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Macro-Financial Linkages: Implications or Monetary and Financial System Stability

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Abstract

Monetary and financial stability are of central importance to the effective functioning of a market economy. They provide the basis for rational decision-making about the allocation of resources through time and therefore, improve the climate for savings and investment. The absence of stability creates damaging uncertainties that could lead to misallocation of resources and reduce the willingness to enter into inter-temporal contracts. In extreme cases, disruptions in the financial sector can have severe adverse effects on economic activity. Thus, maintaining stability is a key objective of monetary authorities.

In this paper, the implications of macro-financial linkages for monetary and financial system stability were examined. Based on the flow of income model and the contingent claim analysis (CCA) framework, the paper established major linkages among the four sectors of the economy. These linkages, which are built on the contingent claims of each sector on the other, create the economic balance sheet of the sectors, demonstrating the interdependence among the sectors. Based on these structures and linkages, the vulnerability and excess build-up in the financial sector and institutions could affect the wider economy, with some devastating impacts. By the same token, the health of the financial sector could be severely tested by the developments in the economy. These two way macro-financial linkages create potentially dangerous mechanism that could trigger deep and long-lasting economic downturns without rapid and effective policy intervention. The paper recommends the adoption of macro-prudential policy to address systemic risks generated by macro-financial linkages. The paper also recommends that financial institutions should be prevented from becoming too connected to fail.

Keywords: Monetary Policy, Financial Stability, Macro-financial linkages, Monetary policy transmission channels, Micro-prudential policy, Macro-prudential policy, Systemic risk, Interconnectedness.

I. Introduction

Analysis of macro-financial linkages provides a powerful framework for analysing risk and vulnerability in economies and for estimating the economic value of the risks posed by inter-linkages between sectors, as well

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as the risk of default of different sectors and markets, and the real economy on their outstanding debt obligations. Thus, an understanding of the linkages between the financial sector and the macro-economy, and the mechanisms through which financial regulation can help to stabilise the economic and financial system by financial policy makers will facilitate the effective formulation, design and implementation of financial stability and monetary policies.

In the last few years, efforts to review monetary and financial stability policies have focused attention on the interaction between the financial system and the macro-economy. The 2007-2008 global financial crisis demonstrated that the weaknesses in the financial system could have sudden and long-lasting macroeconomic effects.
This paper therefore focuses on the following objectives:

To understand the components of the financial system and the macro-economy, and how they interact and influence the overall behaviour of the economy, including all intermediaries, markets and infrastructures underpinning them;

To gain a truly systemic perspective of the financial system, including large and complex financial institutions;

To understand the likelihood of the failure, and the costs, of a significant portion of the financial system arising from systemic risks; and

To understand how important the individual viability and the multiple connections of large and complex financial institutions to other intermediaries and markets are for systemic stability, and therefore, for macro-prudential risk assessments and policies.

This paper is structured into two parts. Section I discuss the structure of the macro-economy and the financial industry, and the interactions between monetary policy and the financial system. The section also showed how monetary policy could create the condition for financial stability.

Section 2, on the other hand, discuss the implications of macro-financial linkages for monetary and financial system stability with emphasis on how the new credit risk transfer mechanism (securitisation and derivatives) had altered the nature of some macro-financial linkages, with considerable policy implications. The section concluded by referring to the new direction of macro-prudential regulation and the tools for managing risks created by macro-financial linkages. Reference was also made to the recent subprime financial crisis that started in the US economy with lessons for emerging market economies, such as Nigeria.

I.1 Why Macro-financial Linkages?

Macro-financial linkages, as the term implies, refer to the interaction between the financial sector and the macro-economy. These linkages exist in the form of mechanisms that transmit the impact of macroeconomic activities to the financial sector and vice versa. It is known that vulnerabilities and excess build-up in financial markets and institutions can affect the wider economy, with sometimes devastating results. By the same token, the health of the financial sector can be severely tested by developments elsewhere in the economy. In fact, these two-way macro-financial linkages often create potentially dangerous feedback mechanisms that trigger long lasting economic downturns without rapid and effective policy intervention.

Financial market activities and transactions create reasonable amount of risks to the economy. Whereas the risk-taking behaviour of the participants drives the market performance, the risks become issues when they lead to excesses. Despite the high level of regulation of the financial system, there is still a lot to learn about the behaviour of financial institutions and their effects on systemic risks and the real economy. The ability to model the channels by which disruptions in credit and finance affect the real economy and the ways these effects transmit into the banking and financial system has become very sophisticated. Yet, our understanding of the key channels, their quantitative importance and the effects of policies for managing them, remain very important.

The overall objective of macro-financial linkage analysis is to analyse the impact of shocks, both domestic and external, on the macro-economy, using a framework based on the analysis of risk-adjusted and interlinked balance sheets of the major economic sectors. The framework measures non-linear risk transmission between the domestic economy and the global economy.

II. Structure of the Macro-economy and the Financial System.

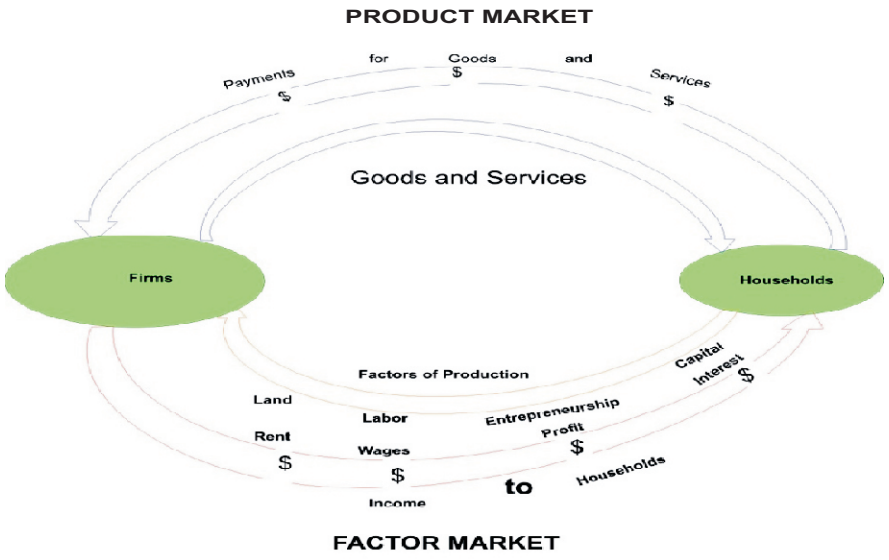
A healthy and vibrant economy requires a dynamic financial system that moves funds from people who save to people who have productive investment opportunities. The financial system is structured as part of the macro-economy so as to promote economic efficiency. Financial systems are fragile and vulnerable to crisis. When a country's financial system collapses, its economy goes with it. In particular, when government oversight fails, the cost can be enormous.

One basic way to visualise the macro-financial linkages is to consider the circular flow of income model in Figures 1-4. Figure 1 shows the circular flow of income and product with a credit market, government, and a foreign sector. Households supply

factors of production (land, labor, capital, and entrepreneurship) to businesses (firms), and purchase goods and services from the firms. Firms buy these factors of production and supply goods and services. In the product market, goods are exchanged; and in the factor market, factors of production (resources) are exchanged.

The factor market shows the flow of incomes received by households in the form of rent, wages, interest and profit, for the use of the four factors of production. The product market shows the flow of goods and services produced. The credit market allows savings (non-consumptions) by households to be converted into investment funds for firms. These investment funds are then spent on goods and services produced by firms. The government buys goods and services produced by firms and also buy factors of production from households by paying rent, interest, wage and profits. In addition, government reduces households' consumption by taxing the incomes of households. If government spends more than its taxes, thereby running a deficit, it must borrow the needed funds from the credit markets. Thus, government enters the circular flow of income and product model at a number of points. It takes funds out of the stream by taxing households and by borrowing from credit markets. It adds to the flow by purchasing goods and services from firms (see Figure 3).

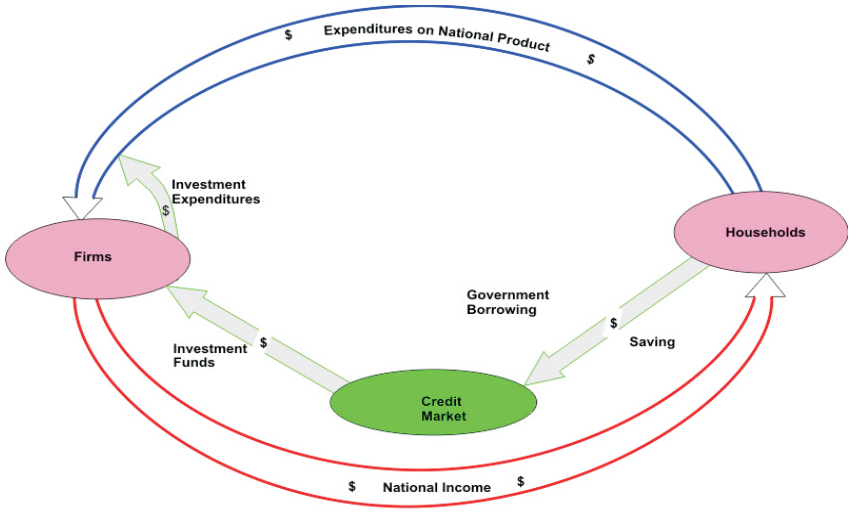
Figure 1: Circular Flow of Income and Product



Source: Amacher and Ulbrich, 1986.

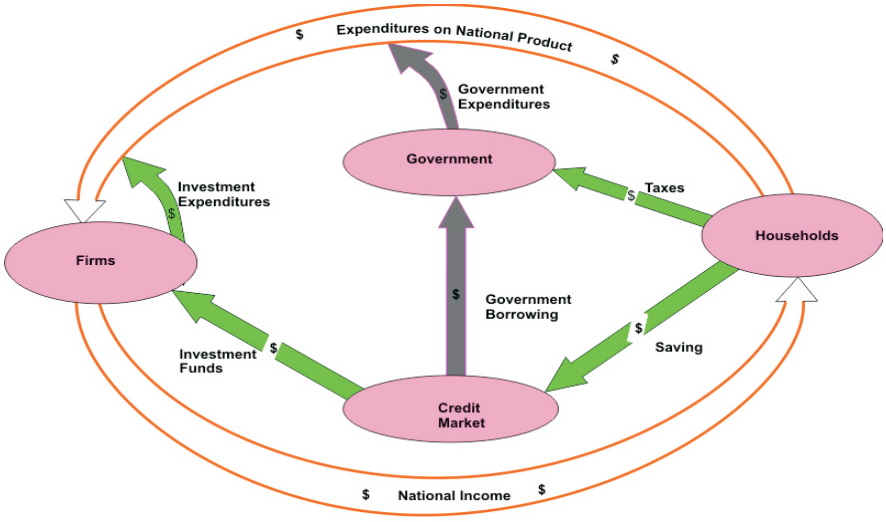
The last sector in the model is the foreign sector (Figure 4). A foreign sector allows the households to purchase from, and sell goods and services to, firms outside the country. The purchases from foreign firms are called imports, while goods and services sold to foreign buyers are called exports. As evident in Figure 1, the circular flow of income model of the aggregate economy emphasises output and income and their components.

