

Financial Stability

Following the global financial crisis, financial stability has emerged as an important objective of central banks across countries in the world - both developed and emerging market economies (EMEs). Unlike monetary policy frameworks, it is difficult to define financial stability framework. There are conceptual and measurement issues. A number of countries, however, have initiated financial stability analysis in terms of undertaking financial stability reports to assess the risks and outlook for financial stability. Along with a discussion of these issues, this chapter recounts the Indian experience with financial stability alongside price stability. While the traverse so far has been successful, way ahead, as is the case globally, there are significant challenges in attaining the objectives of financial stability as India gets further globalised.

1. Introduction

7.1 Following the global financial crisis, financial stability has emerged as an important objective of central banks across countries in the world – both developed and EMEs, notwithstanding the long period of macro-economic stability in terms of growth and inflation. The crisis occurred on a massive scale leading to the collapse of the financial markets and institutions bringing the financial stability issues to the forefront of policy discussions.

7.2 On the hindsight, the present crisis appears to be a result of a macroeconomic environment with a prolonged period of low interest rates, high liquidity and low volatility, which led financial institutions to underestimate risks, a breakdown of credit and risk management practices in many financial institutions, and shortcomings in financial regulation and supervision. A slowdown in the US real estate market triggered a series of defaults and this snowballed into accumulated losses, especially in the case of complex structured securities. The US subprime crisis has led to both the strained conditions of financial markets and the slowdown of the broader economy. The US economy continues to confront substantial challenges, including stresses in financial markets, a weakening labour market and deteriorating economic

activity. The problems intensified significantly around mid-September 2008, when major losses led to failure of major financial institutions, namely Lehman Brothers, Merrill Lynch, Fannie Mae and Freddie Mac.

7.3 It was the abrupt breakdown of trust following the collapse of Lehman Brothers in mid-September 2008 that caused financial markets in advanced economies to go into seizure. Suddenly, there was a great deal of uncertainty not only about the extent of losses and the ability of banks to withstand those losses, but also about the extent of risk in the system, where it lay and how it might explode. This uncertainty triggered unprecedented panic and almost totally paralysed the entire chain of financial intermediation. Banks hoarded liquidity. Credit, bond and equity markets nearly froze. Signaling a massive flight to safety, yields on Government securities plunged while spreads over risk free Government securities shot up across market segments. Several financial institutions came to the brink of collapse. Massive deleveraging drove down asset prices setting off a vicious cycle. Trust totally dried up.

7.4 Although the epicentre of the crisis lay in the advanced economies, it soon spread in two directions. In the advanced economies, it spread from the financial sector to the real sector severely hurting consumption,

investment, export and import. It spread geographically from the advanced economies to the EMEs and soon engulfed almost the entire world through trade, finance and confidence channels.

7.5 Among the several lessons of the crisis, prominent ones with respect to financial stability are: first, financial stability that had grown to be taken for granted cannot be taken for granted; second, financial stability can be jeopardised even if there is price stability and macroeconomic stability; third, financial stability anywhere in the world is potentially a threat to financial stability everywhere; and finally, financial stability has to shift from being an implicit variable to an explicit variable of economic policy¹.

7.6 Central bankers around the world are clearly in the forefront battling the crisis. While they are clearly a part of the solution, questions are being asked about whether they were, in fact, part of the problem. Over the past two decades, revisions to the monetary policy framework appear to have been successful in the combat of inflation in a number of countries. Over the same period, financial stability frameworks have not kept pace.

7.7 Financial stability failed to receive central bank attention it warranted. The risks to financial stability were brewing silently as manifested in growing threats from macro economic imbalances, asset price build up, credit expansion and depressed risk premia. But central banks largely refrained from strong corrective action for a variety of reasons such as the perceived inefficiency of monetary policy to redress asset price bubbles, separation of monetary and regulatory policies, and misplaced faith in the self-correcting forces of financial markets.

7.8 In contrast to the global scenario, India has by-and-large been spared of the global

financial contagion. Even in the midst of the crisis, India's financial sector remained safe and sound and financial markets continued to function normally. There can be a variety of reasons. The credit derivatives market is in an embryonic stage; the 'originate-to-distribute' model in India is not comparable to the ones prevailing in advanced markets; there are restrictions on investments by residents in such products issued abroad; and regulatory guidelines on securitisation do not permit immediate profit recognition. Financial stability in India has been achieved through perseverance of prudential policies which prevent institutions from excessive risk taking, and financial markets from becoming extremely volatile and turbulent. As a result, while there are orderly conditions in financial markets, the financial institutions, especially banks, reflect strength and resilience. While supervision is exercised by a quasi-independent Board carved out of the Reserve Bank's Board, the interface between regulation and supervision is close in respect of banks and financial institutions and on market regulation, a close coordination with other regulators exists.

7.9 In this perspective, spread over eight sections, this chapter addresses the primary question of conceptual aspects of financial stability and its measurement in Section 2; an account of financial stability analysis by the central banks through the 'Financial Stability Reports' in Section 3; Global Initiatives towards Financial Stability in Section 4; an assessment of the India's financial system in Section 5; domestic financial markets are discussed in Section 6; Section 7 discusses India's approach to financial stability explaining how India achieved this in the last two years. Key sources of vulnerability of Indian financial system are also addressed in this Section. Section 8 concludes the chapter with an overall assessment and challenges to financial stability on the way forward.

¹ Subbarao, D (2009), 'Financial Stability – Issues and Challenges', Valedictory Address at the FICCI-IBA Annual Conference in Mumbai on 'Global Banking: Paradigm Shift' on September 10.

2. Financial Stability: Concept and Measurement

7.10 The challenge of monetary policy is to strike an optimal balance between preserving financial stability, maintaining price stability, anchoring inflation expectations, and sustaining the growth momentum². The relative emphasis between these objectives has varied from time to time, depending on the underlying macroeconomic conditions. The global financial crisis has underlined the importance of preserving financial stability and this has made the task for the conduct of monetary policy even more complex and challenging than before.

What is Financial Stability?

7.11 Financial stability, as a concept, is widely known. However, there is no unanimous agreement on a working definition of this concept. Some define financial stability in terms of what it is not, *i.e.*, the absence of financial instability. Others take a macro-prudential view and specify financial stability in terms of limitation of risks of significant real output losses in the presence of episodes of system-wide financial distress. Financial stability is a situation in which the financial system is capable of satisfactorily performing its three key functions simultaneously. First, the financial system is efficiently and smoothly facilitating the inter-temporal allocation of resources from savers to investors and the allocation of economic resources in general. Second, forward-looking financial risks are assessed and priced reasonably accurately and are relatively well-managed. Third, the financial system is in such a condition that it can comfortably, if not smoothly, absorb financial and real economic surprises and shocks. If any one or more of these key functions are not being satisfactorily

performed. It is likely that the financial system is moving in the direction of becoming less stable, and at some point might exhibit instability. For example, inefficiencies in the allocation of capital or shortcomings in the pricing of risk can, by laying the foundations for imbalances and vulnerabilities, compromise future financial system stability.

Why Study Financial Stability?

7.12 Since the early 1990s, safeguarding financial stability has become an increasingly dominant objective in economic policy making. Financial stability has been stated as a public good³. The greater emphasis on financial stability is related to several major trends in the financial system, reflecting the expansion of liberalisation and subsequent globalisation of financial system, all of which have increased the possibility of larger adverse consequences of financial instability on economic performance. First, financial systems have expanded at a significantly higher pace than the real economy. Second, this process of financial deepening has been accompanied by changes in the composition of the financial system, with a declining share of monetary assets and increasing share of non-monetary assets, and by implication, greater leverage of the monetary base. Third, as a result of increasing cross-industry and cross-border integration, financial systems have become more integrated, both nationally and internationally. Fourth, the financial system has become more complex in terms of the intricacy of financial instruments, the diversity of activities and the concomitant mobility of risks. In general, the greater complexity, especially the increase in risk transfers, has made it more difficult for market participants, supervisors, and policy makers alike to track the development of risks within the system and over time. Notwithstanding the

² Governor, Dr. D. Subbarao's Press Statement on Stance of Monetary Policy for the Remaining Period of 2008-09, October 24, 2008.

³ Selinasi, Garry J. (2006), 'Safeguarding Financial Stability: Theory and Practice', IMF, Washington.

contribution of the above trends to economic efficiency, they have had implications for the nature of risks and vulnerabilities in the financial system and its potential impact on real economy, as well as for the importance of financial stability in policy making.

7.13 Unlike monetary stability, which is measured by inflation and monetary indicators, financial stability is not easy to define or measure given the inter-dependence and the complex interactions of different elements of the financial system among themselves and with the real economy. This is further complicated by the time and cross-border dimensions of such interactions. Financial stability, thus, is not well defined and cannot be easily measured.

3. Central Banks and the Financial Stability Reports

7.14 Conceptual and measurement issues with regard to financial stability notwithstanding, over the past two decades, researchers from central banks and elsewhere have attempted to capture conditions of financial stability through various indicators of financial system vulnerabilities. Indeed, many central banks through their Financial Stability Reports (FSRs) attempt to assess the risks to financial stability by focusing on a small number of key indicators. Both types of central banks, those focussed on single objective such as price stability and those focused on multiple objectives, such as economic progress, price stability and sound and strong external sector, publish FSRs (Box VII.1 and Annex VII.1).

7.15 Moreover, there are ongoing efforts to develop a single aggregate measure that could indicate the degree of financial fragility or stress. Composite quantitative measures of financial system stability that could signal these conditions are intuitively attractive as they could enable policy makers and financial system participants to: (a) better monitor the degree of financial stability of the system, (b) anticipate

the sources and causes of financial stress to the system and (c) communicate more effectively the impact of such conditions.

7.16 Composite indicators of financial stability are better suited for the definition of threshold or benchmark values to indicate the state of financial system stability than individual variables. Moreover, they are useful measures of stress (*e.g.*, they can be used to gauge the build-up of imbalances) in the system even in the absence of extreme events. However, the construction of a single aggregate measure of financial stability is a difficult task given the complex nature of the financial system and the existence of its complex links between various sectors. In the absence of an overarching aggregate, partial composite measures, such as a banking stability index or a market liquidity index are used in several FSRs. Regardless of whether a single aggregate measure of financial stability is constructed or not, FSRs would need to analyse key variables in the real, banking and financial sectors as well as variables in the external sector.

7.17 There is some diversity in construction and use of the key indicators. For broader cross-country comparisons, it would be useful to have an appropriate template and methodology for such indicators, although individual circumstances of countries make such an exercise difficult (due, notably, to the varying relative importance of individual financial system components and to differing degrees of openness of the economies concerned). If one tries to compute a single aggregate measure of financial stability, the weightings of the different variables that constitute such an aggregate measure have to reflect these differences accordingly.

7.18 Although some central banks have experimented with computing single aggregate measures of financial stability, no such measures can be used without knowledge and use of other quantitative or qualitative instruments. Moreover, single aggregate measures reflect the

Box VII.1: Financial Stability Reports of Central Banks: Comparative Assessment

A review of the FSRs brought out by various central banks shows that as many as 67 central banks across the developed and the emerging market economies are periodically publishing a separate report on the subject of financial stability (Annex to the Chapter). The first standalone FSR was published in 1996 in the UK, which was followed by several Nordic countries. Since then, the number of central banks publishing FSRs grew to 25 in 2004 and further to 67 in 2008. Out of these, a majority of the central banks publishing FSRs belong to Europe. Some of the Asian countries that publish FSRs include Japan, Korea, Hong Kong SAR, Singapore, China, Philippines, Indonesia and lately, Malaysia. Recently, a few African (Ghana, Kenya and South Africa) and Middle East (Israel and Qatar) countries have also begun publishing FSRs. In the south Asian region, India's neighbouring countries like Pakistan, Sri Lanka and Bangladesh are also publishing such reports.

While many multilateral institutions/central banks such as the International Monetary Fund (IMF), the Bank for International Settlements (BIS), the Basel Committee on Banking Supervision, the Group of Twenty, the International Association of Insurance Supervisors and the European Central Bank (ECB) deal with financial stability related issues, standalone FSRs are brought out regularly by only two such institutions, namely, the IMF and the ECB.

Central banks publish financial stability reports for various reasons. Based on a survey, Oosterloo and Haan (2004), state that there are three main reasons for publishing the assessment of financial stability in the form of a FSR: (i) to contribute to the overall stability of the financial system; (ii) to strengthen cooperation on financial stability issues between the various relevant authorities; and (iii) to increase the transparency and accountability of the financial stability function.

It seems that for most central banks the ultimate objective of FSRs is their contribution to financial stability. According to the Bank of England, the Financial Stability Review aims: (i) to promote the latest thinking on risk, regulation and financial markets; (ii) to facilitate discussion of issues that might affect risks to the UK financial system; and (iii) provide a forum for debate among practitioners, policy makers and academics. Articles published in the Financial Stability Review, whether written by the Bank or Securities and Investment Board (SIB) staff or by outside contributors, are intended to contribute to the debate, and are not necessarily statements of the Bank or SIB policy. According to Banque de France, in a globalised and increasingly complex financial environment, assessing and fostering financial stability requires strengthened co-operation between the various relevant authorities *viz.*, Governments, central banks, market regulators and supervisors. They also presuppose that a close dialogue to be maintained with all financial sector professionals. It is in this spirit that the

Banque de France, like several other central banks, has decided to publish a periodic Financial Stability Review. According to the ECB, in publishing this Financial Stability Review, the ECB is joining a growing number of central banks around the world that are addressing their financial stability mandates in part through the periodic issuing of a public report. The purpose of publishing this review is to promote awareness in the financial industry and among the public at large of issues that are relevant for safeguarding the stability of the euro area financial system. By providing an overview of sources of risk and vulnerability to financial stability, the review also seeks to help prevent financial tensions. A similar view is echoed by central banks in some emerging economies. According to the central bank of Brazil, the practice of central banks publishing analyses of financial system performance is highly recommended from the point of view of monetary authority's transparency and the expectations of economic agents. According to the Singapore Monetary Authority, the Financial Stability Review analyses the risks and vulnerabilities arising from domestic and global developments and assesses their implications for the soundness and stability of the domestic financial system. The FSR aims to contribute to a greater understanding and exchange of views among market participants, analysts and the public on issues affecting the country's financial system.

Some FSRs explicitly recognise reduction of financial instability as their ultimate objective. According to the Bank of Canada, FSRs one avenue through which it seeks to contribute to the longer-term robustness of the domestic financial system. It can do so by: (i) improving the understanding of (and contributing to dialogue on) risks to financial intermediaries in the economic environment; (ii) alerting financial institutions and market participants to the possible collective impact of their individual actions; and (iii) building a consensus for financial stability and the improvement of the financial infrastructure. An FSR can add value to work undertaken by private agents in the financial sector itself, because a central bank can draw on its macroeconomic expertise and its role in payments and settlements. Also, private agents do not have as strong an incentive to assess the systemic risks in the economic environment, as they are less interested in spillovers of their actions on to other agents. Finally, there is a need to educate the public about the costs of infrequent but catastrophic episodes of instability (analogous to the need of the monetary policy side to build a constituency for low inflation).

Reference:

1. Financial Stability Reports of various Central Banks.
2. Oosterloo, S. and J. de Hann (2003), 'A Survey of institutional frameworks for financial stability', De Nederlandsche Bank Occasional Studies, Vol.1, No. 4.

financial system conditions well post facto, it is not yet clear how well they would perform in signaling the onset of financial stress.

7.19 Generally, central banks derive financial stability responsibility from four principal areas: (i) regulation and supervision of banking sector; (ii) oversight of the payment system; (iii) the lender of last resort function; and (iv) an integral and major element of the coordinated framework encompassing multiple regulators for the achievement of overall stability of the financial system. First, directly as regulator and supervisor of deposit taking commercial banks and also deposit taking non-banking institutions, several central banks are entrusted with the responsibility for a sound, safe and stable financial system. Moreover, the deposit taking banks and non-bank entities constitute the major pillar of financial system due to their dominant role in intermediation of savings and deployment of resources for investment, and the stability of key institutions and markets assume critical importance for the stability of whole financial system. Second, central banks have a key role in promoting a safe and efficient payment and settlement system. According to the Riksbank of Sweden, the payment system is important for all economic activities and is a central component of the financial system. For that reason, the Riksbank regularly analyses the risks and threats to the stability of the Swedish payment system. Third, central banks, due to their lender of last resort function, assume critical importance in providing liquidity support for mitigating the financial crisis. According to the Peoples' Bank of China (PBC), the central bank of a country has a 'natural role' in maintaining financial stability, as it is the lender of last resort and plays an important role in maintaining liquidity in the financial system. Fourth, in some countries where the banking regulation and supervision is vested in a separate authority and the stability of the financial system entrusted to a super regulator or umbrella organisation which coordinates

with various types of financial regulators, central banks are accorded a dominant position in this framework. From operational angle, some central banks serve as chairman of the coordinated system for financial system stability. Illustratively, in Australia, the Council of Financial Regulators which brings together the Treasury – the fiscal authority, the central bank – the monetary authority, Australian Prudential Regulation Authority – the banking regulator and the Australian Securities and Investments Commission (ASIC) – the capital market regulator, is chaired by the Governor of the Reserve Bank of Australia (RBA). Thus, the RBA is entrusted with the ultimate responsibility to contribute to the efficiency and effectiveness of regulation and the stability of the financial system.

