

## *Financial Stability: 2007 to 2012 – Five years on\**

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Mr. D. Sarkar, CMD, Union Bank of India, Mr. Pratip Chaudhuri, Chairman, State Bank of India, senior members of the banking fraternity, delegates to the Conference, members of the print and electronic media and other distinguished guests. It is my privilege to be here in FIBAC 2012 whose theme is '*Sustainable excellence through customer engagement, employee engagement and right use of technology*'. FIBAC is an important forum for serious deliberations on banking sector issues. This year an impressive range of topics is being covered in this Conference with an objective of achieving and sustaining excellence by the banking system. You will appreciate that for achieving these objectives, financial stability is an absolutely necessary backdrop. Therefore, I have chosen to speak on the evolution of the concept of financial stability in the post-crisis period and the regulatory framework around it. Financial stability is a shared responsibility and therefore, apart from the Reserve Bank of India and the Government, banks also carry a significant responsibility in this regard. Banks have to ensure that their business models and conduct, promote financial stability.

2. Let me step back a little and briefly touch upon the background which prompted financial stability to assume centre stage. Global financial markets froze abruptly following collapse of Lehman Brothers on September 15, 2008, and have never fully recovered since then. While there have emerged signs of hope, of 'green shoots', from time to time, they too have been quickly dashed. While it was the financial sector which triggered the instability at the outset, it is now the high debt burden in advanced economies which threatens the safety of the financial system and continues to be a drag on economies. The financial system is far from

being sound as banks in several advanced economies, particularly in the Eurozone remain vulnerable. Structural imbalances, predating the crisis, persist. The room for fiscal and monetary manoeuvre has shrunk drastically due to the burden of rescue shared by these policies in the aftermath of the sub prime crisis of 2007. Central bank balance sheets across the world have grown in size and have almost doubled in the last decade and now amount to about 30 per cent of world GDP. Central banks have quickly emerged as the single largest creditors of governments, especially, in the beleaguered Eurozone. Interest rates too have been slashed in a bid to stimulate the sagging economies and the rates are either zero or nearly zero in advanced economies. The expanded balance sheets of the central banks and the near zero policy rates have raised concerns that financial imbalances may buildup all over again.

3. It is now five years since the outbreak of the global financial crisis. The developments during these years have thrown the global economy off balance and seriously challenged the intellectual framework and traditionally held beliefs about the functioning of the financial system, theory and practice of monetary policy and macro-economic modelling. In the new order of things, financial stability has come to the centre stage of policy making across the globe.

4. Against this backdrop, I will speak today about three sets of developments. First, I will present a brief synopsis of the regulatory changes which have been effected in the years since the financial crisis first broke out. Second, I will present a snapshot of the attempts being made to assess and measure systemic risk, in its many facets. Third, I will discuss the institutional arrangements made to manage financial stability in different countries. I will then present the Indian approach to financial stability and conclude with some of the challenges that confront us in the days to come

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as we strive together to put in place a healthier and more resilient financial system.

## II. Financial Stability – Pre and Post Crisis

5. The global financial crisis of 2007 was caused by a combination of macroeconomic and, regulatory and supervisory factors and their interaction. At the core of the crisis lay an interplay between macro imbalances which had grown rapidly in the last ten years, and the financial market developments and innovations which accelerated over the last 10 to 15 years, partly under the stimulus of the macro imbalances<sup>1</sup>. In the years leading up to the financial crisis, policy framework for the financial sector globally was guided by a few doctrines. *One*, monetary policy should focus only on price stability (the inflation targetting framework). *Second*, price stability ensures financial stability, the latter being pursued through micro prudential regulatory and supervisory framework. *Third*, the approach towards asset price bubbles, when they are building up, should be one of 'benign' indifference and central banks should 'mop the dust' when bubbles burst, with aggressive easing of monetary policy – the now infamous *Greenspan orthodoxy*. *Fourth*, light touch regulation is the way forward in a 'free market' environment where markets self correct in the larger interest and welfare of the economy. *Fifth*, a set of individual financial institutions constitutes a healthy and robust financial system.

6. The overall policy framework, prior to the crisis, reflected these doctrines. The policy approach comprised inflation targetting to ensure price and macroeconomic stability and prudential regulatory and supervisory policies focussed on the health and stability of individual institutions. Systemic concerns, especially contagion risks, were sought to be contained through a robust financial infrastructure.