Figure 2: Circular Flow of Funds with a Credit Market



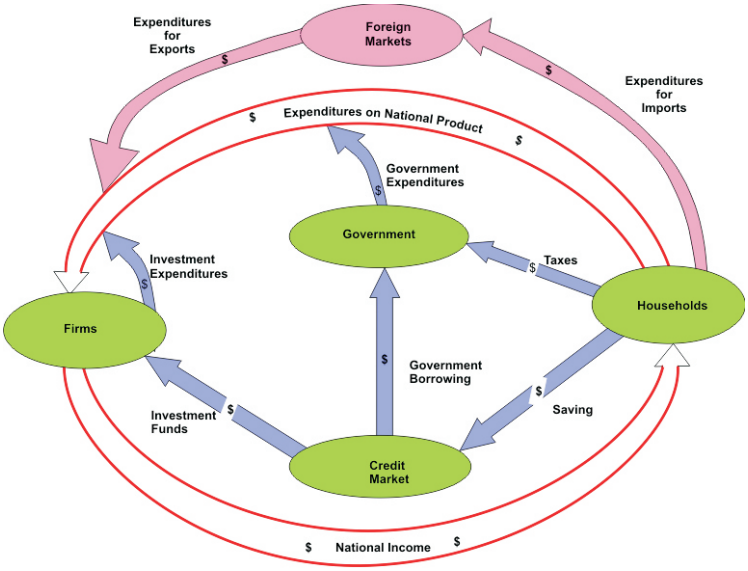
Source: Amacher and Ulbrich, 1986.

Figure 3: Circular Flow of Income and Product with a Credit Market and Government



Source: Amacher and Ulbrich, 1986.

Figure 4: Circular Flow of Funds with Government and a Foreign Sector



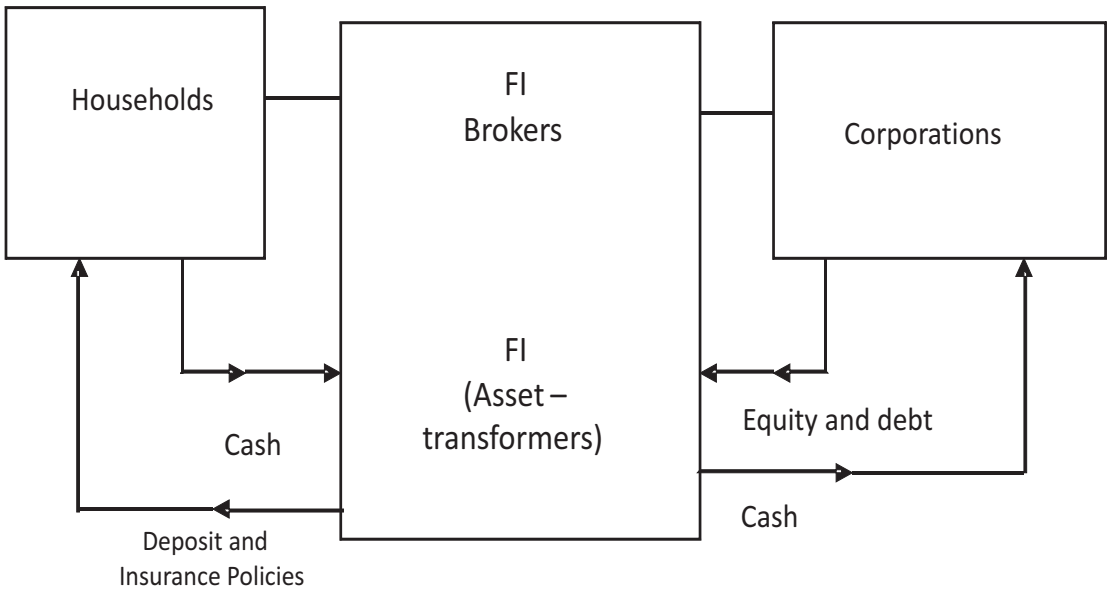
Source: Amacher and Ulbrich, 1986.

II.1 The Role of the Financial Market (Credit Market)

Financial institutions (FIs) perform special function or services to the economy. Any major disturbances to, or interferences with, these functions can lead to adverse effects on the rest of the economy. Financial institutions fulfill two basic functions, namely, brokerage and asset-transformation. In the brokerage function, a FI acts as an agent for the savers in providing information and transaction services. By this service, the FI plays an extremely important role by reducing transaction and information costs or imperfections between households and corporation. In asset-transformation, FIs purchase the financial claims issued by corporations' equities, bonds, and other debt claims called primary securities –and finance these purchases by selling financial claims to households' investors and other sectors in the form of deposits, insurance policies, and so on. The financial claims of FIs may be considered secondary securities because these assets are backed by the primary securities issued by commercial corporations that in turn invest in real assets (see figure 5)

The financial claims issued by FIs are more attractive than the ones used by corporation due to lower monitoring costs, lower liquidity costs and lower price risk.

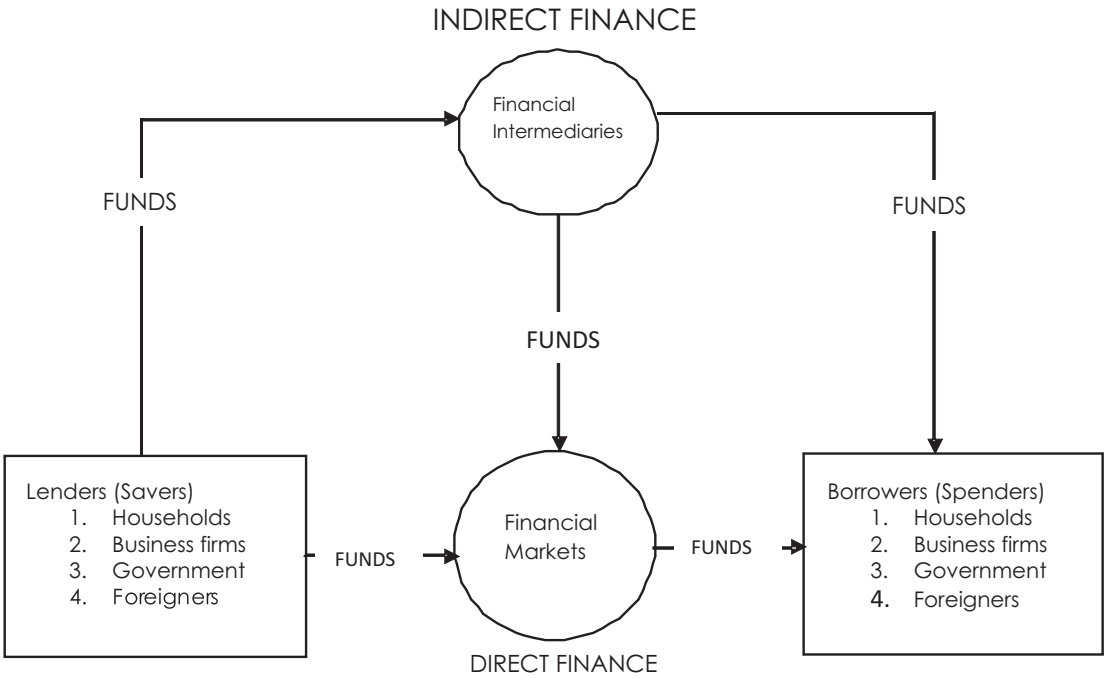
Figure 5: Flow of Funds in a world with Financial Institutions



Source: Saunders A., 1997.

By playing these roles, FIs contribute to higher production and efficiency in the overall economy. Figure 6 shows the two major processes by which funds are channeled from savers to those who have productive investment opportunities. Funds can flow from the savers direct to the users under direct finance channel when savers benefit directly in corporate sector investments. But when funds flow from the savers to the users through the financial intermediaries (a process called financial intermediation), it is said to be done through an indirect finance channel.

Figure 6: Flow of Funds through the Financial System



Source: Frederic S. Mishkin, 1992.

II.2 Linkages in a Simple Four-Sector Framework

From the four-sector macro-finance model (flow of income model) shown in figures 1-4, we can define the contingent claim in each sector that demonstrates the interdependence among sectors. As we noted, the corporate sector borrows from banks (financial market) through loans and other forms of credits. The bank loans are the liabilities of the corporate sector, which are the assets of the banking sector. The banking sector also includes guarantees from the government as an asset, which is a liability to the government. The system's financial stability depends on the government's financial guarantee to the banks. The corporate sectors liability includes primary securities such as equity. The banking sector liabilities include deposits and equity. The assets of the household sector are made up of real estate and durables, present value of labour income and financial assets, which are liabilities to the banking sector. Household liabilities include real estate debts (mortgages which are borrowed from the banks), consumption as "dividend" and net worth. The assets of the government (public sector) include foreign reserves, net fiscal asset and value of monopoly on issue of money. The liabilities of the public

sector include financial guarantee, foreign debt and base money and local currency debt.

These linkages built on the contingent claims of each sector on the other create the economic balance sheet of the sectors, which demonstrates the interdependence among sectors. The patterns of value and default corrections across different asset classes, sectors and foreign debt values depend on these structures and links, unique to a particular economy.

Table 1:Balance Sheet of a Simple Four-sector Framework

Corporate sector balance sheet	
Asset	Liabilities
Corporate assets	Debt (=Default -free value of debt minus implicit put option) Equity (implicit call option)
Banking sector balance sheet	
Assets	Liabilities
Loans (debt of corporate sector)	Debt
Other assets	Deposits
Financial guarantee (implicit put option)	Equity (implicit call option)
Household sector balance sheet	
Assets	Liabilities
Real estate and durables	Debt (real estate and durables)
Financial assets	Consumption as "dividend"
Present value (PV) of labour income	Net worth of households
Public sector balance sheet	
Assets	Liabilities
Foreign reserves	Financial guarantee (implicit put option)
Net fiscal asset and other assets	Foreign debt (default - free value of debt minus implicit put option)
Value of monopoly on issue of money	Base money and local currency debt (implicit call options)

Source: Gray and Malone, 2008.

