Financial Stability Report

Issue No. 7

Reserve Bank of India
June 2013

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Foreword

This issue of the Financial Stability Report (FSR), the 7th in the series, coincides by happenstance with the fifth anniversary of the collapse of Lehman Brothers that triggered the biggest financial crisis of our times. Subsequently, the Euro Area sovereign debt crisis added fuel to the fire. Concerted action by governments, central banks, regulators and multilateral institutions helped to douse the inferno, but the embers still glow.

This FSR is set in an environment of continued uncertainty at the global level and diffidence on the domestic front. The slowdown in growth is the most worrisome factor, as industrial activity is stubbornly subdued and services remain below trend. Policy measures initiated to improve the fiscal situation have, however, provided some reassurance, and international investors are taking note of this in their assessment of the outlook for India. Following the measures taken to ease the supply bottlenecks, the growth outlook for 2013-14 is relatively optimistic as evidenced by the forecasts of the International Monetary Fund (IMF), the World Bank and the Reserve Bank's own estimates. The asset quality of banks has shown improvement, albeit marginal, since the last FSR (December 2012), but it is too early to make a definitive inference about whether this is a trend.

This FSR highlights *inter alia* the risk to macroeconomic stability from the rising current account deficit (CAD). Cross border volatile capital flows have made India vulnerable to sudden stops and reversals, as evidenced recently, following the slightest hint of exit from quantitative easing (QE) by the Federal Reserve. Both the Government and the Reserve Bank have taken measures to dampen the import of gold in order to restrain the CAD to a more sustainable level. In the short-term, our efforts have been directed at financing the CAD as that will give space and time to put in place structural reforms that will address the more deep-seated problems confronting the economy. While stress tests reveal that the financial system is resilient to shocks currently, deteriorating macroeconomic stability can eventually erode financial stability.

The perception that India is a difficult country to do business in persists, and is inhibiting investment, especially foreign investment. We need to introspect why we rank so low on indices like the Economic Freedom Index (111/144)[1] or Global Competitive Index (59/144)[2] and why we keep slipping in these rankings.

This FSR also takes stock of the progress in the implementation of the post crisis G20/ Financial Stability Board (FSB) reforms in India in areas like Basle III, regulatory framework, OTC derivatives, supervision of Systemically Important Financial Institutions (SIFIs), oversight of shadow banking, legal entity identifier (LEI) and the like. The nature of the problems and the pace of recovery have differed across jurisdictions, so have their policy responses. The impediments to progress in the implementation of reforms in the form of cross border issues and extraterritorial implications of certain national laws have also been discussed.

In the years before the crisis, the financial sector took on a life of its own with a growing belief that real growth can be generated by sheer financial engineering. That myth is now demolished. We now know that the financial sector has no standing of its own; it matters only to the extent that it aids the growth of the real sector. It is this wisdom that must guide the ongoing global effort at financial sector reforms; it is this wisdom that must inform the Reserve Bank's policies and actions.

Dr. D. Subbarao
June 27, 2013

[1] Fraser Institute Canada. (www.freetheworld.com)
[2] World Economic Forum: The Global Competitiveness Report 2012-2013

Contents

Page No.

LIST OF BOXES

LIST OF CHARTS

Page No.