7. In this scheme of things, liquidity risk did not receive the serious consideration that it was entitled to and there was a glaring conceptual flaw inasmuch as there was no framework to address systemic risks. The experiences during the crisis drove home the fact

<sup>1</sup> The Turner Review (2009) – A Regulatory Response to the Global Banking Crisis.

that the risk of financial system disruptions that can destabilise the macroeconomy were not correctly understood and that the impact of interlinkages and common exposures across the financial system were not fully appreciated. The critical lesson which has emerged from the crisis is that financial stability needs to be pursued as an explicit policy objective, and the pre-crisis notion of mopping up the debris from financial bust is not a viable policy as it can have huge macroeconomic costs which we are witnessing today.

8. The crisis also brought to the fore the role of the sovereign in financial stability – first as a lender of last resort in case of bankruptcy and then as the harbinger of financial instability. The burden of past fiscal indiscretions in several advanced economies, coupled with the stimulus measures taken as part of the crisis management has returned to haunt policy makers. Global instability acquired a new 'avatar' – that of a sovereign debt crisis.

9. To address the deficiencies which led to the global crisis, the international standard setters – Basel Committee on Banking Supervision (BCBS) and Financial Stability Board (FSB) – have undertaken a massive overhaul of the regulatory framework. The comprehensive reform package known as Basel III framework is designed to address both firm specific risk and broader systemic risk. Basel III essentially enhances the regulatory framework introduced by Basel II at the level of individual banks. It also sets up a macro-prudential overlay to limit systemic risk. The measures relate to enhancing the quality and quantity of capital, liquidity risk management, valuation practices, dealing with procyclicality issues and with systemically important banks. It also encompasses resolution mechanism, compensation practices, stress testing, disclosures to enhance transparency and moving OTC derivatives to central clearing and settlement mechanisms for reducing the systemic risk in derivative markets.

## III. Systemic Risk- The elephant in the room

10. Measuring and analysing systemic risk is at the core of ensuring financial stability. It is, therefore,

important to understand what systemic risk is. While there is no single universally accepted definition of systemic risk, it is now commonly accepted that these are risks which affect large chunks of the financial system and which have the potential to adversely impact the real economy. A comprehensive definition of risk as defined by the IMF, FSB and BIS is '*a risk of disruption to financial services that is caused by an impairment of all or parts of the financial system and has the potential to have serious negative consequences for the real economy.*' There is also a broad agreement that there are two facets to systemic risk. In its first dimension, systemic risk evolves over time. This time dimension of systemic risk is also called *procyclicality* and it deals with the buildup of risks through financing imbalances. The imbalances *i.e.* high leverage, rapid credit growth and compressed risk premia build up during the expansionary phase of a business cycle due to the inherent procyclicality of the financial system and through the risk taking channel. These imbalances interact with macro economy amplifying the booms and busts. Larger booms lead to larger busts and larger damage to macro economy. The second dimension, *interconnectedness*, relates to systemic risks being distributed across the financial system at any given point in time. These risks relate to common exposures, entangled balance sheets, common business models or profiles and interconnectedness amongst financial institutions.

11. The set of policies which deal with managing the systemic risk is known as macro prudential policy. Macro prudential policy tools are essentially micro prudential tools *i.e.* capital provisioning, Loan-to-Value ratios, debt to income ratios, *etc.* which are applied both at the institution level as well as at the system level as an overlay to micro prudential requirements in a countercyclical way. These tools are used to limit systemic risk and thereby minimise disruptions in the provision of key financial services that can have serious consequences for the economy by (i) dampening the buildup of financial imbalances; (ii) building defenses that contain the speed and sharpness of subsequent downswings and their effects on the economies; and (iii) identifying and addressing common exposures,

risk concentrations, linkages and inter-dependencies that are sources of contagion and spillover risks that may jeopardise the functioning of the system as a whole. While the third objective of macro prudential policy [(iii) above] is concerned with the cross-sectional dimension, the first two objectives [(i) and (ii) above] are concerned with the procyclicality issues. Reserve Bank of India has been using macro prudential policies, more notably the countercyclical policies, since 2004 as a toolkit for ensuring financial stability though it had used them sporadically even earlier.

12. While there is credible evidence regarding the ability of countercyclical policies to enhance the resilience of the financial system, the evidence regarding their ability to dampen the buildup of financial imbalances is not unequivocal and credible. RBI had countercyclically raised risk weights and provisioning for certain sectors during the expansionary phase of 2004-08. While these policies could dampen the rapid credit growth of the Commercial Real Estate sector, they were not as effective for other sectors. Spain's case is another example, which had pioneered dynamic provisioning, a countercyclical tool. Dynamic provisioning had significantly enhanced the resilience of the Spanish banking system but it could not dampen the credit boom in the housing sector. The inability of macro prudential policies to dampen the buildup of financial imbalances would leave the system still vulnerable despite building up the resilience. It is thus evident that macro prudential policies would need support from other policies, more notably monetary policy. The question of monetary policy having a role in containing the buildup of financial imbalances by *leaning against the wind* has thus got reopened. There is still a lack of consensus on this issue but increasingly an opinion is gaining ground that monetary policy should complement the macro prudential policies for dampening the upswing by leaning against the wind. In effect, it means that when the financial imbalances are building up in the system threatening financial stability, the policy rates could be raised above what would, otherwise, be warranted for achieving the inflation target within the defined time horizon. In this framework, the monetary policy response to financial

