incentivise "reputation-seeking regulators" to show "more-than-optimal forbearance", since they want to leave their jobs with a clean slate. This tendency to polish their resume suggests that a rule-based prudential control might be better (Claeys and Schoors, 2007). Some of the major flaws of Basel II are that it is too micro-prudential focused and tends to give too much discretion to regulators and supervisors (regulatory capture). Many economists have therefore proposed that if there would be a shift towards a more macro-prudential orientation, objective criteria and pre-specified rules should be put forward to guarantee that financial regulation is strictly enforced, but should allow for very minimal discretion. Rules-based approach seems more transparent and predictable. It tends to reduce the stigma of regulatory forbearance in enforcing or relaxing regulatory standards - whether micro- or macro-prudential in nature. The advantages of rules notwithstanding, many regulators have argued that a mix of rules and discretion is desirable. For example, from a macro-prudential perspective, discretion-based approach can provide a well-informed central bank with greater flexibility to incorporate a range of indicators and expert analysis (Gordy, 2011) in dealing with systemic risk. Some BCBS guidance documents already allow national regulators to override rules when the need arises. However, as discussed earlier, discretion is applied as a support to pre-specified rules only in exceptional circumstances.

The debates that exist between the use of rule-based approach and supervisory discretion draw us closer to the next section on the governance challenges involved in implementing an effective macro-prudential policy.

8.2. MACRO-PRUDENTIAL POLICY IMPLEMENTATION CHALLENGES

The implementation of macro-prudential policy does not come without challenges. We will consider two of such challenges: the need for adequate powers for supervisors; and the need for policy coordination. These discussions are contained in Nier (2011) and are detailed below:

8.2.1. The Need for Adequate Supervisory Powers

The dynamic nature of the financial system has important implications for the macro-prudential policy maker. With rapid changes in technology and product innovations, banks continuously seek to exploit profitable opportunities. As the financial sector is evolving dynamically through time and across products and markets, the macro-prudential policy maker also needs to have adequate powers to constrain new systemic risks that emerge from the resulting changes in institutions' business models. There are a number of reasons for this ideology as given by Nier (2011). First, the set of *collectively systemic institutions* can change when there is an increase in the provision of credit, especially by non-bank institutions. Second, the *set of individually systemic institutions* can change when new and sizeable exposures emerge between institutions. Third, the *level of systemic risk* can change at the aggregate or sectoral levels, when asset prices are fed by an extension of credit to a particular sector, such as residential real estate or the capital market sector. Systemic risk can also change at the level of individual institutions, when firms grow or shrink in size or change in their importance to the financial sector at large.

It therefore follows that a static set of rules and regulations would risk the chance of being outpaced by a dynamically evolving financial sector. The macro-prudential policy framework must instead enable a flexible response. This requires the devolution of adequate powers to a macro-prudential authority. According to Nier (2011), three types of powers are needed: Information collection powers; designation powers; and rulemaking and calibration powers.

8.2.1.1. Information Collection Powers

The macro-prudential policy maker must have powers to collect information from all financial service providers, especially those that have the capacity to pose systemic risks to the financial system. This is required to be able to determine the appropriate perimeters of macro-prudential intervention as well as assess the level and distribution of risks within the financial system as a whole. So, what type of information can be collected to enable these assessments? - Information on *exposures; business models*; and *levels of leverage of individual firms.* To ensure the frequency and robustness of data, the supervisory authority can conduct regular assessments and collect additional data from data commercial warehouses such as credit bureaux and rating agencies.

8.2.1.2. Designation Powers

The macro-prudential authority also needs to have the power to designate institutions in accordance with the level of their systemic significance. For example, the authority can designate institutions as *individually systemic*, based on its analysis of the systemic risk posed by the institution. In addition, the macro-prudential authority should have power to bring within the scope of its policies all *collectively systemic* institutions. This is so that these institutions can be included where necessary in the application of policies that reduce the cost of aggregate weakness and to manage inter-connections between this set of firms and those categorised as individually

systemic. These classifications should, however, include both bank and non-bank financial intermediaries.