7.20 Globally, financial stability has assumed significance because of the tendency of financial turbulence to spill across borders. This is amply illustrated by the ongoing crisis which has brought the issue of financial stability to the forefront. What started as a sub-prime crisis in the US housing mortgage sector has turned successively into a global banking crisis, global financial crisis and now a global economic crisis. Apart from the current one, in recent years, crises in Mexico (1994), Asia (1997), Turkey (1999) and Argentina (2001) entailed significant costs to the countries concerned and also exerted serious corollary damage on neighbouring countries, which induced Governments and multilateral institutions to be more proactive in preventing and resolving financial crises. Even as countries across the globe are trying to come to terms with what is purportedly the biggest downturn in economic activity since the Great Depression, the world over there is renewed emphasis on maintaining financial stability. Some of the factors that can lead to financial instability include unsustainable macroeconomic policies, fragile financial systems, regulatory gaps, institutional weaknesses and flaws in the structure of the

international financial architecture. It is recognised that there is no fail-safe method for ensuring financial stability as volatility is an intrinsic feature of financial markets. It is, however, desirable to take preventive measures so as to reduce the incidence of disruptive and costly financial crises. Thus, countries need to be vigilant about and take initiatives to address each of the five causes of financial instability enumerated above. This would include limiting macroeconomic sources of financial vulnerability, strengthening the financial infrastructure and undertaking swift remedial measures for early and quick resolution of financial crises, if and when they occur.

7.21 There are various issues relating to central banks' financial stability goal, mandate in publishing FSR, the title of the report, commencement, periodicity and size of the publication, dissemination policy, chapterisation scheme, coverage and the methodology used in the various reports. There are also issues about whether the central bank that brings out FSR is a bank regulator or not

and whether financial stability is a mandated function of the central bank through any legislative framework (Annex VII.1).

7.22 Policymakers and academic researchers have focused on a number of quantitative measures in order to assess financial stability. The set of Financial Soundness Indicators developed by the IMF (2006) are examples of such indicators apart from monitoring variables which focus on market pressures, external vulnerability and banking system vulnerability. Annex VII.2 summarises the measures commonly used in the literature, their frequency, what they measure, as well as their signaling properties. As can be seen, the focus is on six main sectors (Box VII.2 and Annex VII.2).

7.23 Typically financial stability analysis would use several sectoral variables either individually or in combinations. The use of such measures including the financial soundness indicators as key indicators of financial stability depends on the benchmarks and thresholds which would characterise their behaviour in

Box VII.2: Key Financial Stability Segments and Variables

Firstly, the *real sector* is described by GDP growth, the fiscal position of the Government and inflation. GDP growth reflects the ability of the economy to create wealth and its risk of overheating. The fiscal position of the Government mirrors its ability to find financing for its expenses above its revenue (and the associated vulnerability of the country to the unavailability of financing). Inflation may indicate structural problems in the economy, and public dissatisfaction which may in turn lead to political instability.

Secondly, the *corporate sector's* riskiness can be assessed by its leverage and expense ratios, its net foreign exchange exposure to equity and the number of applications for protection against creditors.

Thirdly, the *household sector's* health can be gauged through its net assets (assets minus liabilities) and net disposable income (earnings minus consumption minus debt service and principal payments). Net assets and net disposable earnings can measure households' ability to weather (unexpected) downturns.

Fourthly, the conditions in the *external sector* are reflected by real exchange rates, foreign exchange reserves, the current account, capital flows and maturity/currency mismatches. These variables can be reflective

of sudden changes in the direction of capital inflows, of loss of export competitiveness, and of the sustainability of the foreign financing of domestic debt.

Fifthly, the *financial sector* is characterised by monetary aggregates, real interest rates, risk measures for the banking sector, banks' capital and liquidity ratios, the quality of their loan book, standalone credit ratings and the concentration/systemic focus of their lending activities. All these proxies can be reflective of problems in the banking or financial sector and, if a crisis occurs, they can gauge the cost of such a crisis to the real economy.

Lastly, variables relevant to describe conditions of *financial markets* are equity indices, corporate spreads, liquidity premia and volatility. High levels of risk spreads can indicate a loss of investors' risk appetite and possibly financing problems for the rest of the economy. Liquidity disruptions may be a materialisation of the market's ability to efficiently allocate surplus funds to investment opportunities within the economy.

Reference:

Blaise Gadanecz and Kaushik Jayaram (2009), 'Measures of Financial Stability' – A Review, BIS.

normal times and during periods of stress. In the absence of benchmarks, the analysis of these measures would depend on identifying changes in trend, major disturbances and other outliers.

7.24 Since risk assessment is a continuous process and stress tests need to be conducted taking into account the macroeconomic linkages as also the second round effects and contagion risks, consequent to the announcement in the Annual Policy Statement for 2009-10, an interdisciplinary Financial Stability Unit (FSU) have been set up in Reserve Bank of India to monitor and address systemic vulnerabilities. FSU is entrusted with the responsibility of bringing out Financial Stability Report in the future.

4. Global Initiatives towards Financial Stability

7.25 The crisis has triggered a vigorous debate on how financial stability should be safeguarded. Several lessons are clear. First, the received wisdom is that prevention is better than cure and that central banks should take countercyclical policy actions to prevent build up of imbalances. Second, a consensus is emerging around the view that central bank purview should explicitly include financial stability. Third, there is a growing acknowledgement that financial stability needs to be understood and addressed both from the micro and macro perspectives. At the micro level, there is a need to ensure that individual institutions are healthy, safe and sound; in addition, there is a need to safeguard financial stability at the macro level.

International Cooperation - Recent Initiatives

7.26 Several international initiatives have been taken in the recent period for formulating proposals for strengthening the financial system. The major initiatives in this regard include the following:

- Several reports have been released recently such as the Financial Stability Forum's (now

Financial Stability Board) Report on 'Enhancing Market and Institutional Resilience', the Geneva Report on 'The Fundamental Principles of Financial Regulation', Larosiere Report on 'The High Level Group on Financial Supervision in the EU' and the Turner Review on 'Regulatory Response to the Global Banking Crisis'.

- The G-20 countries have also taken several initiatives. In the summit held in Washington in November 2008, the G-20 countries laid down an action plan and constituted four Working Groups, viz., (i) Enhancing Sound Regulation and Strengthening Transparency; (ii) Reinforcing International Co-operation and Promoting Integrity in Financial Markets; (iii) Reform of the IMF; and (iv) The World Bank and other Multilateral Development Banks (MDBs).
- The leaders of the G-20 again met in London on April 2, 2009 and laid down the 'Global Plan for Recovery and Reform'. Drawing mainly from the recommendations of the group on Enhancing Sound Regulation and Strengthening Transparency, the G-20 also made a declaration for strengthening the financial system. The declaration agreed to make far reaching reforms in the areas of expanding the membership of international bodies, international cooperation, prudential regulations, scope of regulations, compensation, tax havens and non-cooperative jurisdictions, accounting standards and credit rating agencies.
- G-20 Finance Ministers and Central Bank Governors met in London during September 4-5, 2009 to review a comprehensive set of measures to strengthen the regulation and supervision and agreed to continue to assess the progress in delivering the 'Global Plan for Recovery and Reform'.
- With a view to increasing international co-operation, the Financial Stability Forum

(FSF), rechristened as Financial Stability Board (FSB), has been expanded to include more emerging market economies including India and its mandate has been broadened. Alongside the current mandate of the FSF – to assess vulnerabilities affecting the financial system and identify and oversee action needed to address them – the FSB will advise on market developments and monitor best practices in meeting regulatory standards, among others.

- The Basel Committee on Banking Supervision (BCBS) has also been expanded and India has been invited to nominate a member to the Committee. Accordingly, Smt. Usha Thorat, Deputy Governor, Reserve Bank of India has been nominated as a member of the BCBS.
- A Group of 30 (G-30) released the report on 'Financial Reform – A Framework for Financial Stability' on January 15, 2009 to strengthen prudential regulations and supervision.

Regulatory and Supervisory Initiatives

7.27 Group of Twenty (G-20) has pioneered the regulatory and supervisory reforms. The Group has made several recommendations / plan of actions in this regard and has placed the responsibility for monitoring the implementation plan to the recommendations, with the Finance Ministries, national financial regulators and oversight authorities, central banks, International Monetary Fund (IMF), Financial Stability Board (FSB), and Basel Committee on Banking Supervision (BCBS), International Accounting Standard Board (IASB) and other similar organisations.

Group of Twenty (G-20)

7.28 Report of G-20 (Working Group 1) on 'Enhancing Sound Regulation and Strengthening Transparency' (March 2009) has made

recommendations, *inter alia*, to strengthen the international regulatory standards. Some of the major recommendations are (i) system-wide approach to financial regulation, *i.e.*, macro-prudential supervision to supplement the micro-prudential supervision, (ii) expansion of the scope of regulation and oversight to include all systemically important institutions, markets and instruments including private pools of capital (iii) enhancements of international standards for capital and liquidity buffers, (iv) addressing pro-cyclicality aspects of accounting frameworks and capital regulation (v) management of liquidity especially for large and complex cross-border banks (vi) Infrastructure for OTC derivatives especially for the credit default swaps to contain systemic risks.

7.29 G-20 (Working Group 2) on 'Reinforcing International Cooperation and Promoting Integrity in Financial Markets' (March 2009), *inter alia*, made recommendations on steps needed for strengthening the international regulatory and supervisory cooperation, cross-border crisis management and conduct of regular joint Early Warning Exercises (EWEs) by IMF and FSB. The Group has recommended establishment of supervisory colleges for all major cross-border financial institutions and called on FSB and various home supervisors of major cross-border financial institutions to review and monitor the establishment of supervisory colleges for the purpose of enhanced cross-border supervisory cooperation, improvement in the information sharing arrangements between supervisors and the need for strengthening cross-border crisis management arrangements, especially during periods of financial distress. The Group has observed that bilateral Memoranda of Understanding are an important means for information sharing between banking supervisors. Therefore, taking into account the best practices in the area of bi-lateral information exchange, the Group has advised

the Basel Committee on Banking Supervision (BCBS) to consider updating its template 'Essential Elements of a Statement of Cooperation between Banking Supervisors'.

Basel Committee on Banking Supervision and Financial Stability Board (FSB)

7.30 The BCBS has taken initiatives which are proposed to address the key lessons of the crisis to strengthen the regulation, supervision and risk management of the banking sector in order to alleviate the stresses caused by the banking sector globally. The initiatives will ensure that banks move to a higher capital standard that promotes long term stability and sustainable growth without aggravating near term stress.

Strengthening Minimum Regulatory Capital Framework

7.31 The Basel Committee, in July 2009, has proposed new standards to strengthen the existing regulatory capital framework, especially for strengthening quality of bank capital, for promoting building-up of capital buffers that can be drawn down in periods of stress and introduce a leverage ratio as a backstop to Basel II. The Committee is also taking measures to mitigate any excess cyclicality of the minimum capital requirement and to promote a more forward-looking approach to provisioning.

7.32 The Committee has issued guidelines on 'Revisions to the Basel II market risk framework' and 'Guidelines for computing capital for incremental risk in the trading book', which is expected to take effect at the end of 2010 and introduced higher capital requirements to capture the credit risk of complex trading activities. The Committee has initiated steps to strengthen the regulatory treatment for certain securitisations in Pillar 1. It has proposed to introduce higher risk weights for resecuritisation exposures (so-called CDOs of ABS) to better reflect the risk inherent in these products.

Principles for Sound Stress Testing

7.33 Stress testing is a tool that supplements other risk management approaches and measures. The financial crisis has highlighted weaknesses in stress testing practices employed prior to the start of the crisis in four broad areas: (i) use of stress testing and integration in risk governance; (ii) stress testing methodologies; (iii) scenario selection; and (iv) stress testing of specific risks and products. Basel Committee in May 2009 has suggested principles for sound stress testing practices and supervision (Box VII.3).

Enhancement in Supervisory Review Process

7.34 The Committee has issued supplemental guidance under Pillar 2 (the supervisory review process) of Basel II to address the flaws in risk management practices revealed by the crisis. It raises the standards for firm-wide governance and risk management, capturing the risk of off-balance sheet exposures and securitisation activities, managing risk concentrations and providing incentives for banks to better manage risk and returns over the long term. The guidance incorporates 'Principles for Sound Compensation Practices' issued by the Financial Stability Board in April 2009.

Market Discipline

7.35 Inadequate transparency of structured products was observed to be a hindrance to effective market discipline during the crisis. There was a lack of transparency related to risk profiles and capital adequacy of the banks holding those assets. In response, the Committee has proposed enhancements to the Pillar 3 (market discipline) to strengthen disclosure requirements for securitisations, off-balance sheet exposures and trading activities. These additional disclosure requirements will help reduce market uncertainties about the strength of banks' balance sheets related to capital market activities.

Box VII.3: Principles for Sound Stress Testing Practices and Supervision

Principles for Banks

Use of stress testing and integration in risk governance

1. Stress testing should form an integral part of the overall governance and risk management culture of the bank. Stress testing should be actionable, with the results from stress testing analyses impacting decision making at the appropriate management level, including strategic business decisions of the board and senior management. Board and senior management involvement in the stress testing programme is essential for its effective operation.
2. A bank should operate a stress testing programme that promotes risk identification and control; provides a complementary risk perspective to other risk management tools; improves capital and liquidity management; and enhances internal and external communication.
3. Stress testing programmes should take account of views from across the organisation and should cover a range of perspectives and techniques.
4. A bank should have written policies and procedures governing the stress testing programme. The operation of the programme should be appropriately documented.
5. A bank should have a suitably robust infrastructure in place, which is sufficiently flexible to accommodate different and possibly changing stress tests at an appropriate level of granularity.
6. A bank should regularly maintain and update its stress testing framework. The effectiveness of the stress testing programme, as well as the robustness of major individual components, should be assessed regularly and independently.

Stress Testing Methodology and Scenario Selection

7. Stress tests should cover a range of risks and business areas, including at the firm-wide level. A bank should be able to integrate effectively, in a meaningful fashion, across the range of its stress testing activities to deliver a complete picture of firm-wide risk.
8. Stress testing programmes should cover a range of scenarios, including forward-looking scenarios, and aim to take into account system-wide interactions and feedback effects.
9. Stress tests should feature a range of severities, including events capable of generating the most damage whether through size of loss or through loss of reputation. A stress testing programme should also determine what scenarios could challenge the viability of the bank (reverse stress tests) and thereby uncover hidden risks and interactions among risks.
10. As part of an overall stress testing programme, a bank should aim to take account of simultaneous pressures in funding and asset markets, and the impact of a reduction in market liquidity on exposure valuation.

Specific areas of focus

The following recommendations to banks focus on the specific areas of risk mitigation and risk transfer that have been highlighted by the financial crisis.

11. The effectiveness of risk mitigation techniques should be systematically challenged.
12. The stress testing programme should explicitly cover complex and bespoke products such as securitised exposures. Stress tests for securitised assets should consider the underlying assets, their exposure to systematic market factors, relevant contractual arrangements and embedded triggers, and the impact of leverage, particularly as it relates to the subordination level in the issue structure.
13. The stress testing programme should cover pipeline and warehousing risks. A bank should include such exposures in its stress tests regardless of their probability of being securitised.
14. A bank should enhance its stress testing methodologies to capture the effect of reputational risk. The bank should integrate risks arising from off-balance sheet vehicles and other related entities in its stress testing programme.
15. A bank should enhance its stress testing approaches for highly leveraged counterparties in considering its vulnerability to specific asset categories or market movements and in assessing potential wrong-way risk related to risk mitigating techniques.

Principles for Supervisors

16. Supervisors should make regular and comprehensive assessments of a bank's stress testing programme.
17. Supervisors should require management to take corrective action if material deficiencies in the stress testing programme are identified or if the results of stress tests are not adequately taken into consideration in the decision-making process.
18. Supervisors should assess and if necessary challenge the scope and severity of firm-wide scenarios. Supervisors may ask banks to perform sensitivity analysis with respect to specific portfolios or parameters, use specific scenarios or to evaluate scenarios under which their viability is threatened (reverse stress testing scenarios).
19. Under Pillar 2 (supervisory review process) of the Basel II framework, supervisors should examine a bank's stress testing results as part of a supervisory review of both the bank's internal capital assessment and its liquidity risk management. In particular, supervisors should consider the results of forward-looking stress testing for assessing the adequacy of capital and liquidity.
20. Supervisors should consider implementing stress test exercises based on common scenarios.

Reference:

Bank for International Settlement (2009), 'Principles for Sound Stress Testing Practices and Supervision', May.

Strengthening Funding Liquidity Frameworks at the Bank and System-Wide Level

7.36 In response to liquidity risk management shortcomings and other lessons learnt from the financial crisis, the Basel Committee issued 'Principles of Sound Liquidity Risk Management and Supervision' in September 2008. The issuance of the principles was a significant step towards setting a new global standard for what constitutes robust liquidity risk measurement, management and supervision. Under this standard, banks must maintain a sufficient buffer of highly liquid assets to withstand a range of stress events, including the loss of both secured and unsecured funding. The sound principles translate this global standard into a consistent set of supervisory expectations about the key elements of a robust framework for liquidity risk management at banking organisations. The Committee expects to finalise its proposed framework by year-end and to conduct a quantitative impact study and public consultation in 2010.

Strengthening Macroprudential Regulation and Supervision/Addressing Procyclicality

7.37 BCBS has proposed to introduce macroprudential overlay that will reduce the procyclical dynamics in the banking system and address the systemic risk arising from the size and inter-connectedness of global banking institutions. Efforts are made to build buffers in good times that can be drawn in bad economic and financial conditions, thereby reducing the amplification of fluctuations in the economic cycle. The buffer capital will act countercyclical. Besides, banks should be required to raise provisions in good times. The BCBS has issued principles to assist accounting standard setters in their efforts to revise IAS 39 with an aim to promote stronger provisions based on expected losses.