cycles would be more symmetric during the expansionary and recessionary phases unlike under the Greenspan doctrine which prevailed earlier. The coordination between the two policies and with other policies is important. Generally the two *i.e.* monetary policy and macro prudential policy would operate in the same direction. However, there could be situations where the two may be pulling in opposite directions and that is where the hierarchy of policy objectives will have to be determined and acted upon.

#### IV. Measuring Systemic Risk

13. Over the last five years, as our understanding of systemic risks has increased, so has our realisation that assessment of such risks is far from straightforward. Systemic risks *per se* are typically complex, encompass multiple facets of the financial system, and are very often opaque. It became clear during the crisis that no single measure or tool would be sufficient to cover all the different aspects of systemic risks. Assessment of systemic risks necessitated development of diagnostic tools that simultaneously trace the changes in macro-financial conditions which pose risks to financial stability, identify 'point in time' risk conditions, while also assessing the potential future impact of all these risk factors, jointly, on systemic stability. The tools, thus, needed to take simultaneous cognisance of various facets of the financial system with their myriad correlations and intersections and also peep through the proverbial 'crystal ball'<sup>2</sup> into the future as to how these facets may evolve.

14. These challenges have spurred a great deal of research within central banks, in academia, and elsewhere leading to the development of a host of new quantitative measures of systemic risk. The models variously attempt to measure the systemic risk in the financial system, quantify the contagion, capture distress dependencies amongst financial institutions, measure the systemic importance and the resilience of the financial system. Other class of models relates to stress tests while yet another class aims to develop

coincident indicators of systemic stress and attempt to develop early warning indicators. Let me discuss some of these emergent techniques.

##### **(i) Measuring systemity and assessing resilience**

15. The first set of quantitative techniques, which I am going to touch upon, deals with the systemic importance of institutions. The experience during the global financial crisis brought to the forefront, the concept of 'too big to fail' and 'too connected to fail' institutions and raised a whole range of questions. Why are these entities important? How do they affect the risks of the overall financial system? How does distress in any financial firm and especially in a 'too big to fail' financial institution, affect the rest of the financial system? There are, in fact, several ways in which this can happen and understanding each of these, is the key to designing prudential policies to address such risks<sup>3</sup>.

16. *First* is the *domino effect* – a distressed financial institution may be unable to meet its liabilities to other financial institutions, resulting, in turn, in these counterpart financial institutions failing to meet their liabilities to others. If the distressed firm is significantly large, the overall contagion impact of its failure can severely strain the financial system.

17. *Second* is the potential market impact of the fire sale of assets, by the distressed financial institutions which may affect asset prices, margin calls and mark to market losses for other financial sector entities holding similar assets. These entities may, in turn, be forced to sell their own assets to meet their liquidity requirements. As the financial crisis showed, the adverse impact of such collective sales by financial institutions could result in a significant dislocation of asset markets.

18. *Third*, the impact of a 'too big to fail' financial institution is further aggravated if the entity is also a provider of a critical service in financial markets, such as payment and settlement systems, as would typically be the case with most large financial institutions.

<sup>2</sup> 'Systemic Risk Diagnostics, Coincident Indicators and Early Warning Signals', Bernd Schwaab, Siem Jan Koopman and André Lucas, ECB WORKING PAPER SERIES, NO 1327/APRIL 2011

<sup>3</sup> 'Regulating Systemic Risk', Remarks by Daniel K. Tarullo, at the 2011 Credit Markets Symposium, Charlotte, North Carolina on March 31, 2011

19. *Fourth*, there is also the reputational impact that the failure of a financial institution has on other financial institutions, especially those with similar business profiles. Failure of an institution may reinforce and magnify the adverse feedback loop leading to a chain of failures. This contagion impact is, however, not necessarily a function of the size of the financial institution. Indeed, the failure of even a relatively small financial entity could cause widespread systemic concerns if it highlighted a hitherto unrealised source of risk.

20. Given the potential of large or systemically important financial institutions to cause system-wide distress in the event of their failure, there have been concerted efforts to develop models/techniques for the measurement of, first, the systemic risk of the financial system and, second, methodologies through which such systemic risks could be attributed to individual financial institutions. These models attempt to quantify or assess the role that the bank's/financial institution's size, its risk profile, the degree of exposure to a risk factor, *etc.*, play in determining the institution's contribution to systemic risks.