LIST OF TABLES

List of Select Abbreviations

ALM	Assets Liability Management
AMA	Advanced Measurement Approach
AML	Anti-Money Laundering
ATM	Average Time to Maturity
AUM	Assets Under Management
BCBS	Basel Committee on Banking Supervision
BEICFs	Business Environment and Internal Control Factors
BMC	Base Minimum Capital
BoP	Balance of Payment
BR Act	Banking Regulation Act
BRICS	Brazil, Russia, India, China and South Africa
BSE	Bombay Stock Exchange
BSI	Banking Stability Index
BSMD	Banking System's Portfolio Multivariate Density
BSMs	Banking Stability Measures
CAD	Current Account Deficit
CBLO	Collateralised Borrowing and Lending Obligation
CCIL	Clearing Corporation of India Limited
CCP	Central Counter party
CCR	Central Credit Register
CD	Certificate of Deposits
C-D Ratio	Credit-Deposits Ratio
CDS	Credit Default Swap
CEA	Commodity Exchange Act
CFTC	Commodity Futures Trading Commission
CME	Capital Market Exposure
CPI	Consumer Price Index
CPSS	Committee on Payment and Settlement Systems
CRAR	Capital to Risk Weighted Assets Ratio
CRR	Cash Reserve Ratio
DB	Defined Benefit
DCCO	Date of Commencement of Commercial Operation
DCO	Derivatives Clearing Organisation
DIIs	Domestic Institutional Investors
DP	Documents against Payment
DTC	Direct Tax code
EA	Euro Area
EAD	Exposure at Default
EBIT	Earnings before Interest, Tax
EBITDA	Earnings before Interest, Tax, Depreciation and Amortisation
ECB	External Commercial Borrowings
EDD	Enhanced Due Diligence
EEFC	Export Earner's Foreign Currency (Account)
EL	Expected Losses
EMEs	Emerging Market Economies
EMIR	European Market Infrastructure Regulation
ES	Expected Shortfall
ESMA	European Securities and Market Authority
EU	European Union
EVM Chip	Europay, MasterCard and Visa Chip
FB	Foreign Bank
FC	Financial Conglomerate
FCNR(B)	Foreign Currency Non-Resident (Banks) (Account)
FDI	Foreign Direct Investment
FED	Federal Reserve
FII	Foreign Institutional Investor
FMI	Financial Market Infrastructure
FOMC	Federal Open Market Committee
FRA	Forward Rate Agreement
FSB	Financial Stability Board
FSDC	Financial Stability and Development Council
FSR	Financial Stability Report
G20	Group of 20 Nations
GDP	Gross Domestic Product
GFD	Gross Fiscal Deficit
GIC	General Insurance Corporation
GNPA	Gross Non-Performing Advances
GOI	Government of India

G-Sec	Government Securities
GSIB	Globally Systemically Important Bank
HFT	High-Frequency Trading
HLEG	High-level Expert Group
HQLA	High-Quality Liquid Assets
IAS	Investment Advisory Services
ICB	Independent Commission on Banking
ICCL	Indian Clearing Corporation Limited
IIB	Inflation Indexed Bond
IIP	Index of Industrial Production
IMF	International Monetary Fund
INR	Indian Rupee
IOSCO	International Organization of Securities Commissions
IP	Internet Protocol
IPO	Initial Public Offering
IRB	Internal Ratings-Based
IRDA	Insurance Regulatory and Development Authority
IRF	Inter-Regulatory Forum
IRS	Interest Rate Swap
IT	Information Technology
JPoD	Joint Probability of Distress
KYC	Know Your Customer
LC	Letter of Credit
LCR	Liquidity Coverage Ratio
LEI	Legal Entity Identifier
LGD	Loss Given Default
LIC	Life Insurance Corporation
LTRO	Long Term Refinancing Operations
MCA	Ministry of Corporate Affairs
MIBOR	Mumbai Inter Bank Offer Rate
MMMF	Money Market Mutual Fund
MoU	Memorandum of Understanding
MSE	Medium and Small Enterprises
MTM	Mark to Market
NAV	Net Asset Value
NBFCs	Non-Banking Financial Companies
NBFCs-D	NBFC - Deposit taking
NBFC-ND-SI	NBFC - Non Deposit taking - Systemically Important
NDTL	Net Demand and Time Liabilities
NG-RTGS	Next Generation Real Time Gross Transfer
NHB	National Housing Bank
NII	Net Interest Income
NIM	Net Interest Margin
NPA	Non-Performing Advances
NPB	New Private Bank
NPL	Non Performing Loan
NPS	New Pension System
NRE	Non Resident External
NSCCL	National Securities Clearing Corporation Limited
NSE	National Stock Exchange
NSFR	Net Stable Funding Ratio
OIS	Overnight Index Swap
OMO	Open Market Operation
OOI	Other Operating Income
OPB	Old Private Bank
OSS	Off-Site Surveillance
OTC	Over The Counter
PAT	Profit After Tax
PCR	Provision Coverage Ratio
PD	Probability of Default
PFMI	Principles of Financial Market Infrastructure
PFRDA	Pension Fund Regulatory and Development Authority
PMI	Purchasing Managers Index
PMS	Portfolio Management Service
PoD	Probability of Distress
PSB	Public Sector Bank
PSS	Payment and Settlement System
PSUs	Public Sector Undertakings
QE	Quantitative Easing
QIS	Quantitative Impact Study
Q-o-Q	Quarter-over-Quarter