7.38 FSB has come out with a Report (April 2009) on 'Addressing procyclicality in the financial system'. FSB has observed that addressing procyclicality is an essential component of strengthening the macroprudential orientation of regulatory and supervisory frameworks. It has identified three areas as priorities for policy action, viz., the capital regime, bank provisioning practices and the interaction between valuation and leverage and it is monitoring the implementation of the recommendations.

Reducing Risks from OTC Derivatives

7.39 A large number of initiatives are underway at the international level to strengthen the infrastructure for OTC derivatives, an amplifier of stress in the crisis. National supervisors and international committees have undertaken steps to mitigate the risks, focusing on efforts to move OTC derivative exposures to central counterparties and exchanges. Top priorities have been given to the implementation of Central Counterparty (CCP) clearing for Credit Default Swaps (CDS). Such CCPs have already been launched in the European Union and in the United States. The Basel Committee is reviewing the treatment of counterparty credit risk under the Basel II framework.

7.40 The Committee expects that banks and supervisors begin implementing the Pillar 2 guidance immediately. The new Pillar 1 capital requirements and Pillar 3 disclosures may be implemented not later than December 31, 2010. Taken together, these measures and enhancements to the Basel II framework will help ensure that all the following material exposures are covered in the capital adequacy framework, that they are backed by appropriate capital, that risk management and control is significantly strengthened and appropriately linked to compensation and bonuses, and that there is better disclosure of the relationship of risk and capital.

Cross-border Crisis Management and Bank Resolution

7.41 The crisis has emphasised the need for supervisory attention towards cross-border contingency planning and crisis management. Accordingly, FSB has set principles for cross-border cooperation on crisis management (April 2009). Besides, the Cross-Border Bank Resolution Group (CBRG) of Basel Committee is analysing the existing bank resolution policies and legal frameworks of relevant countries in order to assess the potential impediments and possible improvements to cooperation in crisis management and the resolution of cross-border banks. The recent crisis has shown that the existing legal and regulatory frameworks / arrangements are not customised to tackle the stresses/problems in a financial group operating through multiple, separate legal entities and this may be true in case of both the cross-border and domestic financial groups. Best practices have appeared to be local in nature (ring-fencing). The Group is in the process of developing its recommendations for cross-border bank resolution regimes in order to achieve continuity in the cross-border crisis management and resolution. The International Monetary Fund (IMF) has also issued proposals to deal with bank insolvencies.

Supervisory Structure

7.42 Following the crisis talks are on to discard supervisory framework which is build around the legal character of institutions (*e.g.* banks, insurance companies) - a silo approach to regulation and supervision, and to adopt regulatory and supervisory framework which is primarily based on the roles performed by various players in the stability of the system (liquidity provision, deposit-taking, and market making).

7.43 In Europe, a European Systemic Risk Board (ESRB) has been created based on the

recommendation of *de Larosière* report (February 2009). In the United States, it has been proposed that the Federal Reserve will become the future systemic supervisor. In France, the Government has decided a reform where insurance and banking supervision will be merged under the umbrella of a “systemic” college under the auspices of the Banque de France.

Financial Regulation and Supervision: Initiatives under Progress

7.44 Beyond initiatives already taken, work is under progress on several initiatives to strengthen stability on several fronts as highlighted below:

- Developing a global liquidity standard: Recognising that illiquidity of banks can threaten its solvency as much as inadequate capital and also adversely impact the stability of the financial system, work is under way to develop an international framework for liquidity risk regulation and supervision.
- Strengthening the supervision of cross-border entities: Given the growing number of cross-border financial conglomerates and their role in transmitting risk, arrangements are being put in place for cross-border cooperation among regulators and for establishing supervisory colleges.
- Reviewing international accounting standards: There is a view that some of the current accounting standards have contributed to market volatility. The Financial Stability Board and the accounting standard bodies are consulting on revising standards, in particular those relating to financial instruments and their valuation.
- Extending the perimeter of regulation: Work is under way to develop a global framework governing the registration, regulatory

disclosure and reporting requirements to be imposed on non-banks. The principle being put forward is that if an institution looks and behaves like a bank, then it should be regulated like a bank, regardless of its legal form.

- Strengthening the oversight of credit rating agencies: The crisis has questioned the integrity, conduct and business model of credit rating agencies. Corrective initiatives under way include stronger regulation of credit rating agencies, measures to address conflicts of interest, differentiation between ratings of structured and other products, and strengthening the integrity of the rating process.
- Rationalising compensation structures: It is agreed that compensation structures in large financial institutions have given rise to perverse incentives for staff to maximise profits at the cost of long-term sustainability. A key objective of the proposed changes is to promote compensation schemes that reflect the underlying risks taken that include back loading payoffs and claw back clauses that retrospectively adjust bonuses on the basis of future position losses.

5. An Assessment of the Indian Financial System

7.45 The Indian financial sector is still dominated by bank intermediation. Though the size of the capital market has expanded significantly with financial liberalisation in the early 1990s, bank intermediation remains the dominant feature. Important components of the financial sector in India are seven categories namely; commercial banks, Urban Co-operative Banks (UCBs), rural financial institutions, Non-banking Financial Companies (NBFCs), Housing Finance Companies (HFCs), Development Financial Institutions (DFIs) and the insurance sector. Commercial banks are the dominant institutions in the Indian

financial landscape accounting for around 60 per cent of its total assets. Together with co-operative banks, the banking sector accounts for nearly 70 per cent of the total assets of Indian financial institutions.

7.46 Over the past decade, financial institutions in India have benefited from a stable macroeconomic environment, with sustained growth especially from 2003 onwards when India recorded one of the highest GDP growth rates, accompanied generally by an acceptable level of inflation except for the temporary spike in inflation in 2008. Financial sector reform, which has been gradual and calibrated, has helped financial institutions to weather various global financial turmoils during the past ten years. This resilience is also currently evident, as the Indian financial sector has so far not been severely affected by the financial turbulence in advanced economies.

7.47 The public sector banks continue to be a dominant part of the banking system. As on March 31, 2009, the PSBs accounted for 71.9 per cent of the aggregate assets and 75.3 per cent of the aggregate advances of the scheduled commercial banking system. A unique feature of the reform of the public sector banks was the process of their financial restructuring. The banks were recapitalised by the Government to meet prudential norms through recapitalisation bonds. All the public sector banks, which issued shares to private shareholders, have been listed on the exchanges and are subject to the same disclosure and market discipline standards as other listed entities. To address the problem of distressed assets, a mechanism has been developed to allow sale of these assets to Asset Reconstruction Companies which operate as independent commercial entities.

7.48 Financial institutions have transited since the mid-1990s from an environment of an administered regime to a system dominated by market determined interest and exchange rates, and migration of the central bank from

direct and quantitative to price-based instruments of monetary policy and operations. However, increased globalisation has resulted in further expansion and sophistication of the financial sector, which has posed new challenges to regulation and supervision, particularly of the banking system. In this context, the capabilities of the existing regulatory and supervisory structures also need to be assessed by benchmarking them against the best international practices.

7.49 The financial sector reforms in the country were initiated in the beginning of the 1990s. The financial sector reforms were undertaken early in the reform cycle, which have brought about a sea change in the profile of the banking sector. Notably, the reforms process was not driven by any banking crisis, nor was it the outcome of any external support package. Besides, the design of the reforms was crafted through domestic expertise, taking on board the international experiences in this respect. The reforms were carefully sequenced with respect to the instruments to be used and the objectives to be achieved. Thus, prudential norms and supervisory strengthening were introduced early in the reform cycle, followed by interest-rate deregulation and a gradual lowering of statutory pre-emptions. The more complex aspects of legal and accounting measures were ushered in subsequently when the basic tenets of the reforms were already in place.

7.50 As regards the prudential regulatory framework for the banking system, a long way has been traversed from the administered interest rate regime to deregulated interest rates, from the system of Health Codes for an eight-fold judgmental loan classification to the prudential asset classification based on objective criteria, from the concept of simple statutory minimum capital and capital-deposit ratio to the risk-sensitive capital adequacy norms – initially under Basel I framework and now under the Basel II regime. There is much

greater focus now on improving the corporate governance set up through ‘fit and proper’ criteria, on encouraging integrated risk management systems in the banks and on promoting market discipline through more transparent disclosure standards. The policy endeavour has all along been to benchmark India’s regulatory norms with the international best practices, of course, keeping in view the domestic imperatives and the country context. The consultative approach of the RBI in formulating the prudential regulations has been the hallmark of the current regulatory regime which enables taking account of a wide diversity of views on the issues at hand. The implementation of reforms has had an all round salutary impact on the financial health of the banking system, as evidenced by the significant improvements in a number of prudential parameters, like capital adequacy ratio, asset quality profitability, Return on Assets (RoA) and productivity of banks.

Commercial Banks

7.51 Several balance sheet and profitability indicators suggest that the Indian banking sector now compares well with the global benchmarks. The Indian banking system has been assessed in international perspective by comparing various financial and soundness indicators such as return on total assets, non-performing loans ratio and capital levels (Table VII.1 and Table II.7 for data for more years; and analysis in para. 2.38).

7.52 One of the most widely used indicators of profitability is RoA, which indicates the commercial soundness of the banking system. RoA of Indian scheduled commercial banks was at 1.0 per cent at end-March 2008 (1.02 per cent at end-March 2009), which is line with the international standards. The RoA in several advanced countries and some emerging market economies were less than one per cent.

Table VII.1: Benchmarking of Indian Banking Sector

(Per cent)

Country	Return on Assets	Gross NPL to Gross Advances	CRAR	Provisions to NPL	Capital to Assets
1	2	3	4	5	6
India	1.0 *	2.3 *	13.0 *	52.6 *	6.4 **
Emerging and Developing Economies					
Brazil	1.1	4.3	18.5	157.3	9.2
Mexico	1.2	3.8	15.2	143.7	9.1
Russia	0.5 *	7.6	18.5	90.8	13.6 *
China	1 *	1.8	12.0 *	134.3	5.4
United Arab Emirates	2.2 *	2.5 *	16.2	101.5 *	10.6 *
South Africa	1.0	5.1	13.5	–	7.9 *
Advanced Economies					
USA	0.2	3.8	13.5	66.5	10.1
UK	-0.5 *	1.6 *	12.9 *	54.6 ^	4.4 *
Japan	0.2	1.7 *	13.4	25.5	3.6 *
France	0.4 **	2.8 **	10.2 **	51.3 **	4.2 *
Germany	0.3 **	2.7 **	12.9 **	56.7 *	4.5 *
Italy	0.3 *	5.5	10.8 *	46.1 *	6.6 *
Canada	1.3	0.9	10.3	29.8	5.8
Korea	0.5 *	1.5	12.9	125.3	9.5

* : Data pertains to 2008. ** : Data pertains to 2007. ^ : Data pertains to 2006.

Note: Data pertains to 2009.**Source:** Global Financial Stability Report, October 2009, IMF.

7.53 Quality of assets of banks as reflected in the ratio of non-performing loans (NPLs) to total advances is an important banking soundness indicator from the financial stability perspective. A low level of NPL ratio not only reflects the prudent business strategy followed by the banking system, but is also indicative of the conducive recovery climate and the legal framework for recovery of loans. Banks with adequate credit risk management practices are expected to have lower non-performing loans. In India, several measures taken by the Government and the Reserve Bank have enabled SCBs to substantially reduce their level of NPLs from 15.7 per cent at end-March 1997 to about

11 per cent at end-March 2001. The NPL ratio has remained unchanged at 2.3 per cent between 2008 and 2009. The ratio of provisioning to NPLs reflects the ability of a bank to withstand losses in asset value. A low ratio of provisioning to NPLs makes the banking system vulnerable to shocks. The provisioning to NPL ratio of Indian banks was 52.6 per cent at the end-March 2008. It was fairly comparable with the ratio of provisioning across most advanced countries.

7.54 Bank capital acts as the ultimate buffer against losses that a bank may suffer. The minimum capital to risk-weighted asset ratio

(CRAR) has been specified at 8 per cent by the Basel Committee on Banking Supervision (BCBS) under both the Basel I and Basel II frameworks. In the Indian context, the overall capital adequacy of the SCBs at 13.2 per cent as at end-March 2009, was well above the Basel norm of 8 per cent and the stipulated norm of 9 per cent for banks in India. As at end-March 2009, the CRAR of 78 banks was over 10 per cent, while that of only one bank was between 9 and 10 per cent. The CRAR of Indian banks was comparable with most emerging markets and developed economies. The global range of CRAR in 2008 varied between 10.0 per cent and 28.7 per cent. A capital to asset ratio is another simple measure of soundness of a bank. The lower the ratio, the higher is the leverage and greater vulnerability of a bank. Globally, the ratio varied between 3.5 per cent to 22.7 per cent in 2008, while Indian banks' (Tier I) capital to assets ratio at 6.3 per cent suggested a lower degree of leverage and higher stability.

Non-Bank Financial Institutions

7.55 Although banks dominate the Indian financial spectrum, NBFCs play an important role in financial markets. With their unique strengths, the stronger NBFCs could complement banks as innovators and partners. The core strength of NBFCs lies in their strong customer relationships, good understanding of regional dynamics, service orientation and ability to reach out to customers who would otherwise be ignored by the banks, which makes such entities effective conduits of financial inclusion.

7.56 The recent global financial turmoil has highlighted the impact on systemic stability through OFIs which, in India, operate as NBFCs. In India, there are two broad categories of NBFCs, *viz.*, NBFCs-D and NBFCs-ND. The recent growth in the NBFC sector is due primarily to NBFCs-ND. The financial indicators of the NBFCs-D segment, do not

throw up any major concern and is characterised by high CRAR, low NPAs and comfortable RoA. Systemically important NBFCs-ND (NBFCs-ND-SI) are growing at a rapid pace. The sector has been witnessing a significant improvement in financial health and is characterised by low and reducing NPAs and high RoA.

7.57 The Reserve Bank, on a review of the experience with the regulatory framework for non-banking financial companies in place since April 2007, enhanced the capital adequacy requirement for NBFCs-ND-SI and put in place guidelines for liquidity management and reporting, with specified norms for disclosures in October 2008. The implementation of capital to risk weighted asset ratio (CRAR) of 12 per cent by March 31, 2009 and 15 per cent by March 31, 2010 for these NBFCs was, however, deferred by one year, respectively, in view of the difficulty in raising equity capital in a market, which was depressed in the second half of the year in line with the sharp downward correction in asset prices globally. Taking into consideration the need for adequate access to funds for meeting business and regulatory requirements, NBFCs-ND-SI were permitted to issue perpetual debt instruments. To address problems of liquidity and ALM mismatch in the current economic scenario, the Reserve Bank permitted NBFCs-ND-SI to raise short term foreign currency borrowings under the approval route as a temporary measure, subject to certain conditions and also provided liquidity support to eligible NBFCs-ND-SI through a special purpose vehicle (SPV).

7.58 The sector's recourse to short term funds for funding their asset base is, however, a cause for concern. Borrowings accounts for about two-thirds of their funding requirements. The CFSA, 2009 has stated that given the funding requirements of NBFCs and their lack of access to low-cost deposits, there is a need to develop an active corporate bond market which could act as an alternate funding source.

Board for Financial Supervision (BFS): Initiatives

7.59 The Board for Financial Supervision (BFS), constituted in November 1994, has been mandated to ensure integrated oversight over the financial institutions that are under the purview of the Reserve Bank and remains the principal guiding force behind the Reserve Bank's supervisory and regulatory initiatives.

7.60 The BFS reviews the inspection findings in respect of commercial banks/UCBs as also periodic reports on critical areas of functioning of banks such as reconciliation of accounts, fraud monitoring, overseas operations and banks under monthly monitoring. In addition, the BFS also reviews the micro and macro prudential indicators, banking outlook and interest rate sensitivity analysis. It also issues a number of directions with a view to strengthening the overall functioning of individual banks and the banking system. The BFS held eight meetings during the period July 2008 to June 2009. In these meetings, it considered, *inter alia*, the performance and the financial position of banks and financial institutions during 2008-09. It reviewed 70 inspection reports (27 of public sector banks, 16 of private sector banks, 20 of foreign banks, 4 of local area banks and 3 of financial institutions). Some of the important issues deliberated upon by the BFS during 2008-09 are highlighted below:

- In the wake of the global financial crisis, the BFS was apprised of the minimal exposure of Indian banks to tainted assets and also the safeguards available within the Indian banking system on account of the regulatory measures initiated to strengthen the risk management and liquidity management systems of banks. The BFS was informed that an in-depth examination of investment portfolio of banks was being done as part of the Annual Financial Inspection (AFI). The BFS also enhanced its focus on monitoring the mark-to-market (MTM) losses in credit derivatives and other investment portfolios of overseas operations of banks in India on a monthly basis.
- In response to concerns in some quarters regarding risks associated with foreign exchange derivatives, detailed information was called for in structured formats by the Reserve Bank from certain select banks which were operating at the top-end of the system-level exposures. Based on a dialogue process with these banks regarding, *inter alia*, the 'suitability and appropriateness' principles and risk management policies, a comprehensive report was placed before the BFS.
- During the period under reference, the BFS issued several directions for enhancing the quality of regulation and supervision of financial institutions and some of the important directions were as follows: (i) need for evaluation by the Reserve Bank, for robustness and efficacy, of the statistical scoring and loss forecasting models deployed by banks for managing retail credit portfolios; (ii) fine-tuning and making more dynamic the process for selection of branches for the AFIs, by including additional parameters for branch-selection; (iii) prohibiting subsidiaries of banks from undertaking activities which the bank itself was not permitted to undertake as per the provisions of the Banking Regulation Act, 1949; (iv) submission of confirmation report and compliance certificate with regard to adherence to the Reserve Bank's guidelines on outsourcing arrangements entered into by banks; (v) sensitising the banks that the principles for sale/purchase of NPAs, issued in October 2007, were laid down as a broad criteria only to be adopted while entering into compromise settlements and not meant to be rigid or restrictive (hence, banks could enter into these settlements based on the circumstances/facts of each case and their

commercial judgement and should be able to justify the decision taken); and (vi) recording of intent of holding the investments, for a temporary period or otherwise, at the time of investment in a subsidiary, associate and joint venture, for the purpose of consolidation.