21. Traditional attempts to measure systemic risk have focused on banks' balance sheet information, such as non-performing assets, earnings, liquidity and capital adequacy ratios. Post crisis, the focus has increasingly moved to market based measures both because of the availability of higher frequency data and the fact that such data is usually forward looking and reflects the market expectation of the future performance of the underlying institutions.

22. Different sets of models have been developed using equity prices, CDS prices, CDO indices, LIBOR spreads, *etc.*, as proxies for systemic risks, employing techniques such as econometric analysis including Principal Component Analysis to derive the systemic risk measure. Another set of techniques use the Merton model to estimate the asset portfolio of banks and to derive a systemic risk measure which is based on the probability of default of a given proportion of banks in a given financial system. Another set of measures assesses systemic risk by computing the multivariate density of a portfolio of banks. For example, these

models propose a set of banking stability measures based on distress dependence, which is estimated by the Banking System Multivariate Density (BSMD). Another set of systemic risk measures are based on the traditional risk management tools such as value-at-risk (VaR) and expected shortfall (ES).

### ***(ii) Stress testing measures***

23. Stress testing has assumed great importance as a risk management tool, particularly because it helps in overcoming limitations of models and historical data. Stress tests evaluate the potential impact of an extreme event on a financial firm or financial sector. Stress testing exercises, especially macro stress testing, are increasingly becoming an important component of a macro prudential policy framework. These tests provide a thorough assessment of what could happen if the identified risks materialise.

24. A wide variety of stress tests are employed to assess the resilience of financial institutions and of the financial sector. The methodology employed varies from '*top down*' approaches (which are typically implemented by regulators/supervisors by applying uniform stress scenarios to the balance sheets of all financial institutions) to '*bottom up*' approaches (where the stress tests are conducted by individual institutions themselves, relying on a common set of assumptions and/or scenarios determined by regulators/supervisors) and also a combination of both.

25. The adverse scenarios that underpin the stress tests typically encompass both sensitivity tests and scenario analysis. In the first case, only a single key variable, *e.g.* interest rates or exchange rates, is shocked. Such single factor sensitivity tests are typically the starting point of stress testing exercises as they are relatively simpler to implement. These tests, however, lack plausibility as, in the event of the shock materialising, it is unlikely that only a single variable will be affected.

26. In contrast, scenario analysis based stress tests examine the impact of simultaneous changes in a number of key economic variables. These tests, based on historical or hypothetical stress scenarios, lend greater plausibility to the stress testing exercise and

also yield a more accurate assessment of total losses under adverse developments. Not surprisingly, they are relatively more difficult to implement as it is difficult to anticipate the manner in which different macro variables would move together, especially under conditions of stress.

27. Of late, there is an evidence of the increased use of macroeconomic models to design stress tests. Economic models are being used to examine the linkages between the health of financial institutions and underlying driving factors (macro-financial variables or latent factors). Often, these models also incorporate the feedback effect from the banking system to the rest of the economy. Some models also use the joint vector auto regression (VAR) systems to incorporate financial market variables into a framework for stress testing the stability of the banking system. The attempt is to design an integrated micro-macro model that takes into account dynamic linkages between the health of the financial system and macro-financial conditions<sup>4</sup>.

28. Coordinated stress tests are, thus, being used to estimate the losses that a group of financial institutions, typically the banking system, could suffer under adverse macroeconomic developments. Such stress tests offer an overall assessment of the vulnerability of the banking system over a defined time period. They are also important tools for the individual banks themselves and for their micro prudential supervisors *e.g.* from the perspective of capital planning and ensuring the resilience of individual financial institutions.

29. In the aftermath of the Global crisis, financial sector regulators initiated various types of coordinated disclosures of bank exposures, stress test results and similar metrics to rebuild trust in the financial sector. Prominent examples of such disclosures are the *2009 Supervisory Capital Assessment Program in the United States*, followed by the disclosure of the stress scenario projections of the *Comprehensive Capital Analysis and*

*Review* in 2012. Similarly, the European Banking Authority and its predecessor, the Committee of European Banking Supervisors, conducted EU-wide stress tests from 2009, disclosing the disaggregated results. The stress testing exercises focused on assessing the resilience of both individual banks and the EU banking system as a whole to possible adverse economic developments, while the capital exercise estimated banks' recapitalisation needs to meet a target capital ratio. These initiatives marked the beginning of disclosures of firm level data on stress tests in contrast to the disclosure of sectoral or aggregate data as has been the earlier practice. The aim was to enhance market transparency at a time of prevailing uncertainty and to provide market participants with the necessary information to conduct their own risk assessments.