RBI	Reserve Bank of India
RE	Revised Estimate
RoA	Return on Assets
ROC	Regulatory Oversight Committee
RoE	Return on Equity
RWA	Risk Weighted Assets
SCBs	Scheduled Commercial Banks
SDD	Single Due Diligence
SEBI	Securities and Exchange Board of India
SEZ	Special Economic Zone
SGF	Settlement Guarantee Fund
SIDD	Separately Identifiable Department or Division
SIFIs	Systemically Important Financial Institutions
SLA	Service Level Agreement
SLCC	State level Coordination Committees
SLI	Systemic Liquidity Index
SLR	Statutory Liquidity Ratio
SRS	Systemic Risk Survey
SUCBs	Scheduled Urban Co-operative Banks
SWFs	Sovereign Wealth Funds
T-bills	Treasury-bills
TGF	Trade Guarantee Fund
TI	Toxicity Index
TLA	Total liquid Assets
TOI	Total Operating Income
TR	Trade Repository
UK	United Kingdom
UL	Unexpected Losses
ULIPs	Unit Linked Insurance Plans
UMP	Unconventional Monetary Policy
US	United States
USD	United States Dollar
VaR	Value at Risk
VI	Vulnerability Index
WEO	World Economic Outlook
WGMR	Working Group on Margining Requirements
WMS	Wealth Management Services
WPI	Wholesale Price Index
Y-o-Y	Year-over-Year

Overview

Introduction

The Financial Stability Report (FSR) for India is being published biannually in June and December for the last three years. The FSR includes the contributions from all the financial sector regulators and is currently being approved by the Sub–Committee of the Financial Stability and Development Council (FSDC).

Structure of FSR

The first chapter of the FSR discusses macro-financial risks in the global and domestic economies and markets, providing a backdrop in which the financial system has been functioning. The second chapter of the report focusses on the soundness and resilience of financial institutions and discusses, amongst other things, the interconnectedness of the financial system. It presents the results of various stress tests conducted for assessment of resilience of scheduled commercial banks, scheduled urban cooperative banks and non-banking finance companies, to different types of risks. The chapter also includes coverage on insurance and pension sectors, which are important segments of the financial services sector. The last chapter gives an assessment in the progress of implementation of post crisis reforms proposed by G20/ Financial Stability Board, with specific reference to Indian position, and also includes other regulatory issues of systemic importance. The findings of the Systemic Risk Survey are presented at Annex 1. Methodology underlying some of the analytics used in the report is given at Annex 2.

Macro financial Risks

Global Economy and Markets

The announcement by Federal Reserve of the phased withdrawal from the bond buying programme has signalled the inevitability of eventual exit from the unconventional monetary policies adopted by major central banks. The risks which have been building up over the last five years of excess liquidity in the global system are now surfacing. The markets, especially in emerging economies need to be prepared for spells of high volatility and uncertainty going ahead. Global growth remains tepid and multipaced. Asset bubbles in housing might have been building up in certain parts of the globe.

Domestic Economy and Markets

The macroeconomic risks to Indian economy have increased over the last six months, mainly on the dimensions of domestic growth, external sector and corporate sector performance. Domestic supply bottlenecks, policy uncertainty, consequential dampened investment sentiment and slackening external demand contributed significantly to the slowdown, though fall in inflation and significant fiscal correction have provided some relief.