- The BFS also accorded its approval to certain important proposals aimed at enhancing the regulatory provisions/intent and supervisory focus. Some of them were as follows: (i) prescribing the extent of admissible liability towards Tier I and Tier II instruments in the scheme of merger/amalgamation of banks as and when such cases arose; (ii) a one-time measure designed to help banks to clear their large number of small value outstanding nostro entries originated up to March 31, 2002 while concurrently directing the banks to concentrate on follow-up effort on the high value entries that were still outstanding and to leverage technology to avoid building up of unreconciled balances.

Committee on Financial Sector Assessment, 2009

7.61 The work on a comprehensive self-assessment of India's financial sector, particularly focussing on stability assessment, stress testing and compliance with all financial standards and codes started in September 2006 by the Committee on Financial Sector Assessment (CFSA). In March 2009, the Government and the Reserve Bank jointly released the Report of the CFSA. The CFSA followed a forward-looking and holistic approach to self-assessment, based on three mutually reinforcing pillars – financial stability assessment and stress testing; legal, infrastructural and market development issues and an assessment of the status of implementation of international financial standards and codes.

7.62 On the whole, the CFSA found that the Indian financial system was essentially sound and resilient and that systemic stability was by and large robust. India was broadly compliant with most of the standards and codes, though gaps were noted in the timely implementation of bankruptcy proceedings. The CFSA also carried out single-factor stress tests for credit and market risks, liquidity ratio and scenario analyses. These tests showed that there were no significant vulnerabilities in the banking system. Though NPAs could rise during the current economic slowdown, given the strength of the banks' balance sheets, the rise was not likely to pose any systemic risk.

7.63 The assessment made by the CFSA, 2009 in respect of banking sector in India is as follows:

- (i) Commercial banks have shown a healthy growth rate and an improvement in performance as is evident from capital adequacy, asset quality, earnings and efficiency indicators. In spite of some reversals during the financial year 2008-09 (up to September 2008), the key financial indicators of the banking system do not throw up any major concern or vulnerability and the system remains resilient.
- (ii) The Herfindahl-Hirschman Index for India (which was at 536 in 2008) indicates that the Indian banking sector is 'loosely concentrated'. A cross country comparison of the concentration index shows that India's position is comparable with those of the advanced economies, but shows a lower concentration than other emerging market economies.
- (iii) The implementation of reforms has had an all round salutary impact on the financial health of the banking system, as evidenced by the significant improvements in a number of prudential parameters, like capital adequacy ratio, asset quality profitability, return on assets (RoA) and

productivity of banks. Further, the Z-score (a higher Z-score implies a lower probability of insolvency risk and in this model, risk is summarised as the number of standard deviations an institution's earnings must drop below its expected value before equity capital is depleted) of commercial banks increased from 10.2 for period 1997-2006 to 13.2 for period 1999-2008 – an indication of increasing solvency. The level of capital ratio in the Indian banking system compares quite well with the banking system in many other countries – though the capital adequacy of some of the banks in the developed countries has remained under considerable strain in the recent past in the aftermath of the sub-prime crisis.

- (iv) One area of concern has been that off-balance sheet (OBS) exposure has increased significantly in recent years, particularly in the case of foreign banks and new private sector banks. The notional principal amount of OBS exposure increased from Rs.8,42,000 crore at end-March 2002 to Rs.1,49,69,000 crore at end-March 2008⁴. The ratio of OBS exposure to total assets increased from 57 per cent at end-March 2002 to 204 per cent at end-March 2009. The spurt in OBS exposure is mainly on account of derivatives whose share averaged around 80 per cent. The derivatives portfolio has also undergone change with single currency IRS comprising 57 per cent of total portfolio at end-March 2008 from less than 15 per cent at end-March 2002. The exposure in the case of PSBs has shown an increase subsequent to the amendment in the SC(R) Act in 2003 allowing Over-The-Counter (OTC) transactions in interest rate derivatives. The stress testing carried out by CFSA is provided in Box VII.4.

7.64 Way forward, there is a need to undertake multi-factor stress testing as a tool for supplementing other risk management approaches. In addition, the sound principles of stress testing as recommended by BIS would need to be implemented (Box VII.3).

7.65 Among two areas of concern first is that there has been an increase in the dependence on bulk deposits to fund credit growth. This could have liquidity and profitability implications. An increase in growth in housing loans, real estate exposure as also infrastructure has resulted in elongation of the maturity profile of bank assets. Secondly, mark to market (MTM) losses for the banking system arising out of falling asset prices in the international markets exerted severe stress on the balance sheets of many international banks, on account of their significant exposure to such assets. Large off-balance sheet exposures magnified their stress levels further. In this context, it was felt necessary by the Reserve Bank to keep track of the quality of exposures of overseas operations of Indian banks for timely action and supervisory intervention, if required. Consequently, the Reserve Bank held discussions with select major banks with overseas operations to assess the quality of their overseas exposures. The assessment revealed that the banks did not have any direct exposure to the US sub-prime market. Some banks, however, had indirect exposure through their overseas branches and subsidiaries to the US sub-prime markets in the form of structured products, such as collateralised debt obligations (CDOs) and other investments. Some of the banks, with exposures to credit derivatives, had to book MTM losses on account of widening of credit default swap (CDS) spreads. The assessment, however, showed that such exposures were not very significant, and banks had made adequate provisions to meet the MTM

⁴ As per latest data, the OBS exposure of SCBs declined to Rs.1,06,71,961 crore at end-March 2009 from Rs. 1,44,98,587 crore on end-March 2008, partly reflecting implementation of appropriate prudential regulations by the Reserve Bank.

Box VII.4: Stress Testing by CFSA, 2009

As is well-known, the resilience of the financial system can be tested by subjecting the system to stress scenarios. Such tests are generally carried out with reference to a sudden shock and its instantaneous impact; in practice, when such shocks take place, banks get time to adapt and mitigate the impact. The CFSA, 2009 carried out single-factor stress tests for the commercial banking sector covering credit risk, market/interest rate risk and liquidity risk. They have revealed that the banking system can withstand significant shocks arising from large potential changes in credit quality, interest rate and liquidity conditions. These stress tests for credit, market and liquidity risk show that Indian banks are generally resilient.

- Credit risk: Stress testing for credit risk was carried out by increasing both the NPA levels and provisioning requirements for standard, substandard and doubtful assets. The analysis was carried out both at the aggregate level and individual bank level for end-March 2008 under three scenarios. Given the recent global financial developments and their likely impact on the Indian economy, the stress tests were further conducted for the end of September 2008. It may be noted that even under the worst case scenario, CRAR remained comfortably above the regulatory minimum (Table 1). Although credit risk was assessed as low, continuous monitoring is required to avoid any unforeseen and significant asset quality deterioration over the medium term.
- To test the banking system's resilience to market risk, interest rate risk stress tests were undertaken using both earnings at risk (EaR), as also the economic value perspective. In the EaR perspective, the focus of analysis is the impact of changes in interest rates on accrual or reported earnings. Applying the EaR approach, it was observed in March 2008 that for an increase in interest rates the net interest income (NII) increases for 45 banks, comprising 64 per cent of the banking assets. This is because, typically, the banks' balance sheets are asset sensitive, and an increase in interest rate raises the interest income relative to interest expenses.
- The banks have been actively managing their interest rate risk by reducing the duration of their portfolios. The duration of equity reduced from 14 years in March 2006 to around 8 years in March 2008 – a pointer to better interest rate risk management. Taking the impact based on the yield volatility estimated at 244 basis points (bps) for a one-year holding period showed, *ceteris paribus*, erosion of 19.5 per cent of capital and reserves. The CRAR would reduce

from 13.0 per cent to 10.9 per cent for a 244 bps shock. The CRAR of 29 banks that account for 36 per cent of total assets would fall below the regulatory CRAR of 9 per cent. These results remained broadly robust for different plausible stress scenarios and assumptions. Carrying out similar tests using the September data also had not shown any added vulnerability to the banking system.

- Liquidity Risk: The importance of managing liquidity risk came to the fore during the recent turmoil, when inter-bank money markets became illiquid. Liquidity risk originates from the potential inability of a bank to generate liquidity to cope with demands entailing a decline in liabilities or an increase in assets. The management of liquidity risk is critical for banks to sustain depositors' confidence.
- Typically, banks can meet their liquidity needs by two methods: stored liquidity and purchased liquidity. Stored liquidity uses on-balance sheet liquid assets and a well-crafted deposit structure to provide all funding needs. Purchased liquidity uses non-core liabilities and borrowings to meet funding needs. While dependence on stored liquidity is considered to be safer from the liquidity risk perspective, it has cost implications. A balanced approach to liquidity strategy in terms of dependence on stored and purchased liquidity is the most cost-effective and optimal risk strategy.
- To assess the banking sector's funding strategy and the consequent liquidity risk, a set of liquidity ratios were developed and analysed in detail. The analysis of this set of liquidity ratios revealed that there is growing dependence on purchased liquidity and also an increase in the illiquid component in banks' balance sheets with greater reliance on volatile liabilities, like bulk deposits to fund asset growth. Simultaneously, there has been a shortening of residual maturities, leading to a higher asset-liability mismatch.
- The CSFA Report emphasised the need to strengthen liquidity management in this context as also to shore up the core deposit base and to keep an adequate cushion of liquid assets to meet unforeseen contingencies. It may also be worth considering a specific regulatory capital charge if the bank's dependence on purchased liquidity exceeded a defined threshold. There is also a need for the banks and the Reserve Bank to carry out periodic stress and scenario testing to assess the resilience to liquidity shocks in the case of some big banks, which have systemic linkages. This could then be extended to other banks.

Table 1: Stress Tests of Credit Risk - Scenarios and Results with Reference to September 30, 2008

	Without stress	Scenario I - Increase in NPAs								Scenario II	Scenario III		
		25 per cent		50 per cent		100 per cent		150 per cent					
1	2	3	4	5	6	6	7	8	9	10	11	12	13
All Banks	12.5	11.8	4	11.6	4	11.1	8	10.6	12	11.2	12	12.0	2
Nationalised	12.0	11.2	2	11.0	2	10.5	4	9.9	6	10.2	5	11.5	1
SBI Group	12.1	11.1	0	10.8	0	10.3	0	9.7	2	10.6	2	11.4	0
New Private	139	13.5	0	13.3	0	12.8	1	12.4	1	13.4	1	13.7	0
Old Private	14.1	13.3	1	13.0	1	12.4	2	11.8	2	12.4	2	13.6	1
Foreign	12.2	12.0	1	11.9	1	11.8	1	11.6	1	11.5	2	12.1	0

* : Number of banks whose CRAR would fall below 9 per cent due to the stock.

Source: CFSA, 2009.

losses on such exposures. Besides, the banks also maintained high levels of capital adequacy ratio. The Reserve Bank's assessment suggested that, the risks to the banking sector associated with MTM losses, appeared to be limited and manageable. Accordingly, a monthly reporting system was introduced in September 2007 capturing Indian banks' overseas exposure to credit derivatives and investments such as Asset Backed Commercial Papers (ABCP) and Mortgage Backed Securities (MBS). An analysis of the information so collected reveals that the exposures of Indian banks through their overseas branches in credit derivatives and other investments are gradually coming down from the June 2008 level. Their MTM losses, however, gradually increased up to March 2009, reflecting the impact of the sustained fall in the value of the assets in their portfolios.

7.66 Apart from the above direct impact of the global financial crisis through MTM losses which was assessed to be insignificant for Indian banks, another area of focus was the possible asset quality concerns arising from weakening growth prospects as certain sectors in the economy clearly came under the influence of falling external demand due to the global recession and subsequent deceleration in domestic private demand. The asset quality of banks' exposures to the sectors perceived to be under stress became a matter of supervisory concern. A credit risk stress test of banks' exposure to seven such sectors (chemicals/dyes/paints, leather and leather products, gems and jewellery, construction, automobiles, iron and steel and textiles), accounting for 15.4 per cent of gross advances and 12.2 per cent of gross NPAs, was carried out to assess the impact on banks' capital adequacy due to an assumed rise in NPAs. The stress tests were run under two scenarios, *viz.*, 300 per cent and 400 per cent increases in NPAs in the seven sectors simultaneously. The additional provisioning requirements, assuming

the rise in NPAs were adjusted from existing regulatory capital and risk-weighted assets, were estimated to arrive at the adjusted capital adequacy. The results of the stress tests revealed the inherent strength of the banks to withstand sizeable deterioration in asset quality in the identified sectors. The capital adequacy ratio of only two banks accounting for around 3 per cent of total assets of the banking system was assessed to drop below the prescribed minimum level under both the stress scenarios.

7.67 The assessment of MTM losses and stress test results, thus, further validated the resilience of the Indian banking system to the shocks and concerns emanating from the global economic crisis.

7.68 To sum up, the resilience of the Indian financial sector in the face of the unprecedented global financial crisis to a large extent reflected the soundness of the Reserve Bank's regulatory and supervisory policies and the country's approach to financial reforms to support economic growth and development. The Reserve Bank's regulatory and supervisory initiatives during 2008-09 included changes in prudential regulations and measures to improve customer services, promote financial inclusion and strengthen anti-money laundering in the banking sector. Prudential regulations, which were earlier stepped up during the economic boom phase through counter-cyclical use of risk weights and provisioning on standard assets were brought down to the normal levels to create enabling conditions for preventing sharp moderation in credit growth during the economic slowdown. Initiatives were also taken for meeting country-specific requirements in convergence with international best practices; strengthening the supervisory framework in terms of cross-border supervision; risk-based supervision and bank-led conglomerates; and strengthening the off-site monitoring system further for surveillance over bank's credit portfolios.

6. Domestic Financial Markets

7.69 As much as deep and efficient financial markets are essential for realising the growth potential of an economy, disorderly financial markets could be a source of risk to both financial institutions and the real economy. The contagion from the global crisis operating through the trade, capital flows and confidence channels created pressures and enhanced volatility in the financial markets of India, in particular the foreign exchange market, the capital market and the money market. The main impact of the unfolding global financial crisis on the Indian financial markets was in the form of reduction in net capital inflows and significant correction in the domestic stock markets on the back of sell-off in the equity market by the foreign institutional investors (FIIs).

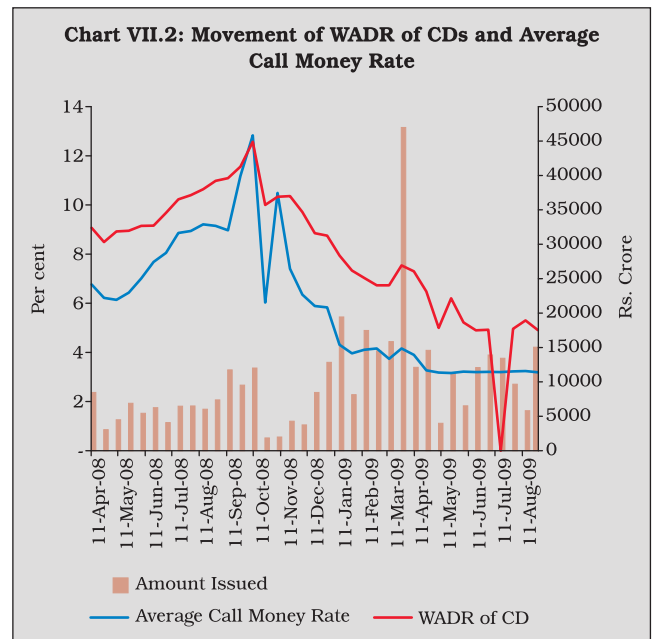
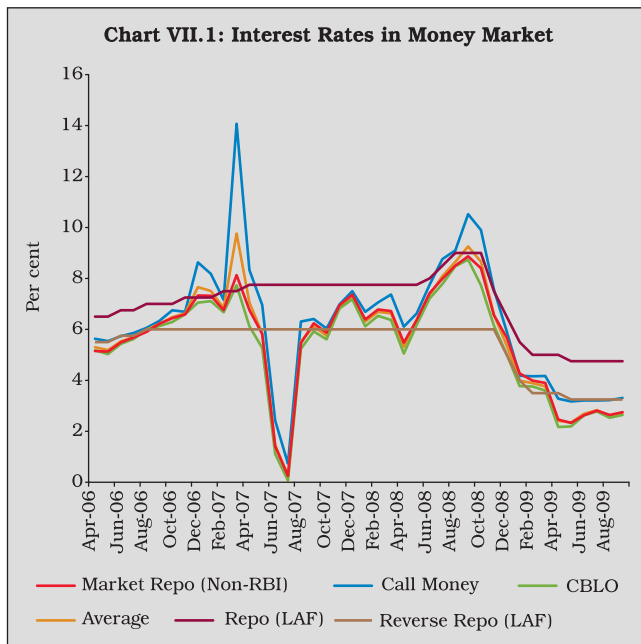
7.70 The Reserve Bank responded to the effects of the contagion in several ways. The additional liquidity that was made available amounted to Rs.5,61,700 crore since mid-September 2008 (also see Chapter III). Reflecting the impact of the measures taken by the Reserve Bank, the call rate in the money market settled back into the informal LAF corridor starting November 2008, having breached the upper bound on many days in the preceding two months. In the foreign exchange market, the Indian rupee generally depreciated against major currencies up to the end of the financial year, before appreciating in the first quarter of 2009-10. In the credit market, the lending rates of scheduled commercial banks (SCBs) began to soften at a gradual pace from November 2008. The 10-year benchmark Government securities yield also softened from the October 2008 levels by the end of the year, reflecting the easing liquidity conditions. The Government securities market was, however, bearish for most of the fourth quarter of 2008-09. Yields, particularly in the medium to long-term maturity, strengthened on account of the worsening of market sentiment following the upsurge in Government's market borrowing 2008-09 as well as the large market

borrowing requirement of the Government for 2009-10. Indian equity markets, picking up global cues, staged some recovery in the last week of March 2009, which continued in Q1 of 2009-10 and thereafter.