### ***(iii) Developing early warning framework***

30. The third set of models I will discuss today relates to the coincident stability indicators which are used to evaluate prevalent conditions of financial stability. These indicators assess the movements in a range of factors which could have a bearing on financial stability and aid in measuring how risks develop over time and in putting in place an early warning framework.

31. Several types of indicators are being developed in this context. Macroeconomic indicators are typically compiled at the country level and measure changes in macroeconomic data. These include measures such as GDP growth, growth in total credit, inflation, unemployment, measures of external sector balance such as the current account deficit and measures of fiscal imbalances. Another class of indicators uses aggregated data pertaining to financial institutions representing developments in the financial sector's assets and earnings. Banking sector indicators examine the risks emanating from the banking sector, given the typical importance of this sector for financial stability. These indicators examine the movements in financial soundness indicators of the banking system to assess how risks posed by the banking system are evolving. Another set of indicators examine conditions in financial markets.

32. Five years on, there is clearly no widely accepted single indicator or model capturing systemic risks and

<sup>4</sup> 'A Framework for Assessing the Systemic Risk of Major Financial Institutions' (Apr 2009), Xin Huang, Hao Zhou and Haibin Zhu, BIS Working Papers, No 281

instabilities comprehensively. Most models/techniques that have been developed cover one or a few specific aspects of systemic risk. Each measure is an approximation and each has its own strengths and weaknesses. No single measure is complete in all aspects in a macroprudential context and policy-makers need, therefore, to rely on a wide range of measures and tools, covering various segments of financial systems and various types of shocks and transmission mechanisms. The challenge remains one of constructing a comprehensive systemic risk surveillance and assessment system which serves as an effective early warning system.

## V. Institutional and Governance Arrangements

33. Institutional and governance arrangements for ensuring financial stability is another critical issue. The overlap between macro prudential and monetary policies raises questions about the role of central banks in financial stability both in peace as well as crisis time. The broad consensus which has emerged is that central banks must be involved in the formulation and execution of financial stability policy, exclusively or as part of a collegial arrangement.

34. Much work has been undertaken over the last two years on the design of financial stability policy and related governance arrangements in some of the world's major jurisdictions. Abstracting from details, the amendments to the regulatory and oversight architecture made in different jurisdictions have, *inter alia*,

- designated the central bank as the systemic regulator with accountability;
- placed central banks in charge of micro prudential regulation, where not already so responsible, in addition to macro prudential regulation, especially with respect to systemically important financial institutions;
- set up financial stability councils/commissions to provide high level focus on financial stability.

35. Let me recapitulate some of these changes. The reform of supervisory arrangements in the European

Union (EU) drew largely upon the report of the de Larosière Group. In the second half of 2009, the European Commission presented two sets of legislative proposals that saw the creation of two new pan-European authorities for micro prudential and macro prudential supervision. For micro prudential supervision, the European System of Financial Supervisors (ESFS) was established which brings together the national supervisors and three new independent supranational European Supervisory Authorities (ESAs) set up replacing the former European committees for the banking, securities, and insurance and occupational pensions sectors. With respect to macro prudential oversight, a European Systemic Risk Board (ESRB) was created and tasked with detecting risks to the financial system as a whole. Though the ESRB has no formal directive power, it can issue recommendations and risk warnings to EC member states, to national supervisors and to the ESAs, all of which will be expected to comply or else explain.

36. In Mexico, a Financial Stability Council (FSC) was established. The FSC comprises the Bank of Mexico, the Finance Ministry and the country's other principal regulatory agencies and is tasked with the identification of potential risks to the country's financial stability, recommending appropriate policies and actions, and coordinating their implementation by member agencies.

37. The Bank of Korea Act was amended in August 2011. The amendment, *inter alia*, granted the Bank of Korea a financial stability mandate that calls on it to play a more proactive role in financial stability.

38. With the introduction of the Central Bank of Malaysia Act 2009, the 1958 version of the Act was repealed. The 2009 Act provides greater clarity on the Bank Negara Malaysia's mandate for financial stability and granted it specific powers for macro-prudential financial stability, including for crisis prevention, management and resolution.

39. In the United Kingdom, the Banking Act 2009 introduced a new special resolution regime and entrusted the Bank of England with a statutory objective for financial stability. The financial sector reforms

envisaged replacing the United Kingdom's current tripartite institutional framework by a new framework integrating macro- and micro prudential oversight within the Bank of England. The reforms focus on three key institutional changes: Creation of a Financial Policy Committee within the Bank of England as a formal committee of its Court of Directors and tasked with responsibility for delivering systemic financial stability through macroprudential regulation. Second, an operationally independent subsidiary of the Bank, the Prudential Regulation Authority (PRA), will be responsible for day to day supervision of financial institutions that manage significant risk on their balance sheet. Third, a new specialist regulator, the Financial Conduct Authority (FCA), which will have responsibility for conduct of business issues across the entire spectrum of financial services.