Current account deficit and its non- disruptive financing have emerged as major challenges from the perspective of macroeconomic stability. Various measures taken to dampen import demand for gold are taking hold and policy efforts are currently on to attract more stable long term capital through foreign direct investment (FDI) route.

The performance of Indian corporate sector has been subdued and in the emerging scenario, their increased external borrowing and unhedged foreign exchange exposures may further increase their vulnerabilities. On the fiscal front, there has been some credible improvement, reflecting in upgrade of outlook on India to 'stable' by one of the major credit rating agencies.

Financial Institutions: Soundness and Resilience

Scheduled Commercial Banks

Risks to banking sector have increased since the publication of the last FSR in December 2012, mainly in terms of asset quality and profitability. The asset quality

continues to remain under intense focus and prudential measures have been taken to step up the provisions on restructured accounts. The FSR also analyses the improved performance on parameters of credit and deposit growth, asset quality etc during the last quarter of the financial year and finds significant 'seasonality' in these parameters. The contraction in export credit during recent quarters is attracting the attention of policy makers. The growth in credit to micro and small enterprises (MSE) sector needs to be sustained.

Interconnectedness in the financial and banking systems

The Banking Stability Measures, based on co-movements in equity prices of listed banks, have shown some improvement in distress dependencies between banks. The network of the Indian financial system shows that the asset management companies and insurance companies have a high degree of exposure to the banking system. The liquidity contagion analysis brings out the risks from interconnectedness entrenched in the structure of the financial system.

Stress Tests

Macro stress tests indicate that if the current macroeconomic conditions persist, the credit quality of commercial banks could deteriorate further. However, the comfortable position on the banks' capital adequacy front lends resilience as shown by the *top-down* stress testing exercises on various risks. The results of the *bottom-up* stress tests (sensitivity analysis) carried out by select banks, also testify to the general resilience of the banks to different kinds of shocks. This issue of FSR introduces the analysis of NPAs on the basis of Estimated Losses approach for assessment of provisioning and capital adequacy of banks. The results show that, while the present level of provisions is adequate, a gap may arise under severe stress scenario.

The stress tests on capital and liquidity aspects of the scheduled urban cooperative banks (SUCBs) reveal that the SUCBs may be impacted, under severe stress scenario. The stress tests on credit risks for NBFCs show that even under the severe stress scenario related to deterioration in asset quality, the capital adequacy ratios remain above the minimum required level.

Insurance and Pension Sectors

The new business premium of insurance sector continued to contract for the last two years. Single premium insurance policies account for a major part of the life insurance business, especially of the Life Insurance Corporation. New Pension System introduced by the Government of India with a view to develop the pension sector has shown significant growth in the subscriber base and corpus.

Financial Sector Regulation and Infrastructure

Implementation of reforms at global level

The uneven progress on implementation of agreed global reforms in various jurisdictions is accompanied by a concurrent rethinking on the architecture and desirable degree of financial regulation. While the needs of different financial systems are expected to be different in terms of regulatory emphasis, the trends towards home-bias in regulation may have consequences for functioning of international markets, with varied effects on different jurisdictions.

India's progress on reforms

India's progress on implementation of various globally agreed reforms is being monitored under the framework of FSDC, through its Sub Committee. Inter-agency implementation groups have been formed, with focus on specific areas of reforms.

Basel III

India's implementation plan for Basel III reforms is more stringent in terms of schedule as well as capital requirements, in keeping with the traditionally prudent approach and to make up for judgemental errors, if any, in computing the capital requirements. Indian banks are facing challenges in implementation of AMA approaches for computing capital charge for operational risks on issues related to internal governance, data availability

and modelling of operational loss data etc.

OTC Derivatives

The implementation of reforms in OTC derivative markets in India is being taken up in a phased manner, with standardisation of products and introduction of centralised clearing in more segments of OTC market. The US and European laws dealing with OTC derivatives reform have raised concerns over possibilities of extra territorial regulatory jurisdiction which may lead to regulatory clashes and disruptions in market activity.