Money Market

7.71 Reflecting the tight liquidity conditions, the call money rate moved above the repo rate during the second half of September 2008. The pressure on money markets continued to prevail in the beginning of the third quarter of 2008-09, partly on account of the foreign exchange operations of the Reserve Bank undertaken to contain excess volatility. Consequently, the call rate continued to remain above the informal corridor in the first half of October 2008 and reached an intra-year peak of 19.7 per cent on October 10, 2008. Reflective of the impact of the measures taken by the Reserve Bank, the call rate in the money market which had breached the upper bound in September-October 2008 settled back into the informal LAF corridor starting November 2008. The call money rate declined further from the beginning of the first quarter of 2009-10 mainly due to significant easing of liquidity conditions on account of Government expenditure, MSS unwinding and open market operations as well as reduction in the LAF policy rates by 25 basis points. The average daily call rate was at 3.22 per cent in the first quarter of 2009-10 as compared with 4.17 per cent during the last quarter of 2008-09. The call rate continued to hover around the lower bound of the LAF corridor in the current financial year so far (Chart VII.1).

7.72 At present, the collateralised market is the predominant segment of the money market, accounting for more than 75 per cent of the total volume during 2008-09. Interest rates in the collateralised segments of the money market - the market repo (outside the LAF) and the CBLO - moved in tandem with, but remained below the call rate. In both the CBLO and market repo segments, mutual funds remained the major



lenders, while commercial banks and primary dealers were the major borrowers.

7.73 The CDs issuances slowed down after mid-October 2008 following the knock-on effect of the global financial crisis on the Indian financial sector, but picked up again from mid-December 2008 following the easing of liquidity conditions. The Weighted Average Discount Rate (WADR) of CDs has generally moved in tandem with the call money rate. In 2008-09, the WADR increased continuously and reached the peak of 12.6 per cent on October 10, 2008 in the midst of turmoil in the international financial markets. It declined subsequently with the improvement in liquidity conditions following the initiation of various monetary measures by the Reserve Bank, and was placed at 7.53 per cent at end-March 2009.

7.74 The average fortnightly issuance of CDs during the current fiscal year so far was placed at around Rs.10,800 crore as compared with Rs.5,900 crore in the corresponding period of the previous year. The WADR has declined during the current financial year so far, and was placed at 4.9 per cent at end-August 2009 as compared with 10.98 per cent in the corresponding period of the previous year (Chart VII.2).

7.75 After September 2008, the incremental issuance of CP slowed down till mid-December 2008 mainly reflecting the redemption pressure faced by MFs during the financial turmoil. The issuance of CP picked up during second half of December 2008 and January 2009, as liquidity conditions eased. The WADR of CPs had increased steadily up to 14.17 per cent on October 31, 2008, and subsequently moved downwards to 9.78 per cent in mid-March 2009, with the easing of liquidity conditions. The average fortnightly issuance of CPs during 2009-10 so far is placed at Rs.7,500 crore as compared with Rs.5,400 crore in the corresponding period of the previous year. The WADR has also declined in the current financial year so far to 5.0 per cent as at end-August 2009 as compared with 11.5 per cent in the corresponding period of the previous year.

Volatility in the Uncollateralized Inter-bank Money Market

7.76 As evident from the previous paragraphs, the knock-on effects of the global financial crisis adversely and abruptly impacted the volumes and rates in the domestic money market. The impact was, however, short-lived not only

because Indian banks and financial institutions did not have any direct exposure to the failing financial institutions and troubled assets but also because swift policy initiatives by the Indian authorities, through both conventional and unconventional routes, were effective in restraining undue volatility in the rates and quickly restoring normalcy in the domestic money market. The Indian experience assumes significance as sudden upsurges in the volatility of financial market prices (as opposed to a sustained high level of volatility) are generally perceived to jeopardize financial system stability *i.e.* result in severe market/institutional disruptions that can potentially reduce real activity, as was evident in many advanced economies.

7.77 Against this backdrop, the trend in the volatility of the uncollateralized inter-bank money market rate in India is juxtaposed against those in select advanced and emerging market countries *viz.*: United States of America (USD), Euro zone (Euro), England (GBP), Japan (JPY), Russia (RUB), and South Korea (KWN). The period under consideration is April 1, 2007 to March 31, 2009 which would help in gauging the trends in the volatility prior to the outbreak of the recent global financial crisis, as well as the changes in the volatility during and some months after the crisis. A similar analysis would be undertaken in respect of the volatilities in (a) the spot currency rates in the foreign exchange market and (b) the yields in Government securities market in the subsequent sections of this Chapter. Volatility in this analysis refers to the annualised standard deviation of daily returns. The standard deviation of daily returns is, in turn, calculated from a moving window of a 30-data holding period *viz.*, the closing levels of each of the previous 30 calendar days. While the absolute change in daily returns is taken into consideration to calculate the volatility of interest rates (*i.e.* uncollateralised inter-bank money market and yields in the Government

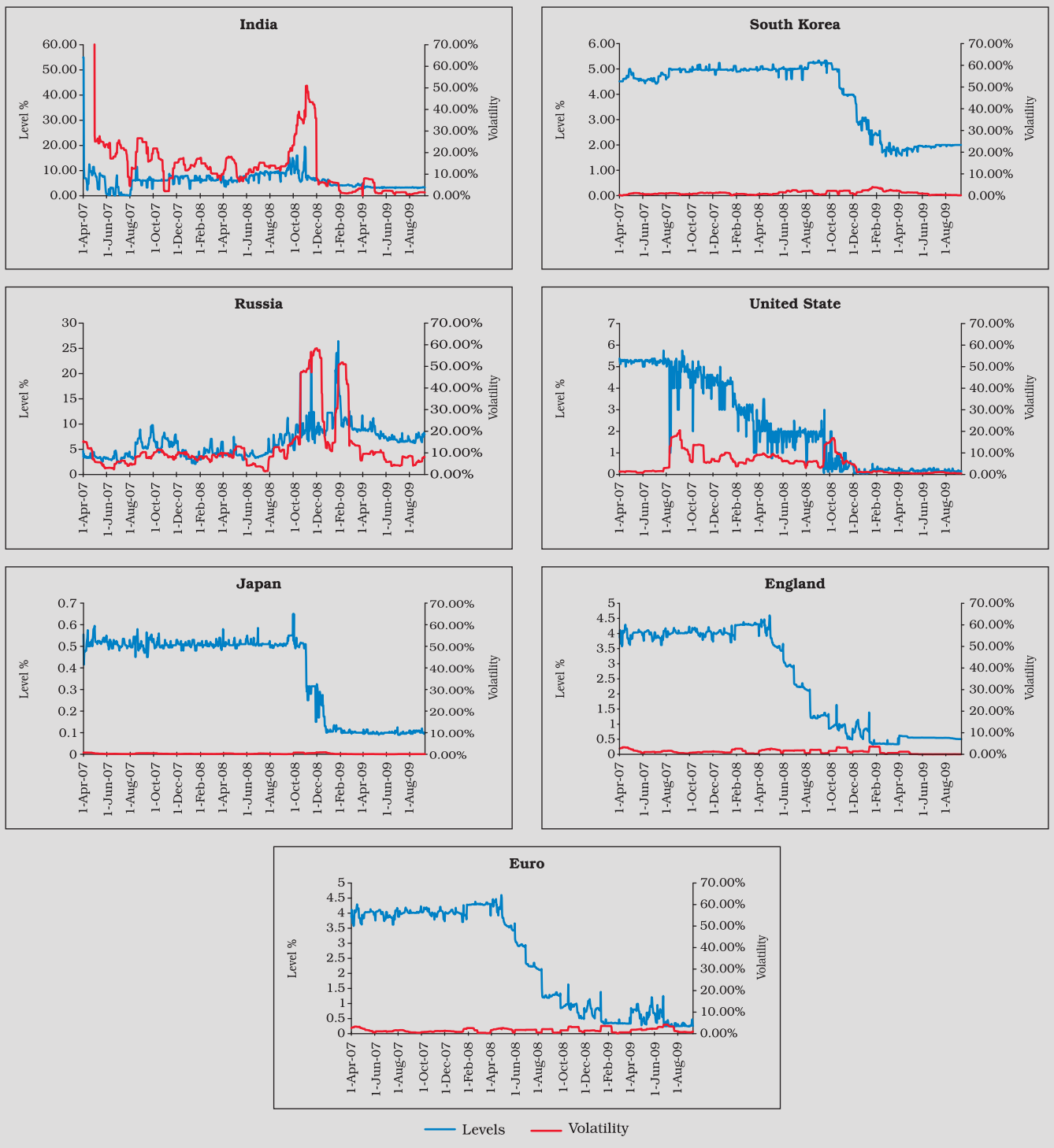
securities market), *lognormal* daily returns are used to obtain the volatility of exchange rates, in line with standard practices. The interest rates and exchange rates used in the analysis reflect the impact of policy interventions.

7.78 It is evident from Chart VII.3 that the volatility in the inter-bank uncollateralised money market in India has generally remained higher than that in other countries, both before as well as after the outbreak of the recent global financial crisis. Nevertheless, the spurt in volatility in the Indian inter-bank uncollateralised rate was only for a brief period (in September-October 2008) and it declined within a short time span to levels even below those in the pre-crisis phase, reflecting the impact of debt liquidity management and other policy actions. A spike in volatility in interbank rates is also noticeable in the US; in fact, a regime-shift in volatility is evident following the sharp cuts in the Fed Funds Target Rate. The volatility in the inter-bank uncollateralised money market in the UK and South Korea also increased in the context of the global financial crisis, but to levels much lower than those in India and the US. On the other hand, Japan and Russia showed only a marginal and short-lived increase in volatility.

Interest Rate Futures

7.79 With a view to developing a robust interest rate futures (IRF) market, the Technical Advisory Committee on Money, Foreign Exchange and Government Securities Market (TAC) of the Reserve Bank had, in August 2007, constituted a Working Group on Interest Rate Futures (Chairman: Shri V.K. Sharma) following an announcement in the Annual Policy for the year 2007-08. The TAC report on Interest Rate Futures was released in August 2008. The Working Group had recommended, *inter alia*, the introduction of a physically settled contract based on a 10-year notional coupon bearing government bond along with regulatory changes such as extension of the tenor of short selling so as to be co-terminous with the IRF contracts,

Chart VII.3: Trend and Volatility of Overnight interbank market



synchronous review of the dispensation to hold entire SLR securities in the HTM portfolio, allowing banks to take trading positions, symmetrical accounting standards for IRFs and

underlying GoI securities as well as interest rate swaps, etc. The RBI-SEBI Standing Technical Committee was entrusted with the work relating to the operationalisation of the recommendations

of the TAC Report. The Committee submitted its report in May 2009, which recommended introduction of a physically settled IRF contract on a notional coupon bearing 10-year government bond and dealt with issues relating to product specification and risk management measures at the exchange level. Meanwhile, in October, 2008, RBI had allowed the banks to take trading position in IRF. IRF contract on a 7 per cent (notional) coupon bearing 10-year government bond, initially for December 2009 and March 2010 delivery was launched on August 31, 2009 in the currency futures segment of the National Stock Exchange. The contract, upon maturity, shall be settled by physical delivery of one of the deliverable government bonds at the option of the seller of the contract. As on October 9, 2009, the total open interest was Rs 109.80 crore. On that day, the implied repo rate of the cheapest to deliver (CTD) security (7.94% GS 2021) was 1.54 per cent and for the 10-year benchmark security (6.90% GS 2019) was (-) 14.39 per cent. The corresponding figures for arbitrage free yield for these two securities were 8.01 per cent and 7.48 per cent, respectively.

Interest Rate Swaps

7.80 While the swap market, especially the overnight index swaps (OIS) market, has been very active in India and used by banks as well as other entities to manage their interest rate risk more than any other instrument, the absence of a term money market and therefore 3-or 6 months benchmark rates has led to entire market concentration on the overnight benchmark. The notional principal outstanding for commercial banks in respect of Interest rate swaps had increased from Rs. 10,81,867 crore as on March 31, 2005 to Rs. 80,18,647 crore as on March 31, 2008.

7.81 Inadequate transparency in this over-the-counter market had prompted the Reserve Bank to introduce a reporting mechanism from

August 2007 to capture the inter-bank trades. With a view to further strengthening the reporting mechanism, the Reserve Bank has advised all SCBs and PDs to report client level transactions as well at weekly intervals effective from week ending October 16, 2009.

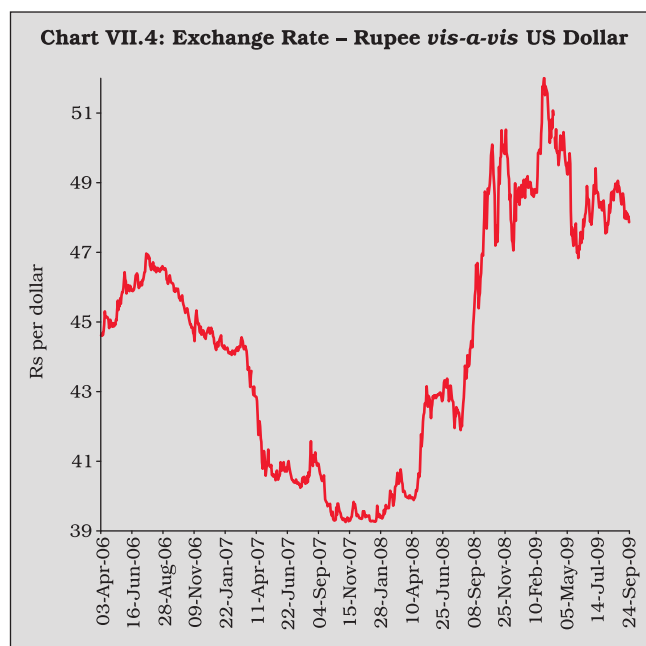
Foreign Exchange Market

7.82 For dealing with the excess demand conditions in the foreign exchange market, a number of measures were initiated to ease the supply situation by partly assuring greater access to the Reserve Bank's foreign reserves and partly by improving the inflows in response to specific measures. Besides the actual intervention sales in the foreign exchange market, the Reserve Bank also opened the forex swap facility for the banks. To ease the demand pressure from oil importing companies during the high and rising phase of international prices, the Reserve Bank had operated special market operations in the secondary market through commercial banks involving direct supply of forex liquidity against the oil bonds of the public sector oil marketing companies. The policy measures that aimed at improving the supply of forex liquidity included permitting banks to borrow from their overseas branches within prudential limits, relaxing further the ECB policy, including allowing NBFCs and housing finance companies to borrow in foreign currency, and raising the interest rates on NRI deposits. Notwithstanding the demand pressure in the forex market, in view of depressed international asset prices, the corporates were permitted to prematurely buy back their FCCBs at prevailing discounted rates (Also see Chapter III).

7.83 The Indian rupee exhibited greater two-way movements during 2008-09, moving between Rs. 39.9 and Rs. 52.1 per US dollar. The rupee generally depreciated during the first half of 2008-09, reflecting FIIs outflows, bearish stock market conditions, high inflation and

higher crude oil prices indicating higher demand for dollars. With the intensifying external shocks, it depreciated sharply thereafter breaching the level of Rs.50 per dollar on October 27, 2008. The rupee closed the year at 50.9 per US dollar.

7.84 The rupee generally appreciated against the US dollar during 2009-10 so far on the back of significant turnaround in FII inflows, continued inflows under FDI and NRI deposits, better than expected macroeconomic performance in Q4 of 2008-09 and weakening of the US dollar in the international markets. Additionally, the outcome of the general elections, which generated expectations of political stability, buoyed the market sentiment and contributed towards the strengthening of the rupee, especially in the second half of May 2009. As a result, during 2009-10 so far (up to October 1, 2009), the rupee appreciated by 6.4 per cent against the US dollar (Chart VII.4).



Volatility in Foreign Exchange Market

7.85 Similar to the analysis on volatility in the uncollateralised inter-bank money market rates, the volatility in the spot exchange rates of different currencies vis-à-vis USD has been worked out and juxtaposed along with the level of the exchange rates (Chart VII.5). It is evident that the flight to safety into US dollar and Japanese yen, triggered by the financial crisis led to the strengthening of these two currencies. This period also witnessed an increase in volatilities. It is significant to note that in despite weakening trend of the Indian Rupee against US dollar, the volatility in the USD/INR exchange rate was relatively lower than that in other currency pairs.