8.2.1.3. Rulemaking and Calibration Powers

The macro-prudential supervisor also needs to have rulemaking and calibration powers so as to constrain systemic risk to the average level. Examples here include the powers to calibrate dynamic capital buffers as well as capital and liquidity surcharges for individually systemic financial institutions. However, as systemic risk evolves through time and across sectors, there are concerns that the dynamic calibration of rules will impose significant costs to financial service providers and place more burdens on some system players than on others. In this light therefore, for macro-prudential policy to be fully efficient and effectively internalise the level of systemic risk, the calibration of rules should be complemented by supervisory discretion as noted earlier.

8.2.2. The Need for Policy Coordination

The vesting of powers on the main macro-prudential authority is unlikely to fully curtail systemic risks unless there is an effective coordination between the prudential agency and other relevant stakeholders. For example, there should be some level of harmony between the monetary authority and the macro-prudential agency because there are conflicts in the roles that they pursue. The primary aim of monetary policy is to maintain price stability, with financial stability as a secondary objective. The monetary authority can contribute to financial stability, while it cannot be relied upon as an effective tool for tackling systemic risk. If the monetary authorities are so keen on anchoring inflation expectations, it might not take into cognisance the financial stability risks that flow from its policy stance (e.g. the impact of higher interest rates on business cash flow, investment and income). Conversely, the macro-prudential policy maker may want to consider the monetary stability objectives of its actions in deciding its regulatory stance (e.g. the price stability implications of requiring too much liquidity). There is therefore a need to determine the optimal course of action between complementary, but sometimes conflicting policy objectives. The new institutional framework in U.K provides an example of such arrangements, with a Financial Policy Committee (FPC) established alongside the existing Monetary Policy Committee (MPC).

The need for coordination is not only limited to prudential regulation and supervision, but likely to extend also to securities regulation, as well as competition and fiscal policy. This is because actions in each of these domains can likewise have a bearing on systemic risk. In this light, the macro-prudential policy maker should have *powers to direct the actions of other policy makers* or *be assigned powers over specific policy tools* when it spots threat to systemic risk arising elsewhere other than its immediate jurisdiction. For example, for specific fiscal instruments, such as taxes and subsidies that affect incentives to take on leverage, the macro-prudential authority could issue advice or formal recommendations. Similarly, for regulations and decisions issued by securities regulators and competition authorities that affect the structure of the financial industry, it is expedient for the macro-prudential policy maker to be formally consulted, to ensure due account is taken of financial stability implications. Apart from having powers to recommend or direct policy actions, the macro-prudential authority can be vested direct and binding powers in the calibration of specific regulatory tools that are assigned to the authority. When such tools are introduced through primary legislation, the law can task the macro-prudential authority with their (dynamic) calibration, mandating that they be geared towards reducing the level of systemic risk. An example

of direct power from a *fiscal stance* is the calibration of levy on bank's use of non-deposit funding sources. An example related to *competition policy* is the creation of powers to force the divestment of business lines on the part of systemically important institutions, so as to avert threats to financial stability, as established under the Dodd Frank Act for the Federal Reserve. In *securities market regulation*, the macro-prudential authority could also be vested direct powers to calibrate margin requirements.

CHAPTER 9: CONCLUSION AND POLICY IMPLICATIONS

This study has reviewed the role of regulation and supervision in promoting and achieving financial stability. Chapter 1 provided some background and justification by way of introduction. Chapter 2 examined the conceptual and definitional issues, including the theories of financial stability/instability, the elements of financial stability analysis and the transmission channels between the financial and real sectors. Chapter 3 considered the economic rationale for financial system regulation and supervision. The 'public interest' argument represents the most powerful argument in favour of regulation and supervision. Rather than assuming a hands-off position on the oversight of financial institutions and market activities, the central bank should increase its role in guiding financial behaviour along lines that contribute to stability. The systemic risk rationale and the fiscal costs of crises justify the role of government intervention. Regulation and supervision are also necessary to protect investors and depositors from the opportunistic behaviour of banks and ensure a stable, efficient and reliable financial sector. However, there have been significant concerns that regulation and supervision can only reduce (but not eliminate) the probability of future crises occurrence because financial innovation always arises as a response to regulation.