II.3 Risk Transmission among Sectors

We can use the four-sector framework to explain how the risks inherent in the interactions between the sectors can be transmitted from one sector to the other. The framework can also be used to show how the risk-transmission patterns can be dampened or magnified depending on the capital structure of the sectors and the linkages. When shocks affect the corporate sector, for example, the shocks feed into

the financial sector and could transmit risk to the government. These are explained in the sections below.

II.3.1 Risk Transmission from the Corporate Sector to the Banking Sector and to the Government

The corporate sector's financial distress – possibly caused by stock market declines which reduce the value of corporate assets, recession, commodity prices drops, or excessive unhedged foreign debt accompanied by currency devaluation – can be transmitted to the financial sector.

Corporate sector ⟶ Banking sector ⟶ Government

The four-sector framework shows how the risk can be transmitted from the corporate sector to the banking sector and to the public sector through implicit and explicit guarantees. An example of a negative shock to the corporate sector is a drop in the assets as a result of recession; equity sell-offs; the combination of currency devaluation; and foreign debt that is not hedged. The value of the assets of the corporate sector declines. So does the value of the debt (and equity), which leads to a decline in bank assets and an increase in the implicit government guarantee. As the corporate assets decline, the government guarantees to the banking sector increase in a nonlinear way.

II.3.2 Risk Transmission from Banking Sector to the Government

The banking sector's financial distress, such as systemic banking crisis, due to deposit runs and a decline in asset value or mismanagement can be transmitted to the government through guarantees.

Banking sector ⟶ Government

Risk in the banking sector due to financial distress (e.g. from bad loans, deposit run or mismanagement) means that the banking sector's implicit put option rises and this could lead to large increase in the implicit guarantee provided for the government. In the case of a systemic banking crisis, the government is most likely to provide guarantees. The cost of such crises to the government can be quite large, up to 30-50% of GDP in extreme cases.

II.3.3 Risk transmission from the Government to the Banks and Feedback

The public sector's financial distress or default can transmit risk to the financial system. When the banking sector is holding a significant proportion of government securities, and there is a negative shock to the government financial position, it can have a detrimental impact on the banks. The government's implicit guarantee is also likely to increase. This, in turn, makes the government's financial position worse, creating a compounding effect, which may result in the government's failure to honour its guarantee obligations and cause a collapse of the banking system.

Banking/Financial system ⟶ Government

The impact of decline in government assets results in lower value of sovereign debt in the case where there is a sharp decline in government assets relative to its distress barriers. If the banking sector were to have a large portion of its assets in government debt, a vicious circle could arise, when the lower value of government securities lowers bank assets, and raises the implicit financial guarantee, which in turn, lowers government assets further. In some situations, this vicious circle can spiral out of control, eventually resulting in the inability of the government to provide sufficient guarantees to banks, and leading to a systemic financial crisis.

II.3.4 Risk Transmission from the Pension System to the Government

The financial distress related to pension plans can result in the transmission of risk to the government.

Pension ⟶ Government

One example is the case when a pension system's assets contain corporate sector equity (in a defined benefit plan, which has an implicit government guarantee). A decline in corporate assets would cause the corporate equity value to drop. This, in turn, would increase the government guarantee to the pension system and the implicit guarantee to banks.

II.3.5 Risk Transmission from the Public Sector to Holders of public Sector Debt

Fiscal, banking, and other problems can cause distress for the government, which can transmit risk to holders of government debt.

Public sector⟶ Debt holders

Holders of foreign currency debt have a claim on the value of the debt minus the potential credit loss, which is dependent on the level of assets of the public sector (in foreign currency terms) compared to the foreign currency default barrier.

II.4 Financial Market Components and Interrelationships

II.4.1 Components of Financial Markets

Financial markets bring participants together, discover prices, facilitate exchanges and disseminate information regarding products and prices. Accordingly, markets are communication networks among participants. As networks, they are constantly evolving to find more efficient ways to accomplish their functions. What causes these networks to be formed and constantly modified is the profit motive of participants.

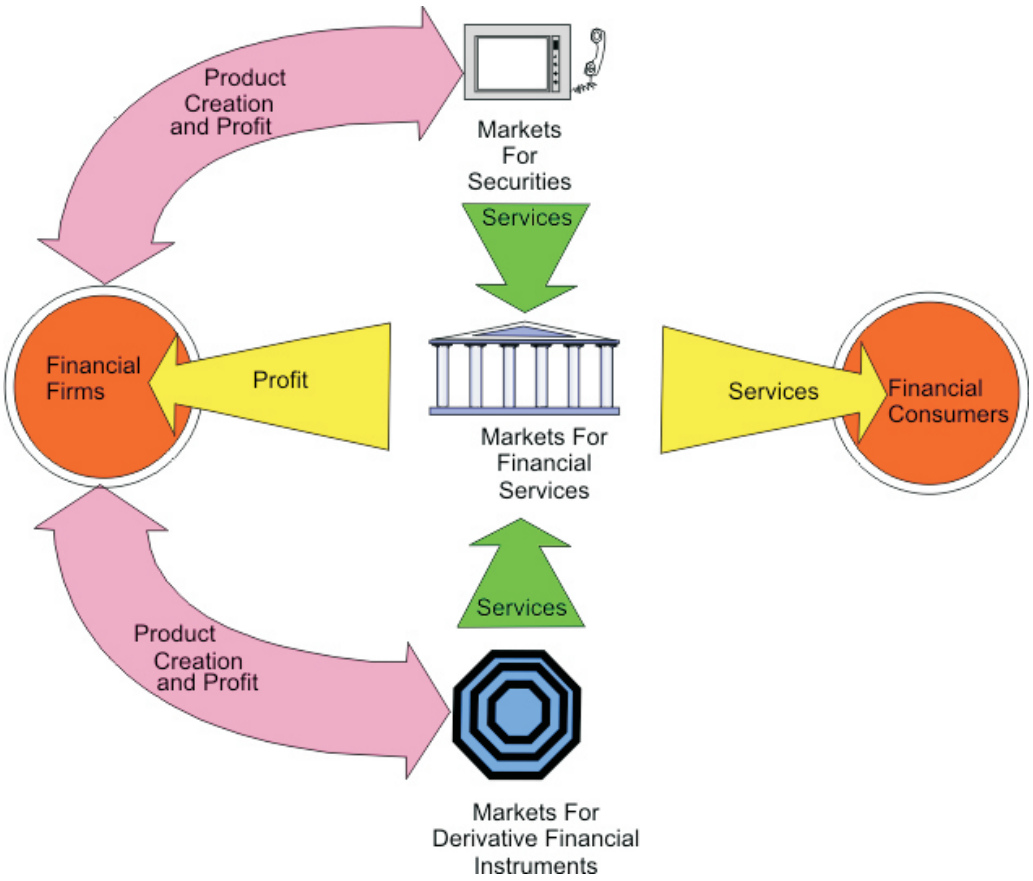
The organisational structure of financial markets is made up of three categories, namely; the markets for financial services, the markets for securities and the markets for derivatives financial infrastructures. This categorisation is based on three major needs for financial markets – the need for financial services such as funding and making payments, the need for liquidity and the need for risk management. All these major categories and their components operate together in what is called the Financial System. Financial markets, therefore, are a system of interconnected, yet differentiated markets as described below:

Markets for financial services are the "product" markets in finance. Institutions and firms in these markets identify the needs of consumers and offer the appropriate products. These services assist with borrowing, lending, investing, making payments, and managing financial risks. Interaction between firms and consumers determines the types of services offered and set their prices.

Markets for securities are the "exchange" markets in finance. Securities are negotiable financial instruments such as stocks and bonds, which may be exchanged among investors. Trading in securities markets sets the market prices and expected yields of securities, and indirectly, the yields on non-negotiable financial instruments such as bank loans and non-negotiable bank deposits.

Markets for derivative financial instruments are the "risk management" markets in finance. Derivative instruments include financial futures and options contracts, and other related risk management contracts. These contracts are termed derivative instruments because their existence and value derives from some underlying security, like a U.S. Treasury bond. Derivative instruments are not themselves securities, but simply contracts to exchange securities assist in managing the risk of unexpected changes in the future price of securities. The markets for derivative financial instruments create and exchange positions in these instruments and set their prices.

Figure 7: Financial Market Components and Interrelationships



Source: William Scott- 1991.

II.4.2 Interrelationships among Financial Markets

The markets for financial services are the controlling forces among the three market components (see figure 7). In the "product" markets, firms offer financial services to consumers for a profit. This sets up the interaction among the three component markets.

Financial services firms use securities markets to create services for consumers and earn profit from dealing in these markets. They establish and maintain organised exchanges and trading networks in order to offer their customers access to open market financing (securities issues) and trading in securities (securities brokerage). Financial services firms also use securities markets for their own profit. For instance,

banks acquire bonds in securities markets, which they hold as earning assets, and securities firms trade in securities markets to earn profit as principals.

Financial services firms use derivative markets to create services for their customers and earn further profits. They have input into the creation of new types of financial futures and options contracts and so help their clients who trade on futures and option exchanges. Some financial services firms use derivatives markets to earn profits. For example, securities firms use computerised trading schemes to gain riskless profits from positions in both derivative and securities markets.

II.4.3 Economic Functions of Financial Markets

Financial markets are different from most other types of markets, since they have macroeconomic as well as microeconomic functions. Most real goods and services markets have principally microeconomic functions: producing, pricing, and distributing goods and services. Financial markets have macroeconomic functions as well as microeconomic functions. These markets create nation's money supply, set interest rates in the economy, and evoke financial flows that determine the course of economic growth. As a result, dealing in financial markets can become challenging and perplexing. Dealing in other types of markets, for example, does not involve outguessing the current monetary policy of the CBN and the interest rate and foreign exchange policies of central banks in other jurisdictions.

II.4.3.1 Microeconomic Functions

Microeconomics refers to the economic forces that bring about the production and exchange of goods and services, and set their prices. The microeconomic functions of financial markets include producing financial services and facilitating financial flows.

Producing Financial Services: Like goods and services markets, financial markets produce and sell services that serve the needs of the economy. These services are largely associated with borrowing, investing, managing risks, and making payments and financial transactions.

Facilitating Financial Flows: Through offering services, financial markets are able to gather and package the savings of individuals and groups in society and transfer these funds to profitable business ventures and socially beneficial public investments. Interest rates and security prices serve as signals that cause financial markets to allocate savings for their most productive use in the economy.