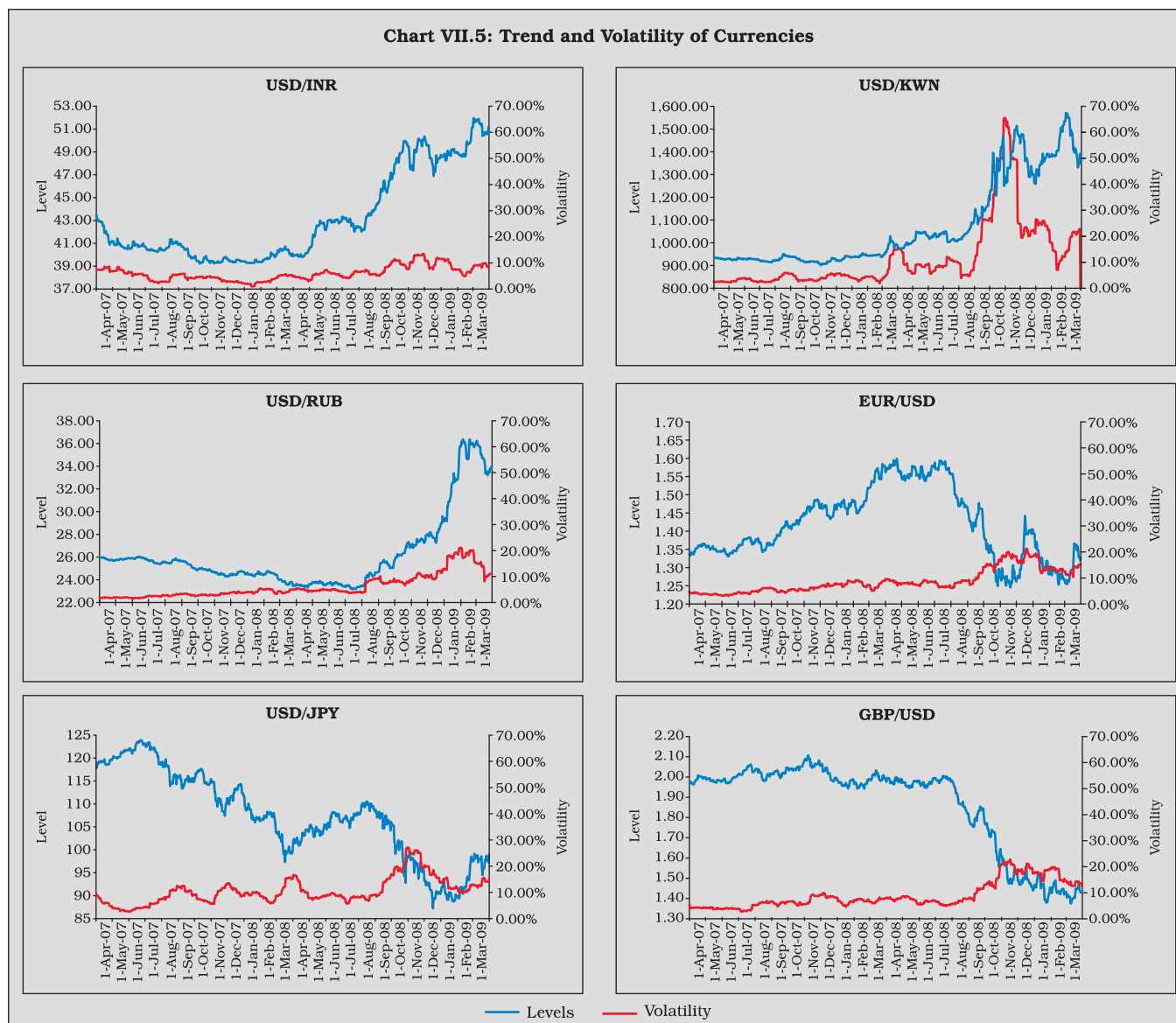
Government Securities Market

7.86 The movement in the 10-year Government security yield since April 2008 can be categorised into three broad phases. During the first phase, i.e., April to around mid-July 2008, the 10-year yield hardened on heightened inflationary expectations emanating from the sharp increase in global commodity prices and concomitant increases in domestic policy rates⁵, and reached a high of 9.51 per cent on July 15, 2009. During the second phase (mid-July to end-December 2008), the 10-year yield generally eased following the reduction in inflationary pressures tracking softening crude oil prices, easing of domestic liquidity conditions and decline in domestic policy rates in response to the indirect impact of the global financial turmoil (from mid-September 2008) and monetary policy easing in the US⁶. The 10-year yield stood at 5.31 per cent as at end-December 2008 as compared with 8.63 per cent as at end-

⁵ The cash reserve ratio was increased by 25 bps on August 30, 2008 to 7.25 per cent and LAF repo rate was increased by 50 bps to 7.5 per cent on July 29, 2008.

⁶ The cash reserve ratio was decreased by 150 bps on October 11, 2008 to 5.5 per cent. The US Fed funds target rate, was reduced to 1.50% by 50 bps on October 8, 2008 and 50 bps on October 29, 2008 and further by 75 bps to a range between 0 to 0.25% on December 16, 2008.

Chart VII.5: Trend and Volatility of Currencies



September 2008 and 7.93 per cent as at end-March 2008. During the third phase (January to July 2009), the 10-year yield generally hardened (barring some brief interludes in February and April), notwithstanding the continued prevalence of easy liquidity conditions and further reduction in the domestic policy rates⁷ in January 2009 and March 2009. This was largely on account of the

worsening of market sentiment following the upsurge in the Government's market borrowing programme for 2008-09 as well as the large market borrowing requirement of the Government for 2009-10. The initiation of a series of auction-based purchases of Government dated securities by the Reserve Bank in February 2009 in addition to its purchases through the NDS-OM, however,

⁷ The Cash reserve ratio was decreased by 50 bps on January 17, 2009 to 5 per cent. The LAF repo rate and reverse repo were reduced by 100 bps each to 6.5 percent and 4 per cent respectively on January 2, 2009.

helped to restrain the increase in the G-Sec yields. The 10-year yield was placed at 7.15 per cent as on end-July 2009 as compared with that of 7.01 as on end-March 2009 (Table VII.2).

Volatility in Government Securities Markets

7.87 The 10-year local currency generic Government bond rate has been used to calculate the volatility in the Government securities market (Chart VII.6). In the case of the Euro zone, the 10-year generic yield is based on the yields of the underlying country-specific security predominantly being Germany and France. It is evident that Government yields declined sharply some time after the outbreak of the global financial crisis, exhibiting the impact of the measures to enhance systemic liquidity, but then increased somewhat, reflecting the increase supply of securities induced by the imperative of financing fiscal stimulus measures.

The volatility in the Government securities market increased sharply in all countries, except in the case of Japan. Furthermore, the volatility in the Government securities market in India was higher than that of other countries except Russia.

Credit Market

7.88 As indicated in Chapter IV, bank deposit and lending rates, which hardened up to October 2008, started easing somewhat from November 2008, reflecting measures taken by the Reserve Bank with a view to containing the spillovers of the global financial crisis on the domestic credit markets. Interest rates offered by PSBs on deposits of all maturities eased moderately between March 2008 and March 2009, while those of private sector banks on deposits of one year to three years firmed up. The actual lending rates, other than export credit on demand and term loans for the SCBs,

Table VII.2: Structure of Interest Rates*

Instrument	As at End of			
	March 2007	March 2008	March 2009	July 2009
1	2	3	4	5
I. Debt market				
1. Government Securities Market				
5 -Year	7.97	7.70	6.75	6.72
10 -Year	7.97	7.93	7.01	7.15
II. Money Markets				
2. Call Borrowing (Average)	14.07	7.37	4.17	3.21
3. Commercial papers				
WADR 61 - 90 days	11.65	10.79	9.87	3.67 @
WADR 91-180 days	11.81	10.01	9.47	4.06 @
Range	10.25-13.00	9.50-14.25	6.40-12.50	3.04-8.85 @
4. Certificates of deposit				
Range	10.23-11.90	9.00-10.75	6.00-11.50	
WADR Overall	10.75	10.00	7.53	4.98 *
3 Months	11.35	10.73	7.04	4.82 *
12 Months	10.59	9.97	7.82	5.36 *
5. Treasury Bills				
91 days	7.98	7.36	4.92\$	3.23 \$
364 days	7.98	7.35	5.50\$	3.80 \$

WADR : Weighted Average Discount Rate.
 * : Data pertaining to the fortnight ended July 17, 2009
 @ : As on fortnight ended July 15, 2009.
 \$: Data pertain to last auctions of the respective months.

Chart VII.6: Trend and Volatility of 10-yr yield point on the Government Bond Yield Curve



increased between March 2008 and December 2008. This complicated the transmission mechanism in the face of falling policy rates and declining inflation. Although the policy rates have been substantially eased since early

October 2008, significant rigidity has been witnessed in banks' deposit and lending rates, which continue to be high despite some moderation in the past few months. This rigidity could be attributed to a number of factors. First,

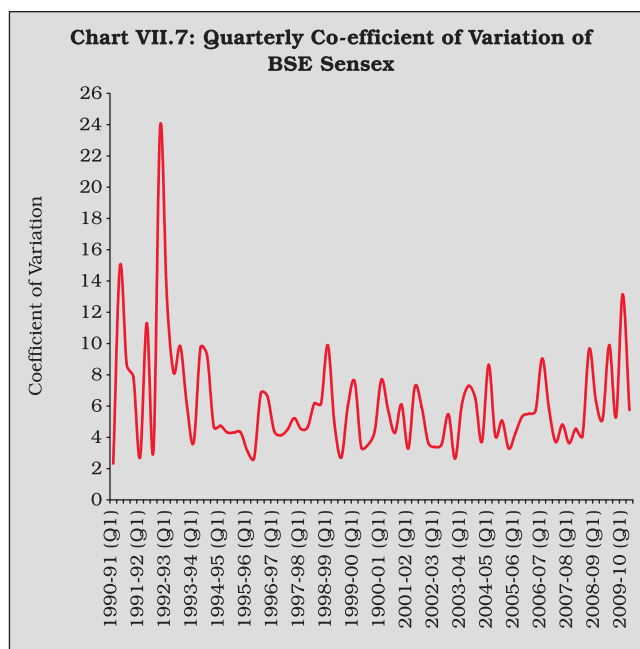
the interest rate on small savings continues to be administered and a reduction in interest rates on bank deposits could make bank deposits relatively unattractive, which could lead to some deceleration of growth in bank deposits, as was witnessed in the past. Second, while interest rates on incremental time deposits are coming down, the average cost of deposits still remains high as the bulk of banks' time deposits raised in the past continue to be at higher interest rates. This, in turn, constrains an immediate substantial reduction in lending rates. Third, with increase in risk aversion, lending rates tend to be high even during periods of falling credit demand. In 2009-10 so far, the reduction in the deposit and lending rates was somewhat more pronounced as the liquidity conditions remained easy and risks seemed to have abated and the impact of policy easing appeared to have worked through. There has been a reduction in the term deposit rates and the BPLRs across bank groups. The weighted average lending rate increased from 11.9 per cent in 2006-07 to 12.3 per cent in 2007-08, but is estimated to have declined to 11.1 per cent by March 2009. The effective lending rate is expected to have declined further in 2009-10 so far.

Capital Markets

7.89 With the growing integration of the Indian stock market due to higher trade and investment linkages with the international equity markets and the dynamic linkages of equity markets with money markets, credit markets and forex markets, the initial spillovers of the global financial turmoil on the Indian economy were felt on the BSE Sensex and S&P CNX Nifty. The integration appears to be higher with emerging markets than developed markets as reflected in higher correlations of the BSE Sensex with MSCI (Emerging) at 0.63 during 2008-09 as compared to 0.13 and 0.37 with Dow Jones and FTSE, respectively during the same period.

7.90 The global stock market crash was widespread as the stock prices in almost all countries around the world witnessed substantial correction, notwithstanding the differences across countries in terms of fundamentals and the extent of impact of the financial crisis on the real economies. Many EMEs became part of the global asset price bubble, as the turmoil in the advanced countries became widespread. The Indian equity markets largely remained weak and volatile during 2008-09 in line with the decline in international equity markets due to concerns over continued uncertainty in the global financial markets.

7.91 The BSE Sensex fell to new low at 8,106 on March 9, 2009, a decline of 60.9 per cent over the peak (as on January 8, 2008). During 2008-09, the BSE Sensex and S&P CNX Nifty decreased by 37.9 per cent and 36.2 per cent, respectively. The market capitalisation fell further to Rs. 30,86,076 crore in March 2009, a decrease of 39.9 per cent over the previous year. PE ratio stood at 13.7 as on end-March 2009, a decline of 31.8 per cent over the end March 2008. The volatility of the BSE Sensex (coefficient of variation) increased during 2008-09 to 24.2 from 13.7 in 2007-08 (Chart VII.7).



7.92 The losses suffered in the domestic stock market during 2008-09 were spread across stocks in all sectors. Metal consumer durables, capital goods and banking sector indices suffered higher losses than the average BSE Sensex during 2008-09, while information technology, auto, oil and gas, public sector units, healthcare and fast moving consumer goods sectoral indices posted relatively lower losses. The higher losses encountered by the former group of sectors of BSE Sensex perhaps revealed the greater sensitivity of these sectors to economic slowdown and the impact of the global financial crisis. The BSE mid-cap and BSE small-cap recorded higher losses during 2008-09, which could be partly because of the greater impact of credit squeeze on these categories of companies and also the greater impact of export slowdown on small and medium sized companies.

7.93 As a part of the global deleveraging process and general increase in risk aversion towards EMEs, the FIIs withdrew large amount of their investments from the Indian market. According to the data released by the SEBI, FIIs made swift reversals from large net purchases in the Indian equity market during 2007-08 to large net sales during 2008-09. Investments by mutual funds in equities also declined during 2008-09, whereas their investments in debt increased, reflecting the lesser risk involved in Government debt.

7.94 During the first quarter of 2009-10, the domestic stock markets witnessed a recovery commensurate with international stock markets and the rate of recovery turned sharper since the announcement of the general election results. The upward trend could be attributed to a number of positive developments such as reduction in policy rates in April 2009, positive results for Q4 of 2008-09 by some Indian banks and corporates, greater political stability in the post-election period and expectations of a larger stimulus in the Union Budget for 2009-10 and resumption of FIIs' interest in the domestic

equity market. The BSE Sensex and the S&P CNX Nifty as on October 06, 2009, showed gains of 74.7 per cent and 66.4 per cent, respectively, over end-March 2009. Activity in the Wholesale Debt Market segment of the NSE improved in 2008-09 with the turnover increasing by 19.0 per cent.

7.95 The capital flight that ensued in the wake of the crisis deprived Indian equity markets of FII investments to the tune of around Rs.48,249 crore (US\$ 10,439 million) during 2008-09. During the month of September to November 2008, FIIs withdrew around Rs.25,548 crore (US\$ 5,344 million). FII outflow raised serious concerns about the quality of such inflows, thereby further downplaying the market sentiment. The integration of the Indian stock markets with the global stock markets was higher (correlation of the BSE Sensex with MSCI world index at 0.78) than the integration of BSE Bankex with MSCI world bank index (0.62). This demonstrates the soundness of the Indian banking scrips which to some extent are insulated from the volatility of the international banking equity prices (Box VII.5).

Mutual Funds

7.96 As a consequence of the global liquidity squeeze, corporates withdrew their investments from domestic money market mutual funds, putting redemption pressure on the mutual funds. A substantial proportion of collections of mutual funds reflected bulk funds from the corporate sector under the money market schemes, partly reflecting tax and other regulatory arbitrage. While the mutual funds promised immediate redemption, their assets were relatively illiquid. Maturity mismatches between assets and liabilities of mutual funds further aggravated the problems.

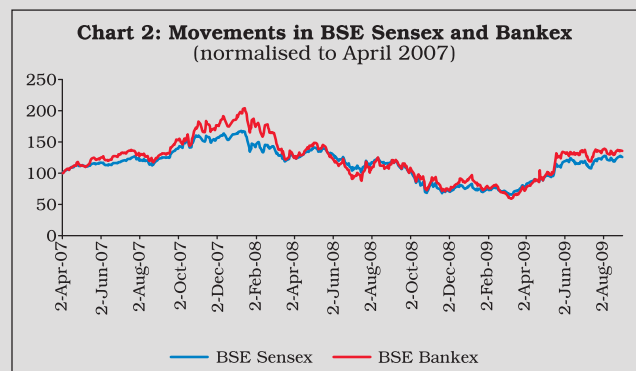
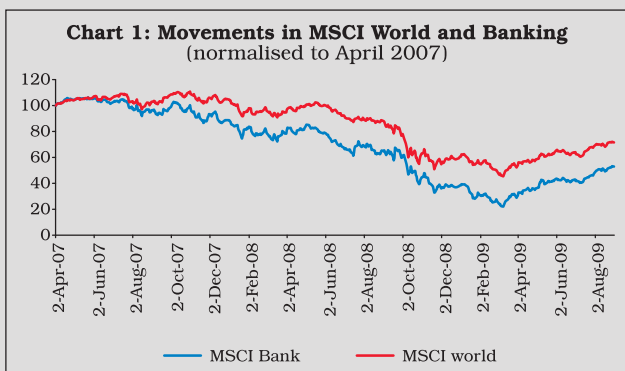
7.97 During 2008-09, net resource mobilisation by mutual funds turned negative; there was a net outflow of Rs.28,297 crore during the year as compared to a net inflow of

Box VII.5: Inter-linkages between the Capital Market and the Banking Scrips

The beginning of the current financial crisis may be traced to gradual unravelling of the US sub-prime mortgage crisis around middle of 2007. The international equity market (as reflected in MSCI world index) started to decline from August 2007. The international banking stock index (measured through MSCI world bank index) was under-performing the overall stock index up to July 2007(Chart 1). The spread between the world index and the world bank index started widening since August 2008 as international banks suffered from tighter credit markets and as further write-downs related to subprime mortgage losses continued to weigh on the financial services sector. The collapse of some major international banks added to investors concerns about the stability of the banking sector in developed countries. Perceptions of banks riskiness clearly increased over the course of the financial crisis as demonstrated by the continuous slide in international banking stock index as well as the widening of the credit default swap premia. A marked decline in the stock market performance of banks and finance companies relative to the overall stock market index continued till mid-March 2009 reflecting apprehension that banks might incur substantial losses in the crisis aftermath. The international

equity market staged a recovery, thereafter due to the large scale bail-out packages and accommodative measures taken by policy authorities. International banking equity prices has mirrored the rebound in international equity index during 2009-10, so far. The world bank index continued to under-perform the world index throughout the period till end-August 2008. The BSE index has, on the other hand, over-performed the BSE Sensex except during the period from end-May 2008 to end-August 2008 and from mid-February 2009 to end-April 2009. The close integration between global equity index and international banking index is reflected in the strong correlation between MSCI world index and MSCI world bank index (0.98), which is a shade higher than the correlation observed between BSE Sensex and BSE Bankex (0.96)(chart 2).