40. The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 was passed by US Congress with the objective of promoting financial stability by improving accountability and transparency in the financial system, ending 'too big to fail', protecting the American taxpayer by ending bailouts, and protecting consumers from abusive financial services practices. Under the Act, the extant American system of multiple supervisors continues. However, a new Financial Stability Oversight Council (FSOC) under the chairmanship of the Treasury Secretary was created to identify systemic risks and gaps in supervision, and to recommend regulatory enhancements. Though the Federal Reserve's role in the FSOC is not apparently very prominent, it has become the primary regulator for systemically important entities, thus expanding its supervisory role beyond large bank holding companies.

41. In India, the Financial Stability and Development Council has been set up but I will discuss this a little later.

42. Financial stability would require governance arrangements to ensure independence of the macro prudential regulator, clarity of objectives and mandates and accountability.

## **VI. Financial Stability: The Indian Context**

43. In India, prior to the crisis, no agency had explicit mandate for financial stability though the Reserve Bank

acted as the implicit systemic regulator for the country. The Reserve Bank of India Act, 1934 provides a broad legal mandate to the Reserve Bank to secure monetary stability and generally to operate the currency and credit system of the country to its advantage. In practice, this meant the dual objective of growth and price stability, the relative emphasis being dependent on the context. In 2004, the Reserve Bank formally added financial stability as an additional objective in view of the growing size and importance of the Indian financial sector. The broad compulsions of financial stability had, however, underlined all major policy initiatives of the Reserve Bank especially since the balance of payment crisis of the early 1990s – much ahead of the articulation of financial stability as an objective. Manifestation of the focused attention of the Reserve Bank on financial stability is evidenced in its approach towards financial sector regulation over the last couple of decades. Let me touch upon some of these.

### ***The banking sector***

44. The gradual process of introducing structural reforms in the banking sector was undertaken with the key objective of strengthening the banking sector balance sheets and governance frameworks in a non-disruptive manner. The reforms were carefully sequenced with prudential norms and supervisory strengthening introduced early in the reform cycle, followed by interest rate deregulation and gradual lowering of statutory preemptions. The more complex aspects of legal and accounting measures were ushered in subsequently. The regulatory framework has also focused on ensuring good governance through 'fit and proper' owners, directors and senior managers of the banks.

### ***The non-banking financial sector***

45. India is unique with respect to the non-banking financial sector being within the regulatory perimeter, in sharp contrast to many jurisdictions which are grappling with the very complex issue of regulating the shadow banking sector. Regulation of Non-Banking Finance Companies in India was considered necessary as far back as the sixties as a corollary to the monetary



and credit policy of the country and protection of depositors' interest. Statutory powers for the regulation of the segment were given to the Reserve Bank through the RBI (Amendment) Act in January 1997. The initial focus of the Reserve Bank was on depositor protection and stringent regulatory requirements were put in place for deposit taking entities. With the growth of the financial system, the focus shifted to non-deposit taking entities which could pose systemic risks on account of their interaction with the formal banking system and market based financing. A gradually calibrated regulatory framework was created for these entities.

### ***Large and complex financial institutions***

46. As liberalisation led to the emergence of financial conglomerates cutting across sectors and geographical boundaries, a need for a framework for monitoring of Systemically Important Financial Intermediaries (SIFIs) or Financial Conglomerates was seriously felt. Accordingly, a Financial Conglomerates (FC) Monitoring Mechanism was put in place in India since June 2004 and is being continuously upgraded.

### ***Macroprudential Regulation: Addressing systemic risks***

47. The Reserve Bank has, over the years, attempted to address both aspects of systemic risks – the time dimension (which essentially refers to procyclicality) and the cross sectional dimension (which refers to interconnectedness) within a macro prudential framework, without christening these policies as macro prudential policies. Operationally, India being a bank-dominated economy, the bank credit and credit growth have always formed important variables in the conduct of monetary and countercyclical policies.

48. In addressing systemic risks in the time dimension, Reserve Bank's countercyclical policies have aimed at increasing the resilience of the banking system. The instruments used have been time varying risk weights and provisioning norms on standard assets for certain specific sectors wherein excessive credit growth, led to apprehension about potential build-up of systemic risk. A slew of regulatory measures, including prudential exposure limits, address systemic risks arising out of inter-connectedness among banks and between banks and NBFCs and from common exposures.