Supervision of Financial Conglomerates

Significant steps towards strengthening of the supervision of big financial groups have been taken in India, in recent period. The financial sector regulators have formalised a mechanism for co-operation in supervision for financial conglomerates and an Inter Regulatory Forum (IRF) has been set up, under the FSDC Sub Committee. Bilateral Memoranda of Understanding (MoU) have also been been signed with overseas supervisory bodies for improved cross border banking supervision and cooperation. Supervisory Colleges have been established for two big Indian banks.

Regulation of Shadow Banking

Significant regulatory measures have been taken to address the possibilities of liquidity risks emanating from money market and liquid mutual funds. The observed circularity in flow of funds between banks and mutual funds could lead to systemic risk in times of liquidity stress. The regulatory gaps observed in case of 'collective investment schemes' and some other methods through which various entities try to raise funds from public are being addressed through a coordinated approach, while seeking a more active role for the state governments and law enforcement agencies.

Consumer Protection

Instances of mis-selling of insurance policies, wealth management products and services and some other unhealthy practices at some banks have underscored the need for strengthening the consumer protection mechanism, adherence to KYC / AML guidelines and removal of certain distortions observed in the incentive framework.

The technology risks in times of increasing use of internet for various purposes, pose fresh challenges. The risks from obsolescence of existing technology platforms and outsourcing of business processes by banks need greater attention.

Financial Market Infrastructure

The financial market infrastructure, including the payment and settlement systems in the country has been functioning smoothly. There is a need for addressing the possible concentration risks from the exposure of the main two equity market clearing houses, to a common set of banks.

Systemic Risk Survey

According to the results of Reserve Bank's latest Systemic Risk Survey, conducted during April – May 2013, global risks and domestic macro-economic risks were perceived to be the two most important factors affecting the stability of Indian financial system. However, participants in the survey have expressed confidence in the stability of the Indian financial system.

Chapter I

Macro-Financial Risks

The gradual improvement in financial conditions that was setting in with the receding of tail risks in the global economy due to policy actions, has been interrupted by the recent turbulence in financial markets. Risk-off flights to safety triggered by apprehensions of global liquidity contracting with the Federal Reserve (Fed) indicating a phased withdrawal from its bond buying programme commencing later in 2013, has fuelled large scale sell off of financial assets in emerging markets leading to sharp downward movements in their equity, bond and currency markets. These developments have accentuated the spillover risks from unconventional monetary policies (UMPs) of advanced economy (AE) central banks posing new challenges to emerging economies.

On the domestic front, growth remains below trend and vulnerabilities on the external front have risen. The high current account deficit (CAD) and its financing remain stress points for the Indian economy as evident from the recent depreciation of the rupee on global cues. On the other hand, there are indications that inflation is moderating, the growth slowdown appears to be at a trough and measures taken to dampen import demand for gold are taking hold. Credible progress has been made on the fiscal front, which has been reflected in the upgrading of the outlook by credit rating agencies. Going forward, improvement in the quality of fiscal consolidation will be crucial for ensuring macroeconomic stability and sustainable higher growth.

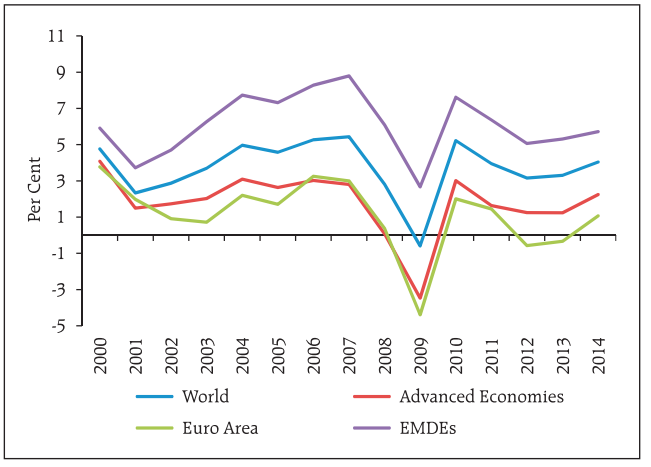
Foreign institutional investors (FIIs) were net purchasers in the equity and debt markets until recently and have turned net sellers in June 2013. Resources raised from the equity market have remained low and activity in the private placement market for debt has witnessed an increase. Domestic saving as a percentage of GDP, although high, has fallen and this could further curtail the availability of investible resources. Corporates remain stressed as reflected from the lower growth in sales and profits. Given the weakness of the rupee in recent times, unhedged-exposures may further increase the vulnerabilities of the corporate sector.