The integration of the Indian stock markets with the global stock markets was higher (correlation of the BSE Sensex with MSCI world index at 0.78) than the integration of BSE Bankex with MSCI world bank index (0.62). This demonstrates the soundness of the Indian banking scrips which to some extent are insulated from the volatility of the international banking equity prices.



Rs.1,53,801 crore during 2007-08. Net assets managed by mutual funds also declined by 17.4 per cent to Rs. 4,17,299 crore during 2008-09 (Table VII.3). There were substantial outflows during the months of June 2008 (Rs.39,233 crore), September 2008 (Rs.45,651 crore) and October 2008 (Rs.45,796 crore) due to the uncertain conditions in the stock markets and redemption pressures from banks and corporates on account of tight liquidity conditions prevailing at that time. The Reserve Bank then announced immediate measures to provide liquidity support to mutual funds through banks. With the easing of overall liquidity conditions, investment in mutual funds

again became attractive. During November 2008 to February 2009, net resource mobilisation by mutual funds turned positive followed by a considerable outflow of Rs.98,697 crore during March 2009. Both the number of schemes and net resource mobilisation by mutual funds declined significantly during 2008-09 as compared to the previous year. Scheme-wise, during 2008-09, income/debt oriented schemes witnessed a net outflow of Rs.32,161 crore, while growth/equity oriented schemes registered a net inflow of Rs.4,024 crore. During April-August 2009, reflecting the revival in the secondary market, resource mobilisation by mutual funds increased considerably to a net

Table VII.3: Resource Mobilisation by Mutual Funds

(Rs. crore)

Mutual Funds	2007-08			2008-09		
	Gross Mobilisation	Net Mobilisation@	Net Assets*	Gross Mobilisation	Net Mobilisation@	Net Assets*
1	2	3	4	5	6	7
Private Sector	37,80,753	1,33,304	4,15,621	42,92,750	-34,018	3,35,527
Public Sector	3,37,498	9,820	41,123	7,10,472	9,380	43,971
UTI	3,46,126	10,677	48,408	4,23,131	-3,659	37,801
Total	44,64,377	1,53,801	5,05,152	54,26,353	-28,297	4,17,299

@ : Net of redemptions.

* : As at the end of March.

Source: Securities and Exchange Board of India.

inflow of Rs.2,56,755 crore as compared with that of Rs.48,128 crore in the comparable period last year.

7.98 In the Indian context, a key objective of financial sector reform beginning the early 1990s has been to promote price discovery process in financial markets and thereby, improve allocation and operating efficiencies of intermediaries and market participants. It is now generally agreed that Indian financial markets have shown considerable maturity in terms of price discovery process. There is evidence of integration among various market segments, reflecting on the operating efficiency of financial markets. There is also evidence that financial markets are able to price various risks, which is in turn reflective of the risk management by financial intermediaries and participants to hedge against risks, devise optimal hedging strategies, establish trading strategies and make portfolio allocation decisions. The risk pricing could imply operating efficiency on the part of financial intermediaries and other market participants. Such efficiency in turn contribute to efficiency in allocation of resources to productive sectors, thereby, leading to a more matured and developed financial system (Box VII.6).

Payment and Settlement System

7.99 During the global financial turmoil, the payment systems everywhere have functioned

well both for retail customers and enterprises as well as for banks and other financial institutions. They have, thus, helped to maintain economic activity during a period when confidence in counterparties has been at low ebb (Box IV.4 in Chapter I).

7.100 The payment and settlement systems in India functioned normally in the midst of the global financial crisis, ensuring the continued confidence of the public in these systems. The Reserve Bank as the Central Bank of the country has played a catalytic role, over the years, in creating an institutional framework for development of a safe, secure, sound and efficient payment system in the country. In order to strengthen the institutional framework for the payment and settlement system in the country, BPSS as a Committee of the Central Board was constituted by the Reserve Bank in March 2005. The BPSS was reconstituted in August 2008 following the notification of PSS Act and BPSS regulations, 2008.

7.101 The total turnover under various payment and settlement systems rose by 13.9 per cent in terms of value during 2008-09 as compared with 41.8 per cent during 2007-08. As a ratio to GDP, the annual turnover in terms of value increased marginally from 12.7 per cent in 2007-08 to 12.9 per cent in 2008-09. The Systemically Important Payment System's (SIPS) share in the total turnover accounted for 53.8 per cent followed by Financial Markets' Clearing at 33.9 per cent. The SIPS continued to exhibit

Box VII.6: Risk Pricing in India's Financial Markets

One of the lessons learned from various crises across the emerging market economies, which occurred during the late 1990s and the early part of the current decade, and the global crisis originating from an advanced economy such as the US in the more recent period is that it is useful to have continuous assessment and monitoring of the risk-pricing mechanism underlying the financial markets for policy purposes.

In the Indian context, a key objective of financial sector reform beginning the early 1990s has been to promote price discovery process in financial markets and thereby, improve allocation and operating efficiencies of intermediaries and market participants. The reform process has completed two decades. It is now generally agreed that Indian financial markets have shown considerable maturity in terms of price discovery process. There is evidence of integration among various market segments, reflecting on the operating efficiency of financial markets (Bhoi and Dhal, 1999, RBI 2005-06).

In terms of risk pricing, studies based on univariate Generalised Autoregressive Conditional Heteroskedasticity (GARCH) model provide various perspectives (Misra and Dhal, 2009). First, the various segments of financial markets, excepting the corporate bond yield, exhibited their ability to price risks. Financial markets at short-end showed their ability to price risks. At the long end of the market, the sensitiveness of the equity market to international integration and the absence of risk pricing in the long-term corporate bond market segment require some thoughts on developing these market segments further. Second, the underlying risk pricing mechanism for various interest rates could be different from that of the equity returns. In particular, the conditional measure of risk arising from the GARCH model had positive impact on the conditional mean of various interest rate spreads, reflecting the trade-off between risk and return in the associated markets. On the other hand, the conditional risk showed inverse relationship with equity return, attributable to the leverage effect as postulated

in the finance literature. Third, different market segments pertaining to liquidity, interest rate, credit, exchange rate and asset prices exhibited different volatility persistence. Fourth, money market interest rates, forward exchange rate premium and equity prices showed significant asymmetric response to good (bad) news, attributable to information efficiency. Fifth, all financial variables were found to be consistent with non-standard generalised error distribution. This implied that markets also took into account skewness and kurtosis measures influenced by the extreme movements as part of pricing risks. Sixth, international integration accentuated risk pricing in the domestic stock market in terms of higher mean and risk-return trade off.

From policy perspective, an understanding of the risk pricing mechanism assumes importance in many ways. The ability of markets to price various risks could reflect on the risk management by financial intermediaries and participants to hedge against risks, devise optimal hedging strategies, establish trading strategies and make portfolio allocation decisions. Also, risk pricing could imply for operating efficiency on the part of financial intermediaries and other market participants. Such efficiency in turn contribute to efficiency in allocation of resources to productive sectors, thereby, leading to a more matured and developed financial system.

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the rising trend and there was an increase of 12.2 per cent in terms of value in 2008-09 on top of the increase of 39.6 per cent in the previous year. The rise was mainly contributed by increase in Real Time Gross Settlement (RTGS) transactions in 2008-09, while high value clearing component of SIPS, declined by 17.3 per cent during the year. This decline in high value SIPS clearing could be due to shift from paper based transactions to electronic modes of payments like RTGS, besides the

impact of the general slowdown in the economy on the value and volume of such transactions.

7.102 The trends in the volume and value of paper clearing versus electronic clearing over the recent years show that while in value terms the share of electronic transactions has increased significantly, in volume terms paper based transactions still dominate (Table VII.4).

7.103 Banks have been advised to encourage their customers to use NEFT which is a nation-

Table VII.4: Volume of Transactions and Value of Transactions

(Volume in '000s and Value in Rs. crore)

1	Volume				Value			
	Paper Based	Electronic *	Total	Share of Electronic (in per cent)	Paper Based	Electronic*	Total	Share of Electronic (in per cent)
2	3	4	5	6	7	8	9	
2003-04	10,22,800	1,67,547	11,90,346	14.1	1,15,95,960	48,90,962	1,64,86,922	29.7
2004-05	11,66,848	2,30,016	13,96,864	16.5	1,04,58,895	1,09,09,497	2,13,68,392	51.1
2005-06	12,86,758	2,87,421	15,74,179	18.3	1,13,29,134	1,94,86,152	3,08,15,286	63.2
2006-07	13,67,280	3,83,358	17,50,638	21.9	1,20,42,426	30,31,79,623	4,23,60,389	71.6
2007-08	14,60,564	5,42,123	20,02,687	27.1	1,33,96,066	4,66,89,754	6,00,85,820	77.7
2008-09	13,95,906	6,82,299	20,78,205	32.8	1,24,61,202	5,59,72,211	6,84,33,413	81.8

Note: *includes ECS Dr. , ECS Cr. , EFT, RTGS, CARDS, CCIL.

wide electronic fund transfer system. As at the end of March 2009, 55,225 branches of 89 banks were participating in NEFT. To encourage the retail electronic payment systems various measures were initiated by the Reserve Bank, viz., (i) facilitating initiation of NEFT transactions by accepting cash from walk-in customers (from the earlier account to account transfer), (ii) option to make credit card payments, (iii) extending the settlement time window for NEFT by one and half hours. Reflecting these, there has been substantial increase in both the volume and amount of transactions in retail electronic fund transfer systems during 2008-09.

7.104 ATMs have become an important channel for delivering banking transactions and services in India, particularly for cash withdrawal and account balance enquiry. The spread of ATMs has increased from 34,789 in March 2008 to 43,651 in March 2009. In March 2008, the population per ATM in India was more than 29,500 as against the range of 1,000 – 9,500 in some of the EMEs.

7.105 RTGS System in operation since March 2004 is primarily for large value transactions with the minimum threshold limit at Rs.1 lakh. The number of RTGS enabled bank branches stood at 55,006 as on March 31, 2009 with the addition of 11,494 branches to the RTGS network during the year 2008-09. The increased

network coverage is reflected in the increase in the volume and value settled in RTGS. RTGS peak volume and value in a day were 1,28,295 transactions and Rs.2,73,450 crore, respectively, on March 30, 2009. At end-August 2009, the bank/branch coverage of RTGS further increased to 58,720 branches. The daily average volume of 90,000 transactions it about Rs.1,20,000 crore of which 82,000 transactions for about Rs.98,000 crore pertain to customer transactions at end-August 2009.

7.106 The Reserve Bank took the initiative of setting up the Clearing Corporation of India (CCIL) with some of the major banks as its core promoters to upgrade the country's financial infrastructure in respect of clearing and settlement of debt instruments and forex transactions. CCIL currently provides guaranteed settlement facility for Government securities clearing, clearing of CBLO and foreign exchange clearing. Assessment of CFSA on Central Counterparties is given in Box VII.7.

7.107 The development of corporate bond market in India lagged behind in comparison with other financial markets owing to many structural problems. To facilitate settlement of Over the Counter (OTC) corporate bond transactions in RTGS system on a DuP-I basis, it was decided to allow the clearing houses of the exchanges to have a transitory pooling account

Box VII.7: Central Counterparties – The Assessment by CFSA

The role of CCIL as the only CCP catering to money, securities and forex markets, leads to concentration risk. Though concentration of business with CCIL helps pool the risks and reduce the overall transaction costs for the system, the risk management systems in CCIL should be further strengthened. CCIL may endeavour to develop capacity to measure intra-day exposure and margin requirements (based on intra-day exposures) for Government securities, CBLO and forex segments.

The assessment of NSCCL and BOISL/BSE in the equities settlement systems shows that they comply with all recommendations.

CCIL is compliant with the recommendations pertaining to, among others, legal risk, participation requirements, operation risk management, governance and regulation and oversight. The major issues brought out in the assessment pertain to the lack of adequate financial resources, measurement and management of credit exposures, money settlements and default procedures.

Though the CCIL's risk management systems are satisfactory, concomitant with the increase in its business, its liquidity requirements have also increased. As part of its operations, CCIL also encounters intra-day liquidity

shortfalls. To tide over the intra-day liquidity requirements, CCIL has availed of dedicated Lines of Credit (LoC) from a few commercial banks. Given the significant increase in the volumes of trade in the debt, money and forex markets and as the settlements at CCIL are effectively taking place at the end of the day, it would be very difficult for CCIL to raise liquidity from commercial banks equivalent to international benchmarks. The grant of a limited purpose banking licence will enable CCIL to avail of a repo window with another bank or from the Reserve Bank to fulfill the requirement of additional liquidity, when needed. Appropriate amendments in the legal provisions could be considered, making it easier to go ahead with issuing differentiated bank licenses for this purpose.

The CFSA has noted that initially CCIL was operating with lines of credit facilities from various banks for up to Rs.400 crore, which were subsequently increased to Rs.1,300 crore, and this is being further enhanced to Rs.1,600 crore. CCIL is also in the process of putting in place the concept of clearing member under which the settlements will be done only in the books of a few members, in which case the liquidity requirements in the CCIL system may come down automatically.

facility with the Reserve Bank. A transitory pooling account for National Securities Clearing Corporation Limited (NSCCL) has since been opened for settlement of corporate bond transactions in RTGS. The settlement of corporate bond transactions will be on a non-guaranteed basis and hence line of credit (LOC) support will not be provided, however, banks participating in the settlement would be eligible for intraday liquidity (IDL) support of the Bank.

7.108 To sum up, the Reserve Bank could restore normalcy in the financial markets over a short time period through its liquidity operations in both domestic currency and foreign currency; the absence of any direct exposure of the Indian banks and financial institutions to the troubled assets and failing financial institutions in the advanced countries helped in the avoidance of any serious stress in the financial system. In line with the global experience, in India also the payment and settlements system functioned efficiently and provided a robust infrastructure for financial stability.

7. How India ensured Financial Stability

7.109 Ensuring financial stability is a prime concern for monetary policy in India while maintaining growth momentum at reasonable levels and giving a high priority to price stability. Financial stability in India has been sought to be achieved through perseverance of prudential policies which prevent institutions from excessive risk taking, and financial markets from becoming extremely volatile and turbulent. As a result, while there are orderly conditions in financial markets, the financial institutions, especially banks, reflect strength and resilience. Certain policy measures, as described below, were adopted to ensure financial stability.

Investment Portfolio

7.110 In the year 2000, the Reserve Bank conducted a stress test of the banks' investment portfolio in an increasing interest rate scenario, when the general trend then was decreasing interest rates. At that time, banks in India were

maintaining a surrogate capital charge for market risk, which was at a variance from the Basel norms. On the basis of the findings, in order to equip the banking system to be better positioned to meet the adverse impact of interest rate risk, banks were advised in January 2002 to build up an Investment Fluctuation Reserve (IFR) within a period of five years. The prudential target for the IFR was 5 per cent of their investments in 'Held for Trading' (HFT) and 'Available for Sale' (AFS) categories. Banks were encouraged to build up a higher percentage of IFR up to 10 per cent of their AFS and HFT investments. This counter-cyclical prudential requirement enabled banks to absorb some of the adverse impact when interest rates began moving in the opposite direction in late 2004. Banks have been maintaining capital charge for market risk as envisaged under the Basel norms since end-March 2006.

7.111 The regulatory guidelines in India require banks to classify their investments in three categories, similar to the international standards. The investments included in the Held to Maturity (HTM) category was capped at 25 per cent of the total investments and banks are allowed to carry the investments in the HTM category at cost, subject to amortisation of premium, if any. With the change in the direction of the movement of interest rates in 2004, the cap on the HTM category was reviewed in the light of the statutory prescriptions (referred to as SLR in India) requiring banks to mandatorily invest up to 25 per cent of their net Demand and Time Liabilities (DTL) in eligible Government securities. In view of the statutory pre-emption and the long duration of the Government securities, banks were permitted to exceed the limit of 25 per cent of total investments under Held to Maturity (HTM) category provided the excess comprised only of the SLR securities, and the total SLR securities held in the HTM category was not more than 25 per cent of their NDTL. Such shifting was allowed at acquisition cost or book value or

market value on the date of transfer, whichever is the least, and the depreciation, if any, on such transfer was required to be fully provided for. The above transition is consistent with international standards that do not place any cap on HTM category, and was considered advisable taking into account the statutory nature of the SLR while ensuring prudence and transparency in valuation on transfer to HTM category. While the earlier prescription for this category was relatively more conservative, the changes in September 2004 recognised the dynamic interface with the interest rate cycles and were counter-cyclical.

Capital Adequacy – Risk Weights

7.112 In view of the increase in growth of advances to the real estate sector raising concerns about asset quality and the potential systemic risks posed by such exposure, banks were advised to put in place a proper risk management system to contain the risks involved. Banks were also advised to put in place a system for ensuring proper checking and documentation of related papers before sanctioning/disbursing of such loans. In June 2005, the Reserve Bank advised banks to have a board mandated policy in respect of their real estate exposure covering exposure limits, collaterals to be considered, margins to be kept, sanctioning authority/level and sector to be financed.