In chapter 4, the risks inherent in the financial system were highlighted. They included credit risk, market risk, liquidity risk, operational risk, reputational risk, strategic risk, and regulatory risk, among other variants of risk. The way that regulation can mitigate these risks is twofold: by requiring compliance to conduct of business rules; and by applying prudential standards such as capital requirements, liquidity standards, credit concentration limits, and the likes. However, previous regulatory models, namely the Basel II framework, failed to mitigate such risks, especially those posed by excessive leverage, illiquidity, low loss absorbing capital and securitisation of assets, which were all factors that led to the build-up of the recent crisis. The global financial crisis was caused by the interaction of micro and macro elements. That is, the "*micro*" behaviour of banks and other financial institutions in creating new financial assets and the "*macro*" economic strategies pursued by the world's major countries. Policies should therefore concentrate on covering these interactions if the likelihood of future crises is to reduce. The consequences of a global downturn like this can be very severe both in terms of huge fiscal costs and external imbalances in the terms of trade. Authorities and policy makers in many countries have developed a range of additional instruments to control the growth of the financial sector and its interactions with the wider economy. The Basel Committee on banking supervision, following the lessons learnt from the crisis, has now developed new approaches to regulation enshrined in the new Basel III. These reform measures will, among other things, curtail both micro-systemic and macro-systemic risks that have threatened global financial stability. The new regulatory regime requires banks to hold more capital in times of excessive credit growth to cushion against losses in down times. It also involves more stringent liquidity risk management standards and supervisory monitoring as well as enhanced disclosure on remuneration practices and off-balance sheet exposures. In the event that regulatory models eventually fail to mitigate key risks and a crisis occurs, regulatory authorities are required to ensure immediate remedial measures *(crisis containment policies)* and then work out a medium to long-term plan to resolve the crisis *(crisis resolution policies)*. These later concepts were, however, examined in chapter 6 under micro-prudential regulation and stakeholder protection.

Chapter 5 examined the distinction between the micro- and macro-prudential dimensions of financial stability. The *micro-prudential dimension* involves the likelihood of failure of an individual financial institution and the associated risk spillovers, while the *macro-prudential dimension* seeks to minimise the likelihood of failure of a significant proportion of the financial system, and the associated costs. This study was also able to identify the areas of *complementarities* and *tensions* arising between the two approaches to financial stability.

Chapter 6 discussed the tools of micro-prudential regulation and their role in protecting stakeholders such as depositors and investors. The main elements of microprudential regulation are risk-based supervision, deposit insurance and financial consumer protection. Risk based supervision (RBS) allows supervisors to allocate resources to the banks with the greatest risk and areas within individual bank that are high risk. RBS also allows supervisors to examine the business model of the supervised entity to ascertain possible risks inherent in the bank's strategy. One major task in conducting risk-based supervision is to assess the financial condition or health of individual financial institutions and rate the organisation's financial strength according to the institution's ability to support the level of risk associated with its activities. The CAMELS rating system is often used by bank examiners in the US and many other jurisdictions, though with some variation.

With respect to deposit insurance, this paper discussed the costs and benefits of deposit insurance schemes. A major finding is that there has to be a trade-off between the rationale for the establishment of deposit insurance and the costs. Effective deposit insurance system can be a veritable instrument in the promotion of public confidence and the stability of the financial system. The deposit insurance systems were one of the policy tools that were used by various governments to prevent the financial and payments system from collapsing during the recent 2007-08 financial crisis. However, deposit insurance often leads to excessive risk taking on the part of banks, free riding by depositors and lack of monitoring by creditors. Thus, to establish an effective deposit insurance system, a number of measures that are necessary for the system to be credible and sustainable should be put in place.

A similar objective of microprudential regulation is the protection of financial consumers in general. This involves establishing what kind of protection is necessary, the responsibility that consumers have in protecting themselves and what the authorities can do in the area of empowering consumers, particularly those who are vulnerable to the opportunistic tendencies of financial institutions. Empowering consumers by improving their financial capability is often done through consumer education; by making more information available (both generic information, and information provided in the course of financial services transactions); and by making products easier to understand or by improving access to financial advice. Another aspect is strengthening product regulation to encourage the creation and marketing of only 'safe' and 'simple' products, which will either reduce or eliminate the need for consumers to resort to, sometimes, costly financial advisory services.

In view of the need for a market-wide perspective of risks, the concerns over financial innovation and concerns over the pro-cyclicality of the financial system, it can be argued that a shift towards a more macro-prudential focused policy regime is the new road to financial stability.