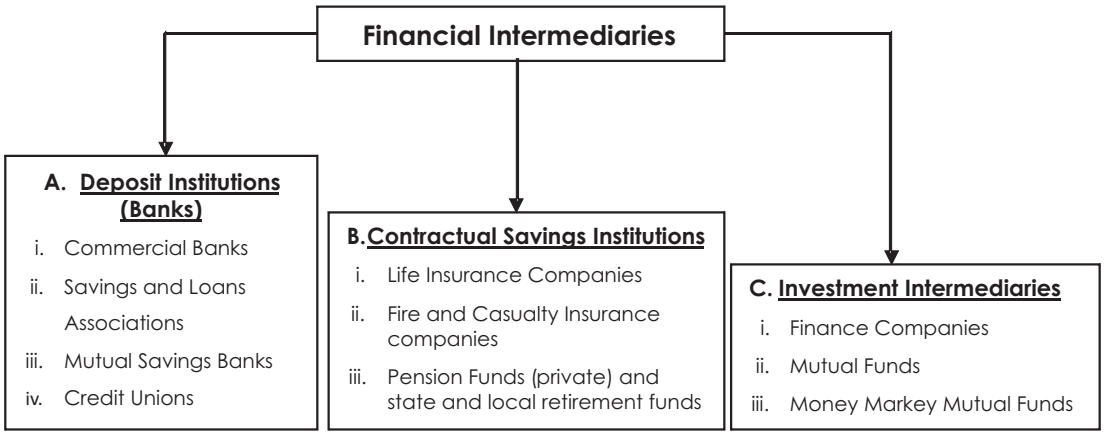
II.4.3.2 Macroeconomic Functions

Macroeconomics refers to the economic forces that affect national income, employment, prices and productive capacity. The macroeconomic functions of financial markets are to create money and financial capital.

Creating Money: Banks and other depository institutions operating in financial markets create transactable deposits that serve as money. Instead of tendering cash for payments, depositors may issue cheques on their accounts in depository institutions. The payments system involves interrelationships among depository institutions that clear cheques and move funds from those who pay to those who receive. Payments services are the means that depository institutions use to help their customers make payments, such as cashier's cheques, electronic transactions, and so on. Being paper or magnetic entries in computer systems, deposits can be freely created to meet the monetary needs of the economy. The rate at which money is created directly influences the macroeconomic performance of the economy. Therefore, central banks are empowered to control the money-creating ability of the banking system.

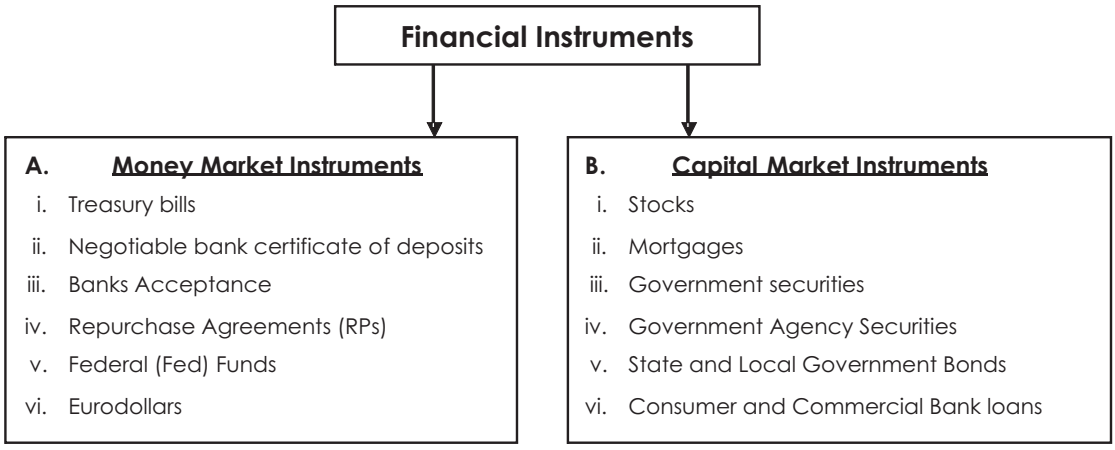
Creating Financial Capital: A nation must create real capital to experience economic growth and increase the standard of living of its citizens. Real capital is defined to include productive real assets such as machinery, plant, equipment, real estate, and direct ownership of physical business assets. Real capital allows efficient production and saves the time and effort of both employees and management. By possessing current technology, real capital is responsible for the increased production of goods and services. Business invests in real capital to gain returns from selling the goods and services that are efficiently produced and made available to consumers. Financial markets create financial capital to assist the development of real capital. Financial capital is simply financial instruments that provide investors with an indirect means to share in the returns generated by real capital. For example, when an automobile plant makes money from manufacturing and selling cars, this return can be passed on to investors in the form of bond interest and dividends on common stocks (e.g., returns on financial instruments). Investors need not directly own the car plant, and instead may own a claim upon its cash returns.

Figure 8: Financial Intermediaries



Ownership of financial paper presents investors with more flexibility than ownership of real capital. Financial instruments can be divided into small-denomination units, which can be easily transferred and sold; structured to manage risk in accordance with investors' needs; and have other attributes that make the instruments more attractive. Accordingly, the creation of financial capital encourages saving and investing and facilitates the formation of real capital in modern economics. Financial instruments allow investors to own a part of an enterprise for as long as they desire. For example, it is not necessary to own the whole car plant forever, to gain the returns it generates for owners.

Figure 9: Financial Instruments



II.5 Monetary Policy and the Financial Markets: The Transmission Mechanism

Monetary policy is the act of increasing or decreasing the nation's money stock to influence the national economy. Monetary policy is implemented in an effort to achieve specific goals for the nation. The policy operates by having central banks employ financial tools, which have direct effect on the financial markets. Therefore, participants in the financial markets seek to formulate financial strategies that anticipate the outcomes of monetary policy on financial markets.

The transmission mechanism is the channel of monetary influence on economic activity and is used for policy analysis by central banks. The transmission mechanisms (channels) fall into three categories: namely, those operating through investment spending, through consumer expenditure, and through international trade. (see figure 10)

i. **Investment Spending:** According to Modigliani (1998), interest rate may not be the only driving factor for investment spending. The model discovered other factors such as credit rationing, prices of common stocks and net worth of firms.

a. **Credit Rationing:** When monetary policy is restrictive, bankers might start to ration loans to their customers instead of allowing the interest rate on these loans to rise, that is, they would not make loans available at the stated interest rate. An expansionary monetary policy might then increase the quantity of available loans, causing investment spending to rise, even though interest rates do not have much of a measurable decline systematically, the monetary policy effects is:

$$Money\ (M) \qquad \text{Loans} \qquad \text{Investment (I)} \qquad Income\ (\text{Y})$$

b. **Monetary Policy** can also affect investment spending through its effects on the prices of common stock. Tobin (1969) developed a theory of the link between stock prices and investment spending, referred to as Tobins q theory. Tobin defines q as follows:

$$q \quad \frac{\text{Market Value of Firms}}{\text{Replacement Cost of Capital}}$$

If q is high, the market price of firms is high relative to the replacement cost of capital, and new plant and equipment capital is cheap relative to the market value of business of firm. Companies can then issue stock and get a high price for it relative to

the cost of the plant and equipment they are buying. Thus, investment spending will rise because firms can buy a lot of new investment goods with only small issue of stock. The reverse is the case when q is low. The implication of this is that when money supply increases, the public finds it has more money than it wants and so gets rid of it through spending. One place the public spends is in the stock market, increasing the demand for stocks and consequently raises their prices. Combining this with the fact that higher stock prices (Ps) will lead to a higher q and thus higher investment spending (I) lead to the following transmission mechanism of the monetary policy:

$$M \qquad Ps \qquad q \qquad I \qquad Y$$

c. **Networth Firms:** The higher the networth of firms, the less severe are adverse selection and moral hazard problems. Higher networth means that lenders in effect have more collateral for their loans, and so losses from adverse selection are reduced. A rise in networth which reduces the adverse selection problem, thus encourages lending to finance investment spending. A rise in stock prices raises the networth of firms and so leads to higher investment spending because of the reduction in adverse selection and moral hazard problems. Thus

$$M \qquad Ps \qquad Adverse\ Selection \& Moral\ Hazard \qquad Loans \qquad I \qquad Y$$

ii. **Consumer Expenditure:** The link between monetary policy and consumer expenditure are divided in three areas: interest rate effect on consumer durable expenditure, wealth effects and liquidity effects:

a. **Interest rate effects on consumer durable expenditure:** The lower interest rates, which lower the cost of financing these expenditures would encourage consumers to increase their consumption of durable goods. The resulting channel of monetary policy influence on aggregate demand is as follows:

$$M \qquad I \qquad \text{Consumer durable expenditure} \qquad Y$$

b. **Financial Wealth Effects:** This considers how the balance sheet of a consumer might affect his spending decisions. An important component of a consumers lifetime resources, which determine his consumption spending is his financial wealth, a major component of which is common stocks. When stock prices rise, the value of financial wealth increases, thus increasing the lifetime resources of consumers and consumption. Thus, the monetary transmission mechanism is as follows:

$$M \qquad Ps \qquad Wealth \qquad Life\ time\ resources \qquad Consumption \qquad Y$$

c. **Liquidity Effects:** When consumers have a lot of financial assets relative to their debts (which implies highly liquid balance sheet), their estimate of the possibility of financial distress is low, and they will be more willing to purchase consumer durables. Thus, when stock prices rise, the value of financial assets rise as well, consumer durable expenditure will also rise which leads to the following transmission mechanism for monetary policy:

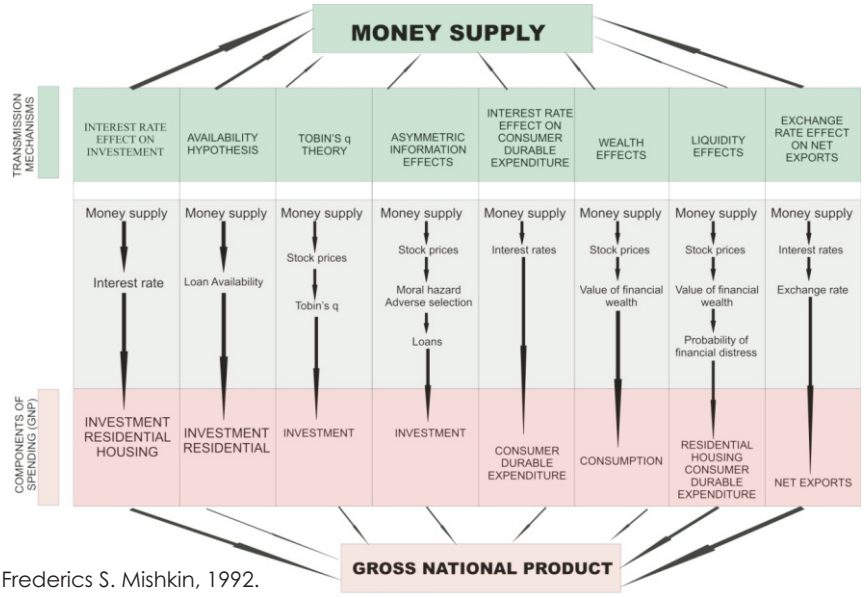
$$M \quad Ps \quad \textit{Value of Financial Assets} \quad \textit{Likelihood of Financial Distress}$$
$$\textit{Consumer Durable Expenditure} \quad Y$$

iii. **International Trade:** With the growing internationalisation of the economy and the advent of flexible exchange rate, an exchange rate effect on net experts has become an important monetary transmission mechanism.