### ***Financial markets***

49. The development of financial markets was pursued by the Reserve Bank in the broader context of financial stability. A calibrated approach to financial sector development was adopted based on the level of maturity of the financial system and the needs of the real economy. Delicate balance between fostering growth by encouraging financial innovation vis-à-vis the imperative of containing excesses that could lead to instability was meticulously observed. The approach was to ensure that finance remains firmly wedded to the real sector and does not assume dynamics of its own. New products were permitted after due deliberations and wide consultations so as to take into account both the requirements of the participants as also the preparedness of the system for managing the risks.

### ***OTC derivative markets***

50. The regulatory stance is of a cautious approach to introduction of complex financial products. Structured derivative products are permitted only as long as they do not contain any derivative which is not allowed on a standalone basis. In India, a CCP existed, even prior to the crisis, for the critical interest rate and foreign exchange markets. Reporting arrangements are in place for other OTC derivative products. This approach has been appreciated globally and the Reserve Bank of India was recently awarded the 2012 Dufrenoy Prize for its precautionary approach to the regulation of derivatives market, thus facilitating financial innovation in a responsible manner.

### ***Capital account management***

51. The approach of the Reserve Bank to the management of the capital account also evolved from the broader objective of maintaining financial and macroeconomic stability. The policy framework included an explicitly stated active capital account management framework, based on the policy stance of encouraging non-debt creating and long-term capital inflows and discouraging debt flows. At the same time, there was significant liberalisation of permissible avenues for outward investments for domestic entities.

### ***Organisational arrangements for financial stability***

52. Organisational developments within the Reserve Bank, over the last couple of decades, have also reflected the Bank's commitment to maintaining financial stability. Two separate Committees of the Reserve Bank's Central Board, *viz.*, the Board for Financial Supervision (BFS) and the Board for Payment and Settlement Systems (BPSS), are responsible for focused regulation and supervision of financial institutions regulated by the Reserve Bank and the payment and settlement infrastructure, respectively. Towards ensuring a coordinated approach to the supervision of the financial system, a High Level Coordination Committee on Financial Markets (HLCCFM) was functional since 1992 with the Governor of the Reserve Bank as Chairman, the Finance Secretary, Government of India and the heads of other regulatory authorities such as the Securities and Exchange Board of India (SEBI), the Insurance Regulatory and Development Authority (IRDA) and the Pension Funds Regulatory and Development Authority (PFRDA) as members. Post crisis, a Financial Stability and Development Council (FSDC) has been set up to provide focussed attention to the pursuit of financial stability. The Council is chaired by the Finance Minister and has representation from all the financial sector regulators. However the oversight of systemic risk in normal times is with a Sub Committee of the FSDC (which replaced the HLCCFM) chaired by the Governor, Reserve Bank of India and having, as members, heads of other regulatory agencies as well as all the Deputy Governors of Reserve Bank of India and the Finance Secretary.

53. In July 2008, the Reserve Bank set up a Financial Stability Unit (FSU) with a mandate to, *inter alia*, conduct effective macro-prudential surveillance of the financial system on an ongoing basis to enable early detection of any incipient signs of instability. With the establishment of the FSU, the Reserve Bank started publication of half yearly Financial Stability Reports (FSRs) – which now forms a critical tool for the Reserve Bank in its attempt to communicate the potential systemic risks facing the financial system.

### ***Financial Stability analytics***

54. A number of initiatives have been taken to improve the financial stability analytics to take full account of the different sources of systemic risk. A series of indicators and indices have been developed to assess the health and resilience of the financial system on an ongoing basis.

55. A Banking Stability Indicator is being used by the Reserve Bank to monitor the dimensional riskiness of the banking system in the country. It presents an overall assessment of changes in the underlying conditions and risk factors having a bearing on the stability of the banking sector based on the five dimensions of, soundness, asset quality, liquidity, profitability and efficiency. A Financial Stress Indicator – a contemporaneous indicator of conditions in the equity, foreign exchange and interest rate markets and in the banking sector – has been developed to assess the degree of stress in the financial system and to forecast market conditions in the near term.

56. Imbibing the lesson from the global financial crisis about the importance of interconnectedness in the financial system, a model of the bilateral exposures in the banking system and the broader financial system has been developed with a view to assess the degree of interconnectedness in the system and to analyse the possible contagion impact of the idiosyncratic failure of a bank. The model uses cutting edge techniques in analysing the network of the Indian financial system and identifying, on a real time basis, buildup of excesses and risk concentrations, if any.

57. Advanced stress testing techniques are being used to assess the resilience of the financial sector. A series of Banking Stability Measures (in the form of Banking System's Portfolio Multivariate Density), including a 'Toxicity Index', a 'Vulnerability Index' and 'Cascade' effects have been developed for the purpose of assessing the systemic importance of individual banks<sup>5</sup>. Also, the impact of macroeconomic shocks on the

<sup>5</sup> 'Central banking in a balance sheet recession', Panel remarks by Mr Jaime Caruana, General Manager of the BIS, at the Board of Governors of the Federal Reserve System 2012 conference on 'Central banking: before, during and after the crisis', Washington, 23-24 March 2012.

stability of the banking system is being assessed based on the Vector Autoregression (VAR) approach.