Chapter 7 focused on the tasks and tools of macro-prudential regulation in achieving financial stability. It can be argued that strengthening the macro-prudential aspect could achieve both the micro and macro-prudential objectives of financial stability, that is, engender the protection of consumers and depositors' funds and at the same time achieve system-wide stability. To be able to do this effectively, the macro-prudential regulator is faced with two daunting tasks: *monitoring financial vulnerabilities* and *calibrating policy tools to mitigate identified risks*. Monitoring financial vulnerabilities can be done using macro-prudential indicators, which serve as early warning signals or predictors of crisis vulnerabilities. In recent times, macro-stress tests have also been used in the manner in which micro-stress tests are done.

In mitigating systemic vulnerabilities, it is important to understand the nature of financial instability. Financial instability stems from two dimensions: *the cross sectional dimension* and *the time dimension*. The cross-sectional dimension of macro-prudential regulation seeks to reduce the risk spill overs from the failure of individually systemic institutions. So, the macro-prudential supervisor should be able to effectively classify institutions according to their systemic importance. Generally, two classes of systemically important banks exist: *collectively systemic* and *individually systemic* institutions. The systemic importance of institutions can be identified by considering their *size*, *interconnectedness* with other institutions, the degree of *substitutability* of their products and services, the value of their *cross-jurisdictional activities* and the *complexity* of their operations. It is recognised that systemic risk can also arise from the aggregate weakness of the financial system where institutions that have correlated exposures face a common shock that undermines a significant proportion of the system with adverse macro-economic implications. This is the time-dimension or the *pro-cyclicality* of the financial system. Several tools have been developed to address the time dimension of financial stability. Prominent ones are *dynamic capital buffers, higher quality capital, and contingent capital.* Others include *loan to value ratios, liquidity risk management* and *levy on wholesale funding*, amongst other tools, which seek to constrain the vulnerabilities in the financial system.

Chapter 8 focused on examining the issues and challenges in implementing prudential regulation. Although macro-prudential analysis complements the work of micro-prudential supervision, if both tasks of prudential supervision are vested in one single agent, it may create conflicts in their execution. This is because micro-prudential policies achieve short run objectives and hence, their enforcement may be time-inconsistent with long-run macro-prudential objectives. There is thus, a short-run trade-off between the enforcement of micro-prudential policies and their long-run macro-prudential counterparts. In addition, the governance of macro-prudential policies does not come without challenges. There is first a need to give *adequate powers* to macro-prudential supervisors to constrain systemic risks arising from an ever innovative and evolving financial sector. These powers relate to *information collection powers, powers to designate institutions* in line with their degree of systemic significance, and *powers to make rules and calibrate policy tools*. Another challenge is *the need for policy coordination* between the macro-prudential authority and other stakeholders within and outside the direct purview of the formal financial system whose activities or policies could pose systemic risk to the financial system. The relationship between monetary and financial policy in particular plays a crucial role in the design and implementation of effective macro-prudential policy.

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Appendix I: Timeline for the Implementation of Basel III

	2013	2014	2015	2016	2017	2018	2019
Minimum Common Equity Capital ratio	Gradual implementation 3.5%	Gradual implementation 4.0%	Final implementation 4.5%	4.5%	4.5%	4.5%	4.5%
Minimum Tier 1 Capital	Gradual implementation 4.5%	Gradual implementation 5.5%	Final implementation 6.0%	6.0%	6.0%	6.0%	6.0%
Minimum Total Capital Requirement	Final implementation 8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Capital Conservation buffer				Gradual implementation 0.625%	Gradual implementation 1.25%	Gradual implementation 1.875%	Final Implementation 2.50%
Phasing in of new deductions from capital base		Gradual implementation 20%	Gradual implementation 40%	Gradual implementation 60%	Gradual implementation 80%	Final Implementation 100%	100%
Leverage ratio	Observation	Observation	Disclosure starts			Migration to pillar I	
Minimum Total Capital plus capital conservation buffer	8.0%	8.0%	8.0%	Gradual implementation 8.625%	Gradual implementation 9.25%	Gradual implementation 9.875%	Final Implementation 10.5%
Liquidity Coverage ratio	Observation	Observation	Introduce minimum standard				
Net stable funding ratio	Observation	Observation	Observation	Observation	Observation	Final implementation	

Source: BCBS (2010c)

Mindset Resource Consulting
2nd Floor, Clyde Offices
48 West George Street,
Glasgow, G2 1BP
United Kingdom

info@mindsetrc.co.uk
www.mindsetrc.co.uk
www.linkedin/company/mindset-resource-consulting

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