When domestic interest rates fall (with inflation unchanged), domestic savings (deposits) become less attractive relative to deposits denominated in foreign currencies. The result is a fall in the value of dollar deposits relative to other currency deposits, that is, a fall in the exchange rate (denoted by E). The lower value of the domestic currency makes domestic goods cheaper than foreign goods thereby causing a rise in net exports and hence in aggregate output. The monetary transmission mechanism operating through international trade is thus

$$M \quad I \quad E \quad NX \quad Y$$

Figure 11: The Link between Money and GNP - Monetary Transmission Mechanisms



Source: Frederics S. Mishkin, 1992.

II.7 Interactions between Monetary Policy and the Financial System

Monetary policy is the act of increasing or decreasing the nation's money supply to move the economy towards growth and stable places. The CBN, which is the principal regulator of the nation's money supply, utilises financial markets to conduct monetary policy. When the Bank conducts monetary policy, it influences the behavior of depository financial institutions operating in the market, financial services, as well as interest rates and the value of financial instruments. Thus, monetary policy decisions can influence the financial sector by influencing the risk-taking behavior of financial sector participants. Monetary policy can affect such behavior in three ways: (i) by affecting the overall level of leverage in the economy. (ii) by affecting the maturity structure of financial liabilities and (iii) by changing attitudes held by those in the financial sector about assuming risk.

A monetary policy designed to reduce growth in the money supply has a direct effect on financial markets. With less money (which implies less credit), interest rates rise and security prices fall in secondary markets. Therefore, a restrictive monetary policy has the potential to reduce availability of funds in credit markets and increase borrowing costs, decrease the value of investment portfolios, raise the interest cost of liabilities (deposits) of financial institutions if asset yields are more sensitive to changing market rates than liability costs or decrease the lending spreads of financial institutions. If asset yields are less sensitive to changing market rates than are liability costs, and reduces the liquidity of financial institutions as their financial assets fall in value. The substantial decline in lending will lead to a substantial decline in investment and aggregate economic activity.

On the other hand, expansionary monetary policies have the opposite effect. Interest rates fall and the prices of securities increase. Therefore, more funds are available to credit markets and borrowing costs decrease; the values of investment portfolios increase; the cost of liabilities of financial institution falls; if liability cost adjust more quickly than asset yields, the earning speeds of financial institutions increases and vice versa; and the liquidity of financial institutions increases.

Table 2: Effects of monetary policy upon financial markets

Policy	Credit availability	Market rates	Security prices	Lending spread AR>LC	AR<LC	Liquidity of financial Institutions
Contractionary	Decrease	Increase	Decrease	Increase	Decrease	Decrease
Expansionary	Increase	Decrease	Increase	decrease	Increase	Increase
Note: AR= Interest Sensitivity of Asset Returns; LC=Interest Sensitivity of Liability costs.						

1. As Smaghi (2011) noted, the bulk of deposits for financial institutions, whether banks, broker-dealers, the so-called shadow banking system on hedge funds, is very much short-term. For example, broker-dealers fund themselves primarily in the repo market, mainly at overnight maturities while shadow banks fund themselves in the commercial paper market and the majority of the commercial banks rely on retail finance – chequeing and saving deposits – which usually consists of sight or short-maturity instruments. Wholesale funding for commercial banks is typically very short-term as well. So, when a central bank decides on the short-term interest rate, it directly affects the marginal price of leverage for virtually the entire financial sector. The problem arises when, due to low interest rates that make short-term funding cheap, the total debt raised by financial institutions goes beyond what may be considered socially optimal.

2. Low funding rates can inspire risky business strategies. For example, extreme forms of maturity transformation can be attractive, particularly if the risk adjustment calculus fails to make proper correction for the expected gains. In the search for higher nominal return on investment, financial institutions might be encouraged to buy assets typically with long-term maturity and possibility illiquid, financing them with short-term liabilities, thus, generating a large maturity and liquidity mismatch.

3. There is evidence that low short term interest rates induce banks to lend to borrowers with a poor credit history, or none at all. Low short-term interest rate policies generate an inflow of borrowers, which may reduce the probability of systemic financial distress. This is the negative aspects of the expansionary phases of the business cycle, periods during which more firms may be seeking credit. In this scenario, the proportion of unknown borrowers (or projects) in the market increases. The arguments is that banks may respond to the increased proportion of unknown borrowers by reducing their lending standards and expanding credit, which increases aggregate surplus but also increases the probability of a banking crises.

II.8 Financial System Stability and Monetary Policy

The goals of financial stability policies can be broadly defined as:

(I) Preserving the stability of the financial system by reducing the pro-cyclicality of the financial sector; and

(ii) Improving its resilience to adverse shocks.

In order to achieve these objectives, the main tools used are those that tame pro-cyclicality and those that improve resilience of the financial sector. The main tool used to tame pro-cyclicality is the counter-cyclical capital buffer. The main idea of counter-cyclical capital buffer is to encourage banks to build up more capital per unit of risk during the uprising well above the minimum requirements mandated by micro-prudential supervision. This way credit would become more expensive during the upswing and therefore might slowdown. Also, banks would not need to reduce the loan supply during the downswing since they could run down this buffer before reaching the binding constraint of capital regulation. This instrument aims to limit supply-driven credit expansions, which may retard economic recovery.

The other tool for taming pro-cyclicality is a ceiling on the loan-to-value ratio for collaterised loans, which is designed for demand-driven credit booms, By forcing the borrower to put up more to its own funds, it makes credit more expensive and reduces demand. When the demand for loan heats up, the loan-to-value ratio can be decreased, thus, increasing the cost and slowing down or stopping its growth.

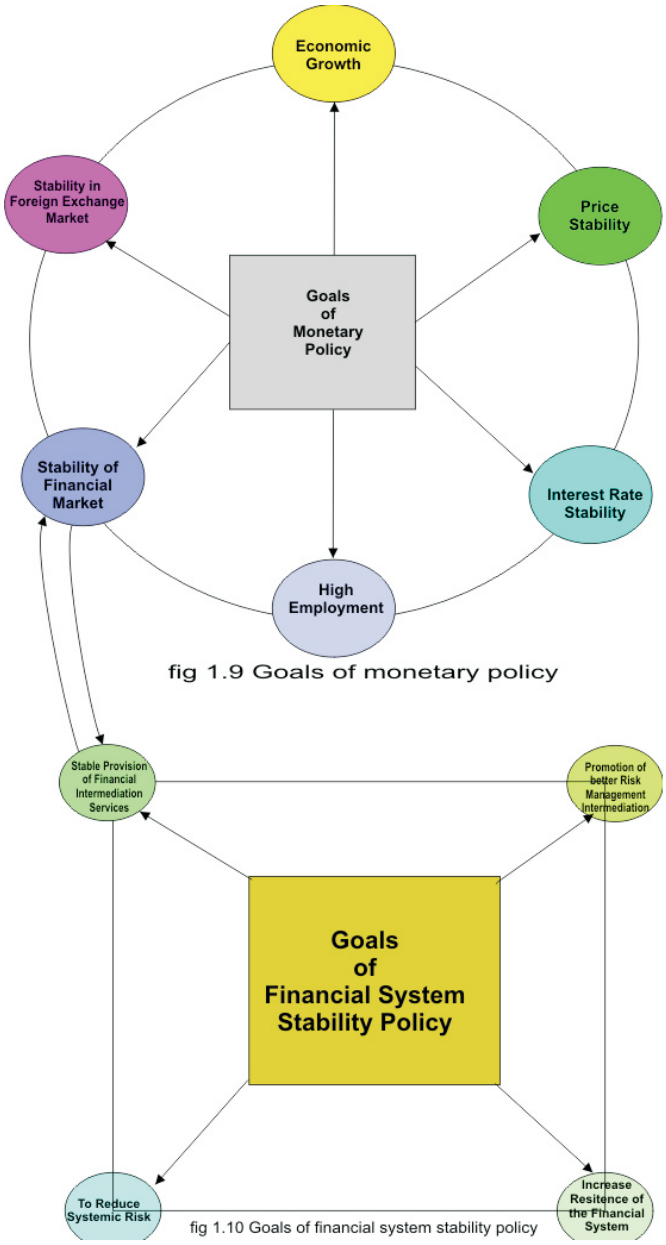
The tools that increase resilience of the financial system are also divided into two categories, namely: those that strengthen institutions; and those that seek to change the structure of the industry. The first category includes levies on Systemically Important Financial Institutions (SIFIs). The second category is market reforms such as a drive towards centralizing exchanges and structural reforms aimed at separating commercial banking from other activities.

Centralising transactions should reduce counter party risk and allow a better monitoring of financial flows, especially of derivatives, for which little data is available in general. The concentration of transactions also reduces uncertainty about who holds what – an uncertainty which, during a crisis, can end up freezing the entire markets and forcing central banks to intervene. Thus, the development of central clearing counter parties (CCPs) seem beneficial to the conduct of monetary policy.

The separation of commercial banking from other activities helps to protect deposit holders by insulating them from excessive risk-taking activities of banks. Such separation would reshape the financial industry and affect the transmission channels of monetary policy.

A lot of weight (pressure) is put on monetary policy tools during a crisis. In order to decrease such pressure, we use macro-prudential policies that reduce liquidity risk ex ante.

Figure 12: Goals of Financial System stability Policy



II.8.1 Macro-financial Linkages and Systemic Risks

Systemic risk is the risk of a crisis in the financial sector and its spillover to the economy at large. Specifically, systemic risk can be broadly thought of as the failure of a significant part of the financial sector leading to a reduction in credit availability that has the potential to adversely affect the real economy.