7.113 Through pre-emptive countercyclical provisioning and a differentiated risk weight stipulation for 'sensitive sectors', the adverse impact of high credit growth in some sectors and asset price fluctuations on banks' balance sheets were contained (Box VII.8). In the light of the strong growth of consumer credit and the volatility in the capital markets, it was felt that the quality of lending could suffer during the phase of rapid expansion. Hence, as a counter cyclical measure, the risk weight for consumer credit and capital market exposures was raised from 100 per cent to 125 per cent.

Box VII.8: Counter-Cyclical Prudential Regulations – The Indian Experience

In the context of the present global financial meltdown, an issue that has received considerable attention from policy makers world over is that of counter-cyclical financial measures including counter-cyclical prudential regulation and supervision of banks and financial institutions. There is a consensus in the theoretical literature that financial institutions including banks tend to behave in a pro-cyclical manner. The various reasons for such pro-cyclical behaviour by financial institutions as described in the literature are herd behaviour, “disaster myopia” and growing competition among financial institutions during periods of economic upturns (Jimenez and Saurina, 2005). Apart from these reasons, some inherent weaknesses in the prudential regulatory structure itself can also contribute to the pro-cyclical behaviour of banks. This underlines the rationale behind the need for designing counter-cyclical prudential regulations to ensure financial stability.

After making a thorough review of the pro-cyclical nature of the existing regulatory framework, the Financial Stability Forum (FSF, 2009) suggested that regulatory authorities should use the flexibility within the Basel framework to ensure that risk management, capital buffers, and estimates of potential credit losses are appropriately forward-looking and take account of uncertainties associated with models, valuations and concentration risks and expected variations through the cycle. The dynamic provisioning, leverage ratio, capital insurance, counter-cyclical capital buffers, time-varying capital requirements, are some of the commonly discussed counter-cyclical prudential measures in the literature. The Bank of Spain has already adopted dynamic provisioning as an attempt to limit the pro-cyclical nature in the banking system. The leverage ratio has also been accepted by some of the countries such as United States.

India, also adopted a counter-cyclical approach through a calibrated increase in the risk weights and provisioning requirements during the period of rapid credit growth. However, the important difference was that Indian approach entailed sector-specific prescriptions. To illustrate, the housing loans and commercial real estate are the sectors which experienced high credit growth during the high credit phase of 2002-03 to 2006-07. Accordingly, the movement in risk weights on real estate lending and mortgage backed securities over the years are given in the Table. The objective was not so much to lean against the wind of rising asset prices but as a cautionary measure to contain the exposure of the banking sector to sensitive asset classes where rapid credit expansion was observed (Gopinath, 2009).

The Reserve Bank in 2009 stated that it is necessary that banks do realise the importance of building buffers such as floating provisions in good times so that they are able to use these in adverse circumstances. Therefore, in India, banks are encouraged to build floating provisions as a buffer for the possible stress on asset quality later. In this regard, the Reserve Bank instructed the banks that the floating provisions can only be utilised for making specific provisions in extraordinary circumstances and cannot be reversed back to the profit and loss account by way of credit. Until such utilisation, these provisions can be netted off from gross NPAs to arrive at disclosure of net NPAs, or alternatively, they can be treated as part of Tier II capital within the overall ceiling of 1.25 per cent of total risk weighted assets. However, this policy will be modified once the on-going work by FSB, BCBS, CGFS and accounting standard setters on measures to mitigate pro-cyclical nature including counter cyclical provisioning is finalised.

Table: Risk Weights and Provisioning on Housing Loans and Real Estate Lending

Year/Month	Amount of Loan	Housing Loans		Commercial Real Estate	
		Risk Weight (%)	Provisions on Standard Assets (%)	Risk Weight (%)	Provisions on Standard Assets (%)
Before May 2002		100	0.25	100	0.25
May 2002		50	0.25	100	0.25
December 2004		75	0.25	100	0.25
July 2005		75	0.25	125	0.25
March 2006		75	0.40	125	0.40
May 2006	Upto Rs.20 lakh	75	0.40	150	1.00
	Above Rs.20 lakh	75	1.00		
January 2007	Upto Rs.20 lakh	75	0.40	150	2.00
	Above Rs.20 lakh	75	1.00		
May 2007	Upto Rs.20 lakh	50	0.40	150	2.00
	Above Rs.20 lakh	75	1.00		
May 2008	Upto Rs.30 lakh	50 (LTV=75%)	0.40	150	2.00
		100 (LTV>75%)			
		75 (LTV=75%)			
November 2008	Upto Rs.30 lakh	100 (LTV>75%)	1.00	100	0.40
		50 (LTV=75%)	0.40		
		100 (LTV>75%)			
		75 (LTV=75%)			
	Above Rs.30 lakh	100 (LTV>75%)			

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2. Gopinath, S (2009), “Lessons for Financial Policy Making – Interpreting the Dilemmas”, Inaugural Address delivered at 10th FIMMDA-PDAI Annual Conference at Mumbai on March 3.
3. Jimenez, Gabriel and Jesus Saurina (2005), “Credit Cycles, Credit Risk and Prudential Regulations”, Banco de Espana, Spain.

Provisions against Standard Assets

7.114 The provisions for standard assets were revised progressively in November 2005, May 2006 and January 2007, in stages in view of the continued high credit growth in the real estate sector, personal loans, credit card receivables, and loans and advances qualifying as capital market exposure and a higher default rate with regard to personal loans and credit card receivables, which emerged as a matter of concern. The standard assets in the following categories of loans and advances attract a two per cent provisioning requirement (i) personal loans (including credit card receivables); (ii) loans and advances qualifying as capital market exposure; (iii) real estate loans (excluding residential housing loans), and (iv) loans and advances to systemically important non-deposit accepting non-banking finance companies (NBFC-ND-SI). In order to ensure continued and adequate availability of credit to the highly productive sectors of the economy, the provisioning requirement for all other loans and advances, classified as standard assets was kept unchanged, *viz.*, (i) direct advances to the agricultural and SME sectors at 0.25 per cent; and (ii) all other loans and advances at 0.4 per cent. The provisioning requirement for all types of standard assets was reduced to a uniform level of 0.40 per cent in November 2008 except in the case of direct advances to agricultural and SME sectors, which shall continue to attract a provisioning of 0.25 per cent, as hitherto.

7.115 It may be relevant to highlight some of the specific features of Indian system that have contributed to achieve financial stability:

- Banks are required to hold a minimum percentage of their liabilities in risk free Government securities under the SLR system. This stipulation ensures that banks are buffered by liquidity in times of stress.
- The capital account was managed actively. In the face of large capital inflows during 2006-08, the resultant excess liquidity was sterilised through calibrated hikes in the CRR and issue of MSS securities. When the flows reversed during the last quarter of 2008, the measures were reversed. CRR was cut and the MSS securities were bought back to inject liquidity into the banking system.
- To ensure that securitisation is value adding, 'true sale' is insisted on, and credit enhancements and liquidity support are subject to capital regulations. It is required that profit from sale of assets to SPVs to be amortised over the life of the securities issued.
- Access to overnight unsecured call market is restricted to banks and primary dealers. Other entities can access the overnight market only through collateralised instruments which are cleared and settled on a guaranteed basis through a central counterparty.
- Regulation and oversight have been extended to systemically important non-deposit taking, non-banking finance companies, and this has limited leverage and space for regulatory arbitrage.
- Systemic interconnectedness has been addressed by bringing banks' exposures to non-bank finance companies within the prudential framework.
- Central counterparty (CCP) clearing and guaranteed settlement is currently operative for Government securities transactions and inter-bank rupee-USD forex transactions. CCP guaranteed arrangements for forex forwards and OTC rupee interest rate swaps are underway.
- In addition, the Reserve Bank's guidelines in respect of exposure to inter-bank liability, securitisation, banks' investment in non-SLR securities and marking-to-market over the years, have helped.

Financial Stability Unit in RBI

7.116 The Reserve Bank used both monetary and regulatory measures to maintain financial stability. This synergistic approach has been possible because the Reserve Bank is both the monetary authority and the regulator of banks, non-banks and a large segment of the financial markets. On the way forward, Indian financial markets will deepen and broaden further and will also be increasingly exposed to the forces of globalisation. All this will have implications for the financial stability. The Reserve Bank is conscious of the need to pay increasing attention to financial stability and to improve the required skills in this area. As a beginning in this direction, the Reserve Bank has set up a multi-disciplinary Financial Stability Unit to put out a regular Financial Stability Report. The first report is planned in the next few months. These reports will present an overall unified assessment of the health of the financial system with a focus on identification and analysis of potential risks to systemic stability.

Sources of Vulnerability in India's Financial System

7.117 Way forward, financial stability analysis in India needs to take into account the key sources of vulnerability in the financial system. Some of them are as below:

Infrastructure Financing

7.118 A concern has been raised that infrastructure funding by banks constitutes a potential area of macroeconomic vulnerability. An investment requirement of roughly Rs.22,50,000 crore has been projected as financing requirements for physical infrastructure (comprising roads, power, telecom, railways, airports and ports) in India over the Eleventh Plan period, of which an amount of roughly Rs.6,75,000 crore is to be funded by the private sector. With budgetary resources limited, the Government has sought

to foster a policy and procedural environment that actively encourages public-private partnerships (PPP) and, increasingly, it is perceived that commercial entities such as banks could play an important role in this respect. The significant challenge for the banking sector in funding the growing infrastructure need would emanate from the asset-liability mismatch as the maturity of banks' assets has become longer term while their liabilities have become shorter. Banks will also reach exposure limits to large developers. Lending by NBFCs will be constrained, as they rely to a large extent on unsecured borrowings and to a certain extent on commercial banks for their funding and the cost would be higher due to prudential requirements for bank lending to NBFCs. External Commercial Borrowing has to be managed prudently, in keeping with resulting macroeconomic vulnerabilities and desirable levels of capital flows.

Dependence of Banks on Bulk Deposits and Purchased Liquidity

7.119 Typically, banks can meet their liquidity needs by two methods: stored liquidity and purchased liquidity. Stored liquidity uses on-balance sheet liquid assets and a well-crafted deposit structure to provide all funding needs. Purchased liquidity uses non-core liabilities and borrowings to meet funding needs. While dependence on stored liquidity is considered to be safer from the liquidity risk perspective, it has cost implications.

7.120 An observed trend for Indian banks is that there is growing dependence on purchased liquidity and also an increase in the illiquid component in banks' balance sheets with greater reliance on volatile liabilities, like bulk deposits to fund asset growth. With this, there could emerge liquidity and profitability implications. An increase in growth in housing loans, real estate exposure as also infrastructure has resulted in elongation of the maturity profile of bank assets. Simultaneously, there has been a

shortening of residual maturities, leading to a higher asset-liability mismatch.

7.121 There is a need to strengthen liquidity management in this context as also to shore up the core deposit base and to keep an adequate cushion of liquid assets to meet unforeseen contingencies. A balanced approach to liquidity strategy in terms of dependence on stored and purchased liquidity is the most cost-effective and optimal risk strategy. What needs to be borne in mind is that while at an individual bank level, retail deposits may be volatile, but for the banking system as a collective whole, it provides solid foundation for the banks to fund their long term assets like infrastructure and similar business activities. Dependence of the banks on bulk resources, however, needs to be contained.

8. Overall Assessment and Way Forward

7.122 Like all other policy measures, maintenance of financial stability involves trade-offs and throws up a number of challenges. Important challenges that need to be addressed on the way forward are the following:

7.123 Some of the critical elements, as indicated below, of any financial stability framework, need to be addressed:

- Excessive volatility of macro-variables such as interest rates and exchange rates which have direct impact on the real economy;
- Build-up of significant leverage in financial, corporate and household sector balance sheets;
- The moral hazard risks posed by institutions that have become ‘too-big-to-fail’ or too interconnected or complex to resolve;
- Internal systemic buffers within the financial sector, both at the institution and systemic levels, to counter potential shocks to the economy;
- Putting in place a strong policy and institutional mechanisms;

- Prevalence of unregulated nodes in the financial sector which, through their interconnectedness with the formal regulated system, can breed systemic vulnerabilities.

7.124 Second, the crisis has triggered an active discussion on an appropriate regulatory structure that is best suited to safeguard financial stability. There are several regulatory models around including those where the central bank is a pure monetary authority with bank regulation and supervision vested with another agency. Post-crisis, the emerging view is that the crisis was caused, at least in part, by the lack of coordination and communication between the separate bodies and that it is optimal, in the interest of financial stability, to entrust the function of regulation of banks and non-banks also to central banks.

7.125 Third issue is managing the trade-offs between growth and financial stability. In order to safeguard financial stability, the Reserve Bank has traditionally used a variety of prudential measures such as specifying exposure norms and pre-emptive tightening of risk weights and provisioning requirements. But these measures are not always costless. For instance, tightening of risk weights tempers the flow of credit to certain sectors, but excessive, premature or unnecessary tightening could blunt growth. Thus, as in the case of price stability, central banks face the challenge of managing the trade-off between financial stability and growth.

7.126 Fourth, reforming regulatory architecture is assuming significance as the central banks are vigorously reinventing themselves and almost all countries are reviewing their regulatory architectures. Two key lessons are driving this change: first that the responsibility for financial stability cannot be fragmented across several regulators; it has to rest unambiguously with a single regulator, and that single regulator optimally is the central bank. Second, there is need for coordination

across regulators on a regular basis and for developing a protocol for responding to a crisis situation. In this context, regulatory coordination is important as in India, there are a host of regulators in the financial sector - RBI, SEBI, IRDA and PFRDA. In order to facilitate coordination between them, there is a High Level Coordination Committee on Financial Markets (HLCC-FM) comprising all the regulators and the Finance Secretary. While the Governor of the Reserve Bank chairs the HLCC-FM, the Ministry of Finance provides the secretariat. The meetings are informal and there is free exchange of positions, views and opinions. There is a view that the HLCC-FM should be given a formal structure. While a formal structure will have the merit of enforcing accountability, the flip side is that it may make the forum excessively bureaucratic and detract from its other value adding features.

7.127 Currently, the arrangement for regulation of financial markets is as follows. Apart from banks, NBFCs and other financial institutions, RBI regulates the money market, the Government securities market, the credit market and the foreign exchange market and the derivatives thereon. In respect of OTC derivatives, only those derivatives where one party to the transaction is an the Reserve Bank regulated entity have legal validity. In respect of products traded on the exchanges, procedures for trade execution fall within the regulatory purview of SEBI. Thus, unlike many countries, India has established procedures for regulation of OTC derivatives.

7.128 Unlike equity prices, interest rates and exchange rate are key macroeconomic variables with implications for monetary policy and overall macroeconomic stability. In addition, banks dominate the interest and exchange rate markets. By also being the regulator of these markets, the Reserve Bank is in a position to exercise oversight of institutions, markets and products, to monitor market developments, sense impending developments, take advance

action, prevent excessive volatility and maintain financial stability at the systemic level. This is an arrangement that has stood the test of time, has protected financial stability even in the face of some severe onslaughts. It may be desirable to continue with the present arrangement in the interest of preserving financial stability.

7.129 A question in the reform of regulatory architecture is about whether a central bank should also be a banking regulator. Pre-crisis, there was a dominant argument for separation of the monetary and regulatory functions premised on a possible conflict of interest. According to this view, if financial stability becomes the dominant concern of a central bank, it could result in a moral hazard for banks. The crisis has also shown that there are clear synergies between monetary policy management and financial sector regulation. It is worth noting that some advanced economies where regulation and supervision are with an agency other than the central bank are themselves revisiting their regulatory structures and contemplating some unification.

7.130 Fifth, the tension between fiscal and monetary policies that could potentially militate against financial stability. If Governments continue to incur large fiscal deficits, it may be difficult for central banks to maintain price stability. While the current crisis has shown that price stability is not sufficient to ensure financial stability, price stability is decidedly a necessary condition for financial stability. Higher inflation could also push the yield curve upwards. This could result in significant mark to market losses for fixed income instruments with potentially adverse implications for banks' profitability.

7.131 In India, elements of macro-prudential regulation were visible even before the global crisis started, in terms of counter-cyclical use of riskweights and provisioning norms. In view of the interconnectedness between banks and institutions, financial markets, and the economy, systemic risk analysis needs to involve

assessing the changing dynamics between these three segments on a continuous basis. Vulnerability in any of these segments has the potential to amplify and become systemic in view of the strong inter-linkages.

7.132 The ongoing international initiatives indicate a multipronged approach, covering several important aspects of stability : (a) introducing automatic stabilisers into the regulatory framework by adopting counter-cyclical capital charge; (b) adequacy and quality of capital as per Basel-II risk based capital framework, and simultaneous use of simpler measures such as the leverage ratio ; (c) capital requirements for reputational and other risks in respect of securitisation activities and activities undertaken by the sponsored or connected conduits/shadow banks; (d) capital treatment for trading book exposures, and the need for supplementing value-at-risk approach with incremental risk charge ; (e) strengthened Pillar 2 supervision, focusing on risk

concentration, off-balance sheet exposures, valuations of financial instruments, access to funding liquidly during hypothetical possibility of a financial crisis, stress test practices adopted in banks and system level stress-tests and their integration into capital and liquidity planning; and (f) promotion of market discipline under Pillar 3 through better disclosure and clarity on the risk associated with exposure to certain instruments. The international deliberations have also highlighted other important issues like the risk associated with distorted incentive structures for the market players, the inadequacy of self regulation for rating agencies, the deficiencies of models for risk analysis and measurement, and the need for improving market structure for derivatives. The emerging international standards and best practices would have to be carefully examined from the stand point of their relevance to India, while further strengthening the domestic financial stability framework to avoid systemic stress on the financial system.