58. Thus, in the case of the Reserve Bank of India, the focus on financial stability from the policy perspective attempts to put in place a prudential framework aimed at strengthening the resilience of the financial sector while also ensuring that the financial sector development is designed to correspond to the level of maturity of the financial system and the needs of the real economy. Simultaneously, advanced tools and techniques are being employed to put in place an effective system of macroprudential surveillance of the financial system.

59. In discharging its function towards maintaining financial stability, the Reserve Bank derives considerable systemic advantage from its roles as the monetary authority, lender of last resort, regulator of the banking and non banking system and of key financial markets – money market, Government securities market, forex market and credit market. From a financial stability perspective, the above framework has proved to be a sound model as evidenced by the resilience of the Indian financial system during various episodes of systemic instability in the global economy.

## VII. Challenges – Going Forward

60. It would perhaps be a truism to state that the last five years have been challenging. Challenging in terms of the continuing instability which has dogged the global financial system with barely a respite. Challenging in terms of the sheer breath of regulatory changes which have taken place over a relatively short span of time – changes which are far reaching, changes which encompass a wide span, changes which are historic. I strongly believe that the next five years will be equally exciting though, I hope, less stressful for the global financial system.

61. The last few years have also been defining moments in the history of central banking. The crisis has raised questions about the functioning of central banks leading up to the crisis and has presented tough challenges in steering the global financial system out of the crisis. For central banks, just as managing the crisis was difficult, managing the recovery is going to be equally, if not more, difficult. One of the most

important challenges I see in the days to come is that of exit from accommodative policies adopted during the crisis management phase and to ensure that the financial imbalances which led to crisis do not build up again. But the policies that are most suited to crisis management are not necessarily the best for crisis resolution<sup>6</sup>. In recent periods, the extraordinarily easy monetary policies in advanced countries have provided some relief, but, sooner or later, central bank balance sheets will have to be repaired. The main challenge for policy makers will then be to prevent such balance sheet recession/repair from spilling over to protracted economic weakness.

62. When the dust from this crisis has settled, the biggest challenge, going forward, would remain preventing the buildup of financial instability when there would be stability, as risk is highest in the system when the perceived risk is lowest. Tough decisions are difficult to sustain and to implement, when memory recedes – and human memory is notoriously fickle.

63. An impressive range of regulatory reforms have been set in motion in the five years since the crisis first unfolded. But there are formidable implementation challenges ahead which will need to be carefully managed. The progress in certain areas of reforms, notably OTC derivative market reforms and measures to put in place robust resolution regimes, has been slow. There are apprehensions about the impact of the Basel III capital measures on credit offtake as well as on investor interest in the banking system. There are also concerns about the impact of the Basel III liquidity measures on the functioning of the markets for such securities. The potential unintended consequences of the reform measures, especially for emerging markets, will need to be carefully monitored and managed, should they emerge.

64. The years ahead will also be very exciting in terms of development of financial stability analytics. While we have made progress, financial system modelling is still in its infancy and the critical lesson that the crisis

<sup>6</sup> 'Central banking in a balance sheet recession', Panel remarks by Mr Jaime Caruana, General Manager of the BIS, at the Board of Governors of the Federal Reserve System 2012 conference on 'Central banking: before, during and after the crisis', Washington, 23-24 March 2012.

has taught us is that understanding, preventing and reducing systemic risks, as we seek to preserve financial stability, deserve our full fledged attention.

65. Let me conclude. There is a downside risk to global financial stability. In India though the financial system remains robust, the downside risks to financial stability have increased due to several global and domestic factors. As I said earlier, financial stability is a shared responsibility and therefore, Indian banks have a major role to play because while strong financial institutions need not necessarily make up a strong financial system, for a strong financial system we would need strong banks. Indian banks are facing several challenges in the current scenario – implementation of Basel III and for some, implementation of Advanced Approaches of Basel II – in a situation where there is increasing

pressure on asset quality. While the macro economic situation would certainly have an impact on NPAs, this can still be contained by substantially upgrading the credit management systems so as to be able to contain slippages and improve recovery. Overall, improvement in risk management systems, upgradation of technological platforms and building up of specialised skills in the banking system are the challenges which will distinguish the more successful ones from the others. It is important and this is a lesson from the recent crisis that the competitive pressures are not allowed to override basic prudence. I am sure that our banking system will rise above the formidable challenges and emerge stronger and more efficient. I wish the Conference all success.

Thank you