Systemic risks arise because of the inter-linkages between the financial sector and the macro-economy and between financial institutions and markets. Systemic risks arise because of externalities between institutions- the risks of a given firm increase because of decisions made by other players. As these risks cumulate, they can pose a threat to the whole system through spillover and contagion effects. For instance, liquidity crisis can lead to downward pressure on asset prices, thereby impacting the entire market. In addition, the fact that some institutions are two big to fail, creates a bias towards firms that are too large and too highly leveraged, and have too much counterparty risk.

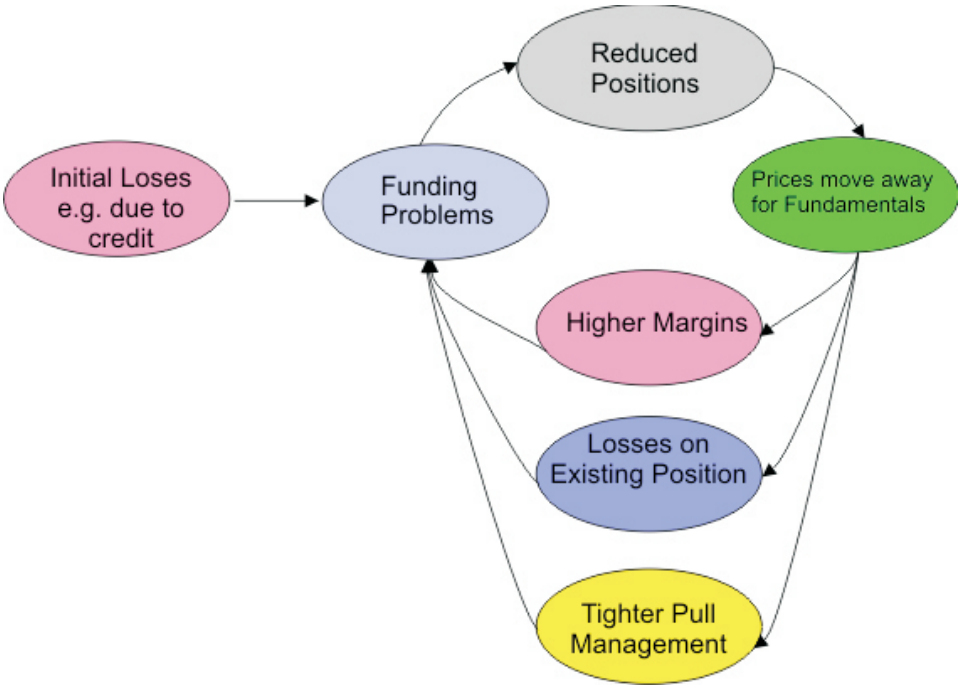
II.8.2 The Nature of the Externality of Systemic Risk

Systemic risk arises from externalities between institutions. By its very nature, systemic risk is a negative externality imposed by each financial firm on the system. Each individual firm is clearly motivated to prevent its own collapse but not the collapse of the system as a whole. So when a firm considers holding large amounts of illiquid securities, or concentrate its risk into particular ones (e.g. subprime – based assets), or puts high amounts of leverage on its books (as a way to drive up excess returns), its incentive is to manage its own risk/return trade-off and does not take into account the spillover risk it imposes on other financial institutions. The spillover risk arises as one institutions trouble triggers liquidity spirals (see fig 12), leading to depressed asset prices and a hostile funding environment that pull others down and then lead to further price drops, funding illiquidity, and so on.

Another externality comes from the rescue of failed institutions. When banks fail individually, other healthy banks can readily buy them or otherwise take up most of their lending and related activities. Thus, real losses primarily arise when banks fail together and this collective failure cannot be readily resolved.

The suggested approach to financial externality is to give financial institutions an incentive to internalise this negative externality through taxes and surcharges. By doing so, banks are given incentives to limit their contributions to systemic risk.

Figure 12: Liquidity Spirals – Financial linkage



Source: Brunner Meser Pedersen, Garleany (2007).

II.8.3 Systemic Risk Implications of Financial Linkages

i. Interconnectedness and Large Complex Financial Institutions

One of the most pervasive ways in which systemic risk manifests itself is through the too-interconnected-to-fail problem. The creation of large, complex financial institutions (LCFIs) engaged in some combination of commercial banking, investment banking, asset management, and insurance has led to stronger interconnections, innovation and growth. The operations of these LCFIs transcend national boundaries and engage in such activities as extensive interbank contracts, over-the-counter derivatives, equity, bond, and syndicated loan issuance, and trading activities globally.

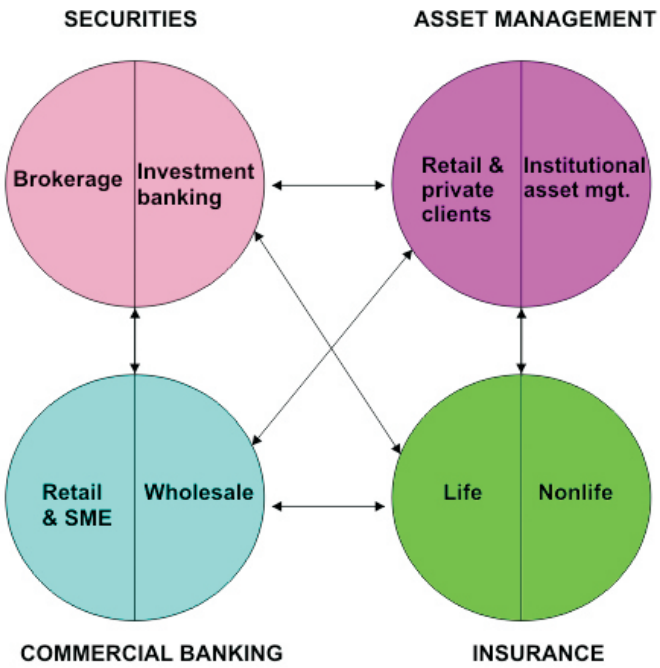
While these interdependence can increase the efficiency of the global financial system by smoothing credit allocation and risk diversification, they have also increased potential for cross-market and cross-border disruptions to spread swiftly. In addition, financial innovation, such as derivatives and securitisation, have enabled risk transfers that were not fully recognised by financial regulators and institutions themselves, and have complicated the assessment of counterparty risk, risk management, and policy response.

Interconnectedness means that difficulties in rolling over liabilities may spill over to financial system as a whole. Also, rollover risk associated with short-term liabilities is present not only in the banking sector, but equally importantly, in the non-banking financial sub-sector.

Factors that encouraged the development of LCFIs include the introduction of the universal banking regime, which expanded not only banks' powers to enter into securities services, but also their ability to enter into insurance and other financial services businesses, and vice versa. As a result, banks moved vigorously to build significant market share in investment banking, while certain large insurance companies acquired investment banking units to engage in capital market activities. Large scale mergers and acquisitions also contributed to the creation of LCFIs.

Furthermore, like their investment banking competitors, commercial banks increasingly relied on proprietary trading revenues as competitive pressure eroded intermediation margins. Some also expanded off-balance-sheet activities in swaps and other derivatives as well as special purpose, off-balance-sheet structured investment vehicles (SIVs) as a perceived profitable way of circumventing regulatory capital requirements and expanding their overall leverage.

Figure 13: The Complexity of Large Complex Financial Institution



II.8.4 Approaches to Assessing Implications of Financial Sector Systemic Linkages

There are four complimentary approaches used in assessing financial sector systemic linkages. These are:

The network approach: This approach relies primarily on institutional data to assess network externalities. Network analysis, which can track the reverberation of a credit event or liquidity squeeze throughout the system via direct link in the interbank market, can provide important measures of financial institutions' resilience to the domino effects triggered by financial distress.

The co-risk model: This methodology draws from market data, but focuses on assessing systemic linkages at an institutional level. Such linkages may arise from common risk factors such as business models or accounting valuation practices.

The distress dependence matrix: This matrix is based on market data, but instead of looking at bilateral relationships as above, the pair wise conditional probabilities of distress presented are estimated using a composite time-varying multivariate distribution that captures linear (correlation) and nonlinear interdependence among a set of financial institutions.

The default intensity model: Based on historical default data, this methodology focuses on the time-series properties of banking defaults data to assess systemic linkages. It measures the probability of failures of a large fraction of financial institutions (default clustering) due to both direct and indirect systemic linkages.

Each approach by itself has considerable limitations, but together the approaches provide an important set of surveillance tools and the basis for policies to address the too-connected-to-fail problem.

II.8.5 The Problem of Common Exposure

One major concern of interconnectedness is the problem of common exposure. When many institutions have an exposure to the same specific risk factor, it can make the system vulnerable to a shock to that factor. Also, intermediaries may be directly exposed to a frail institution through financial contracts. They may be exposed to indirectly and unknowingly, through their counterparts, who themselves are directly exposed to frail institutions. All institutions may also be vulnerable to the same underlying risk. The problem of common exposure may be related to the size of the institution. Large intermediaries usually are more interconnected, so they are typically a greater source of systemic risk.

II.8.6 The Fall of Bear Steans, Lehman and AIG

II.8.6.1 A Case of Systemic Interconnectedness and Size

Bear Stearns had substantive systemic risk. Though, Bear Stearns was the smallest of the major investment banks, it had a high degree of interconnectedness to other parts of the financial system. In other words, it was a major counterparty risk. For example, as a major player in the US$2.5 trillion repo market, which is the primary source of short-term funding of security purchases, bankruptcy would have meant that the typical lenders in these markets – money market mutual funds and municipalities – would have received collateral rather than cash for their investment. Since some of this collateral was illiquid, it is quite possible that these lenders would have to pull their funds from other institutions, sparking a run on the financial system. In fact, in the week leading up to the date of Bear's collapse, Lehman Brothers' five-year CDS spread rose from 285 basis points to 450 basis points in anticipation of a run.

Also, Bear Stearns was the leading prime broker on the Wall Street to hedge funds. Failure of Bear Stearns would have put at risk any hedge fund securities hypothecated at the firm. Depending on the outcome of the failure, hedge funds might pull assets from other financial institutions that faced even slight bankruptcy risk, again leading to a run on the financial system and failures of other financial institutions. Further, Bear Stearns was a major participant in the credit default swap (CDS) market. Bankruptcy of Bear Stearns would have meant the closing out of all outstanding CDS contracts. Again, depending on how these contracts were netted out within the system, a number of these CDS contracts would have to be liquidated given the nature of the illiquidity of CDS contracts, the fire sales of these CDS could have had a ripple effect across the financial system.

II.8.6.2 Lehman Brothers

Over the weekend following Friday, September 12, the government failed in its attempt to engineer a purchase of Lehman Brothers by other financial institutions without any direct government support. In hindsight, Lehman Brothers contained considerable systemic risk and led to the near collapse of the U.S. financial system (though that may have occurred regardless). Ex-post, it is not clear whether: the government thought Lehman was no longer systemic because of the Fed's opening of lending facilities to financial institutions, or as the government now argues, Lehman could not be rescued because Lehman did not have adequate collateral to post to access these facilities. In any event, similar to Bear Stearns, Lehman was a major player in various parts of the capital market. Its bankruptcy opened up the possibility that similar firms could also go bankrupt, causing a potential run on their assets. This led to Merill Lynch selling itself to Bank of America. The other two institutions, Morgan Stanley and Goldman Sachs, saw the cost of their five-year CDS

protection rose from 250 and 200 basis points (bps) to 500 and 350 bps, respectively, from Friday, September 12, to Monday, September 15. Both of these institutions filed for bank holding company status soon after.

II.8.6.3 American International Group (AIG)

As yet another example of possible systemic risk, consider the government's injection of funds into AIG on September 15. AIG received an US$85billion loan secured against all its assets, including its insurance subsidiaries, as a way to meet the collateral obligations of its US$400 billion portfolio of credit default swaps (CDSs) against a variety of higher tranches of collaterised debt obligations (CDOs) and collaterised loan obligation (CLOs) of mortgages, bonds, and loans. AIG posed two forms of systemic risk. The first was that its exposure to CDSs was all on one side – the firm was receiving small premium to insure against large, yet highly unlikely, losses. Of course, the unlikely event that losses would occur would be systemic in nature, causing the CDSs to be highly correlated in these states. AIG would then have to look over large amounts of capital it would not have access to at the parent level. As this systemic event became even slightly likely, AIG's counterparts demanded collateral to protect themselves against further declines, caused AIG to be strapped for funds. As it became clear AIG could no longer post collateral, AIG's forced bankruptcy would mean that US$400 billion worth of securities on other financial institutions' balance sheets would no longer be safely insured, leading to substantial write-offs, which in turn, would cause a fire sale of assets that could ripple across the financial system. At the very least, the insurance market for financial claims could freeze up.

III. Implications of Macro-financial Linkages for Monetary and Financial System Stability

III.1 The Emerging Framework for Financial Stability

The goals of monetary policy include:

- Economic growth, price stability, interest rate stability, stability in the financial markets, and stability in the foreign exchange markets.

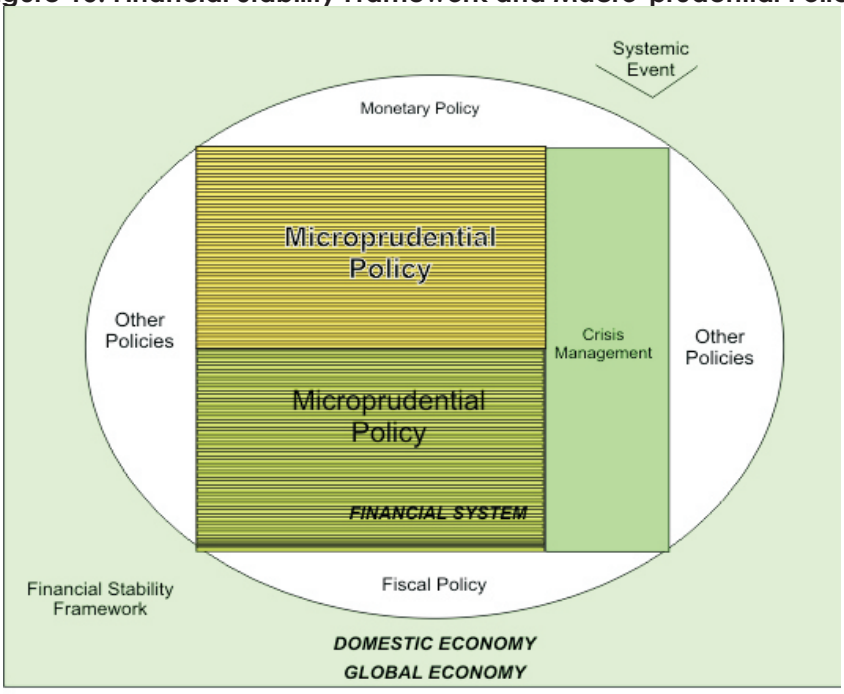
On the other, the goal of financial stability policy is the stable provision of financial intermediation services to the wider economy which include: payment services, credit intermediation and assurance against risk. Financial stability polices seek to avoid the type of boom and bust cycle in the supply of credit and liquidity, which usually lead to severe financial crisis. In other words, financial stability policies seek to increase the resilience of the financial system.

With respect to these goals, macro-financial linkages pose a basic challenge to policy makers: should the policy makers be concerned more with protecting the

banks (financial institutions) from the credit cycle or protecting the real economy from the banks. The resilience of the banking system affects the supply of credit, which in turn, affects the economic conditions influencing loan delinquencies and defaults.

Based on the emerging framework for financial stability (figure 15), while the primary responsibility of the financial system needs to rest with macro-prudential policy, other policies are required to complement it. No matter how different policy mandates are structured, addressing financial stability and systemic risk is a common responsibility. Prominent role can be played by micro-prudential and monetary policies, both of which impact on the cost of risk in the financial system and the economy. The larger the buffers created by the former, the smaller the need for macro-prudential policy to step in. Other policy areas such as accounting standards, corporate governance, disclosure, and crises management and resolution frameworks are required to work together with macro-prudential policies to achieve the desired stability in the financial system. Indeed, it is important to underline that macro-prudential policy cannot substitute for sound policies, involving, in particular strong micro-prudential regulation and supervision, and sound macroeconomic policies.

Figure 15: Financial Stability Framework and Macro-prudential Policy



Oval figure: financial stability framework. other policies involve, e.g., policies related to business con consumer protection, accounting rules, and competition

Source: Brockmeijer et al., 2011.

III.2 Policy Responses to Address Macro-financial Risks

As we have seen from the analysis in the foregoing sections, macro-financial linkages are major sources of financial instability through contagion and spillover effects. Due to macro-financial linkages, vulnerability and excess built-up in financial markets and institution can affect the wider economy, with sometimes devastating results. By the same token, the health of the financial sector can be severely tested by developments elsewhere in the economy. In fact, these two-way macro-financial linkages all too often create potentially dangerous feedback mechanism that without rapid effective policy intervention can trigger deep and long-lasting economic downturns.

Addressing systemic risk generated by macro-financial linkages requires a broad framework of prudential tools that includes rules and mechanisms that promote better risk management on the part of intermediaries and also reforms that reduce the vulnerability of the financial system to the liquidation of any single financial firm. These rules are known as macro-prudential instruments. The aims of the policies would be to make intermediaries bear, or internalise, the costs that their behaviour imposes on others. Some of the macro-prudential policies that have been developed recently include:

1. *Systemic Capital Surcharge:* To be effective in limiting systemic threats, a systemic capital surcharge probably would be disproportionately larger for firms that contribute the most to systemic risk. This way, intermediaries would have an incentive to limit the systemic risks they create.

2. Macro-prudential regulators could also make capital requirements vary with the business cycle. For example, in good times, capital requirements would rise above the long-run average to create a capital buffer against adverse shocks and to discourage euphoria.

3. Regulators could require banks to buy catastrophe insurance or could ask banks issue so-called contingent convertible bonds that convert to equity in the event of a capital shortfall.

4. *Variable risk weight:* This would involve raising capital requirements against specific types of lending. If the authorities felt financial institutions' exposure to a certain asset class was too great, they could try to discourage it in this way.

5. *Leverage limits:* This would impose an overall limit on the amount of leverage financial institutions could hold. It would act as a "back-stop" to capital requirements which are typically risk-weighted.

6. *Forward-looking loss provisioning:* Banks would be forced to set aside provisions against prospective future losses on their lending. These are various ways this could be used as a macro-prudential tool, with Spain's 'dynamic provisioning' systemic offering a useful practical example. This system links loss provision to the credit cycle, so banks are forced to hold higher provisions when credit is growing strongly. Any such approach should, however, respect the integrity of international accounting standards.

7. *Collateral Requirements:* This would limit specific types of lending by imposing higher collateral restrictions during times of unsustainable growth in their lending., margin requirements on stocks/purchases or the imposition of haircuts on repurchase transactions for investment banks.

8. *Quantitative Credit Control and Reserve Requirements:* These would limit lending by imposing limits on lenders and/or increasing financial institutions' short-term liquidity requirements. Such a system was used in the UK until the early 1980s, although it is likely to lead to distortion if applied over an extended period.

9. *Capital Surcharge on Systemic Important Financial Institutions (SIFIs):* These include liquidity buffers, contingent capital, convertible bonds, insurance, etc.

III.3 Policy Response to Macro-financial Crises

Many divergent approaches have been proposed and tried to resolve systemic crises more efficiently. The differences in approach reflect in part different policy objectives which include:

i. Reducing the fiscal cost of financial crises;
ii. Limiting the economic costs in terms of lost output;
iii. Accelerating Restructuring; and
iv. Achieving long-term structural reforms.

Central to understanding a sound policy approach to financial crisis is the recognition that policy responses that reallocate wealth toward banks and debtors and away from taxpayers face a key trade-off. Such reallocation of wealth could help to restraint productive investment, but they have large costs. These costs include taxpayer's wealth that is spent on financial assurance and indirect costs from misallocation of capital and distortion to incentives that may result from encouraging banks and firms to abuse government protection.

In reviewing crises policy responses, it is useful to differentiate between the containment and resolution phases of systemic restructuring. During the

containment phase, the financial crisis is still unfolding, government tend to implement policies aimed at restoring public confidence to minimise the repercussion on the real sector of the loss of confidence by depositors and other investors in the financial system. The resolution phase involves the actual financial, and to a lesser extent operational, restructuring of financial institutions and corporation.

Table 3: Crisis Containment and Resolution Policies

S/N	Crisis Containment Policies	S/N	Crisis Resolution Policies
1	Supervision of convertibility of deposits, which prevent bank depositors from seeking repayment from banks	1	This entails the resumption of a normally functioning credit and legal systems, and the rebuilding of banks' and borrowers' balance sheets.
2	Regulatory capital forbearance, which allows banks to avoid the cost of regulatory compliance, e.g. by allowing banks to overstate their equity capital to avoid the costs of contraction in loan supply.	2	Government - subsidised work - outs of distressed balance sheets.
3	Emergency liquidity support to banks	3	Debt forgiveness.
4	A government guarantee to depositors	4	The establishment of government owned asset management company (AMC) to buy the resolved distressed loans.
5	Administrative interventions, including temporary assumptions of management powers by a regulatory official or closure, which may include the subsidised compulsory sale of a bank's good assets to a sound bank together with the assumption by that bank of all or most of the failed entity's banking liability.	5	Government - assisted sales of financial institutions to new owners, typically foreign.
		6	Government assisted recapitalization of financial institutions through injection of funds.

The appropriate containment policy response would depend on whether the trigger for crisis is a loss of depositors' confidence (triggering a deposit run), regulatory recognition of a bank's insolvency, or the knock-on effects of financial asset market disturbances outside the banking system, including exchange rate.

IV. Summary

1. Financial crisis occur as a result of financial excesses in the course of the interplay between economic and financial activities, inordinate financial market behaviour and improper structural changes in financial markets and their implications for official policies. Financial institutions play key intermediary roles in the economy. They finance a variety of demanders of credit. When they perform this roles as intermediaries well, our economy and society benefit. When they perform below expectations, our economy and financial markets suffer, and in extreme cases, crises may follow. Financial institutions therefore, need to balance their entrepreneurial drive with their fiduciary responsibility. In most cases, however, this balance is not maintained. When entrepreneurial risk becomes pervasive throughout financial markets, a financial crisis can take hold. Structural changes in the financial markets encourage excessive risk taking. Therefore, regulators should continually change how they supervise financial markets accordingly.

2. The credit intermediation service of banks is the main linkage of the financial sector to the real economy, while the money supply tool is the major linkage of the monetary sector to the financial sector. Also, the off-balance sheets transactions, the structured investment vehicles (SIVs) and conduits are the linkage between the traditional banking and shadow banking sectors. The separation of commercial banks from investment banking activities reduces the linkage between the regulated and unregulated (or less regulated) sector and in turn reduces the counterparty risk externality that can affect economy-wide intermediaries. It reduces ex post pressure o regulator to bail out even unregulated institution by rendering them systemically less imported (that is, not too intermediated to fail). The separation is a possible why of insulating the payments and settlement system from securities activities.

3. Monetary policies can affect systemic risk through a number of channels. First monetary policy has a direct effect on asset prices for obvious reason that interest rates represent the opportunity costs of holding assets. Indeed, an important element of the monetary mechanism works through the asset price channel. In theory, an increase in asset price induced by a decline in interest rates should not cause asset to keep escalating in bubble – like fashion. But if bubbles develop, perhaps because of an onset of excessive optimism, and, especially if the bubbles are financed by debt, the result may be a build-up of systemic risk. Second, accommodative monetary

policy could provide mechanism for a build-up of leverage and excessive risk taking in the financial system.

4. Macro-prudential intervention might also have macroeconomic spill-overs. For example, rigorous enforcement of supervisory standards for capital following real-estate related loan losses may slow the economy's recovery from a recession. The need for more stringent bank capital and liquidity requirements imposed by macro-prudential tools to stem systemic risk could lead to high unemployment. This type of spill-over cannot be offset by monetary policy.

In the light of the above, macro-prudential and monetary policy should be closely coordinated. The central bank has an important role to play in this coordination task for good reasons. The central bank has long experience in supervision, broad knowledge of financial markets, and an understanding of the linkages between financial markets and the economy. In addition, the insights derived from central bank's supervisory role benefit the conduct of monetary policy.

For effectiveness, the pursuit of macro-prudential supervision should involve other regulated agencies, other than the central bank. There are important reasons for this approach. First, systemic risk surveillance will benefit from the perspective of regulators with different windows on the financial system. Second, central bank independence in the conduct of monetary policy is widely accepted as vital to achieving optimal employment and price stability. So it is possible to attain good outcomes by carrying out monetary policy and macro-prudential policy separately and independently with the goals of each pursued using separate tool kits. It must be understood that fully optional policy generally calls for coordination between the two policies, especially when spill-over occurs.

5. Financial linkages and the problem of moral Hazard: Due to the linkages and interconnectedness of large complex financial institutions, they secure government support in case of crisis because of the too-connected-to-fail problem. This leads to moral hazard behaviour (undue risk-taking) by financial market participants.

V. Recommendations

1. There is need to prevent institutions from becoming too connected to fail: The recent financial crisis underscored the problem of an institution that is too connected to be allowed to fail because it is linked to many other financial institutions. The demise of such an institution could thus trigger catastrophic failures within the financial sector and probably in other sectors of the economy. The growing complexity and globalisation of financial services can contribute to economic growth by smoothing

credit allocation and risk diversification, but they can also exacerbate the too-connected-to fail problem.

2. Pre-emptive not reactionary policy action: At the wake of every financial crisis, policy makers across the globe try to outpace each other in the roll out of a new set of regulations to deal with the smoking gun. Even in the face of new hopes and then eventual recovery, this post-mortem approach means that we are often left with irredeemable casualties. There is need for early identification and assessment of systemic risks. This requires identifying and measuring systemic risk in a forward – looking way in order to support improved policy judgments. New regulations must be forward-looking and must provide adequate cover for all foreseeable risks. In the absence of that, whistle blowers must blow it loud and clear for all to hear when it should be heard-before the fall. Let me state that this is not in any way, an easy task. The understanding of systemic risk and the fault like in the structure of the financial system that makes it prone to instability or failure is still incomplete. Moreso, there is still limitation in the analytical tools. So the challenges are formidable and require an all hands approach. Regulators must develop a comprehensive proposal for regulatory reforms that will restore confidence in the integrity of the financial system. A passion for unhealthy returns will drive us to the point of detrimental risks. There should be less emphasis on aggressive revenue growth and a focus on risk-adjusted profitability.

3. Fuller and more transparent disclosure levels: Regulatory oversight in Nigeria capable of preventing any systemic failure currently exists only in the Banking and Pension sectors, while Investment Banks and Insurance companies are relatively exposed. However, had the CBN adopted more robust disclosure standards on prior to the crisis, we might have averted our own version of the crisis. The disclosure levels in the Nigerian financial space lags behind acceptable international standards. We strongly support increased transparency, including all efforts to make financial products easily understood by both consumers and investors. Transparency also can be increased by the use of public enforcement tools such as cease and desist orders and the use of public rulemaking powers to prohibit specific practices or product features deemed unfair or deceptive. The poor disclosure levels and abuse of insider information in the Nigerian capital market encourages price manipulation, round tripping and often triggers panicky sell-offs. The abuse of insider information currently operates as the norm rather than the exception. The control of insider abuse should be placed at the fore-front and not be relegated as a non-issue. An efficient market should operate at some optimum levels at the transparency and disclosure levels of information and this should be available to all market participants.

4. Separation of Traditional Banking and Shadow Banking: We are aware of the adverse role of linkages from the unregulated sector to the regulated sector, that is, from the shadow banking sector to the traditional banking sector. The separation of the commercial banks from investment banking activities reduces the linkage between the regulated and unregulated sector (investment banks), and in turn reduces the counterparty risk externality that can affect economy-wide credit intermediation. It also reduces ex post pressure on regulators to bail out even unregulated institutions by rendering them systemically less important (that is, not too interconnected to fail). The separation is a possible way of insulating the payments and settlement system from securities activities.

5. Capital surcharges based on systemic linkages, limit on institutions' exposure and introduction of a liquidity risk insurance fund.

6. Establish centralised clearing systems which provide a means to reduce counter-party risk and the potential systemic implication of financial linkages. Central clearing house internalizes the risk externality and would thus impose efficient collateral and margin requirements on market participants. This ensures minimal, near-zero counterparty risk on all traders. Equally important, clearing members monitor each other, given their co-insurance arrangement.

7. Leverage Requirement: There is need to implement an overall leverage requirement that consolidates off-balance sheet exposures.

8. Compensation in the financial system: Compensation systems in the financial services industry should be aligned to the avoidance of system risk. A practice whereby executives of financial institutions are appraised based on the volume of credits generated (with no recognition of the quality of the credits and its associated systemic risk implications) which encourages the executives to take uncalculated risks, is to say the least, unacceptable. Such measures as compensation through stock (held for longer periods) and stricter protective rules for top management would probably make sense.

9. Adoption of global regulatory framework - there is a need to harmonise regulatory arbitrage between jurisdictions. Nigerian institutions have to adopt global best practices in all aspects of their operations. The CBN's introduction of IFRS accounting standards to bank's financial reporting is just the beginning of a long journey. New IASB and Basel II standards in the wake of global financial crunch need to be quickly adopted and implemented, and enforced to end the credibility crisis created by the abuse of insider related credits. The process of conflict resolution and

arbitration needs to be independent and enforceable to calm the nerves of foreign and local investors.

10. Filling information gaps on cross-market, cross-currency and cross country linkages, to refine analysis of systemic linkages. This would require imposing additional disclosure requirements on financial institution, access to micro-prudential data from supervisors, more intensive contracts with private market participants, improved comparability of cross-country data, and better sharing of information on a regular and ad-hoc basis among regulators.

11. Macro-financial Research/Timing: In view of the centrality of macro-financial linkages in financial crisis events, there is need for a well-defined program of research in macro-finance by the CBN supported by a clear and enduring commitment by the executive management of the apex Bank. Some of the areas such research effort should focus include: what tools to be used in response to imbalances in real estate markets, impact of regulation of financial intermediation on the real economy, the potential conflicts of interest between monetary policy and financial stability or between micro-prudential supervision and financial stability, etc. Also, a detailed look at the training and recruitment program in the microfinance area is clearly of potential relevance.

12. Minimising Regulatory Arbitrage: Regulation should not be narrowly focused on a single ratio from the bank balance sheet such as capital requirement. It would be more prudent for regulators to regularly assess individual and collective bank health based on a variety of different aspects of their balance sheets, and indeed based on market indicators. Additional ratios to examine should include loans-to-deposit ratios, deposit-to-assets ratios, liquidity-to-assets-ratios, and so on.

13. Additional Responsibilities for FSRCC: The FSRCC is presently charged with the responsibility for coordinating regulatory issues among the agencies that regulate Financial Institutions in the country. The memorandum of understanding currently existing among the Financial Sector Regulation Coordinating Committee (FSRCC) should be reviewed or enhanced to facilitate Consolidated Supervision.

The recommended additional responsibilities for the enlarged body are as follows:

Maintaining a central database in respect of all the financial institutions supervised by the different regulatory bodies with restricted access as may be agreed in the memorandum of understanding (MOU);

Each Regulator should establish a nodal cell at its end to facilitate information sharing among all members of the financial services regulation coordinating

committee (FSRCC); and

The salient features of the outcome of the analysis done by each regulator and any development that may require the attention of any other regulator should be shared among regulators.

Although these measures could inspire additional demands and costs on financial institution, however, they are far better alternatives to waiting until a crisis begins and information become apparent as event un-fold.

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