Global

Growth

1.1 Policy actions in stressed advanced economies have reduced tail risks globally, although fiscal drag in the US, austerity fatigue and incomplete financial repair in the Euro Area, low credibility of the proposed structural reforms in Japan and subdued growth in major emerging economies continue to pose downside risks to a return to resilient and sustained recovery. Global growth remains sluggish, multi-paced and subdued (Chart 1.1). In view of the lack of fiscal space and slow traction associated with structural reforms, monetary policies remain the first line of defense in the onerous job of stabilising economies.

Chart 1.1: GDP Growth and Forecasts



Source: WEO, IMF

1.2 In the US, firm indications of the recovery taking hold are evident in the Fed's policy announcement made on June 19, 2013 of gradual withdrawal from asset purchases commencing by the

end of 2013. Growth in the US improved during Q1 2013 and the Fed expects growth to be between 2.3 per cent and 2.6 per cent in 2013. Though unemployment has fallen to around 7.6 per cent, it remains above the Fed's comfort level. Growth, on the whole, in the US is expected to remain vulnerable to the adverse impact of the budget sequestration which could gradually gain pace in the months ahead. Future growth prospects in the US and global financial stability hinge around a credible resolution of the US debt ceiling debate.[1]

1.3 GDP growth in the Euro Area continues to remain in contraction mode. Among the larger Euro Area economies Germany, France, Spain, Italy and Netherlands witnessed negative y-o-y growth in GDP during Q1 2013. Credit growth to the private sector is still shrinking. Banks are reportedly repaying funds borrowed under the Long Term Refinancing Operations (LTRO). Unemployment has been increasing and it is currently high at 12.2 per cent. Youth unemployment at almost 24 per cent is a significant risk to socio-economic stability.

1.4 Growth in the UK has been low but positive for the last three quarters and is expected to be moderate in the near term. Higher consumer spending spurred by positive wealth effects brought about by unprecedented policy action has boosted Japan's growth to an annualised 3.5 per cent during Q1 2013, though structural issues remain a concern. Economic growth in China has been lower than anticipated during Q1 2013 raising apprehensions that economic activity could slow down further. In addition, financial stability concerns have emerged over the rapid increase in domestic credit in China. The other BRICS countries are also experiencing low growth.

Unconventional Monetary Policies - Exit

1.5 UMPs in advanced economies were undertaken to restore normal functioning of financial market and to reduce the domino effects emanating from the global financial crisis. What started as a response of monetary policy to address the liquidity induced solvency issues in the financial system had been persisted with to counter recession and boost economic growth. This reduced immediate tail risks, though continuance of such monetary policy over a prolonged period may have led build up of risks (Box 1.1).

1.6 The market reaction to the recent Fed announcement could be indicative of the risks to the markets in the medium term as different central banks eventually wind up accommodative monetary policies. The inevitability of exit has shaken up markets which were lulled into comfort by the ample liquidity available in the system. Such bouts of volatility may recur frequently as tightening gets phased out over the next few years. The fragile confidence of the markets is also evidenced by the strength of the market reaction. The emerging economies have been highly affected as capital flows have reversed impacting their currencies as also equity and bond markets. In general, risks from UMP exit stem from, among other things, timing, sequencing, and speed of exit. An added challenge is managing expectations in the face of differential economic conditions between and within geographies.

1.7 Bond yields in advanced economies and Euro Area periphery have increased sharply after the Fed's June 19, 2013 announcement. The persistence of this trend could jeopardise the progress made by stressed Euro Area countries and credit growth to the private sector could also fall further as liquidity recedes.

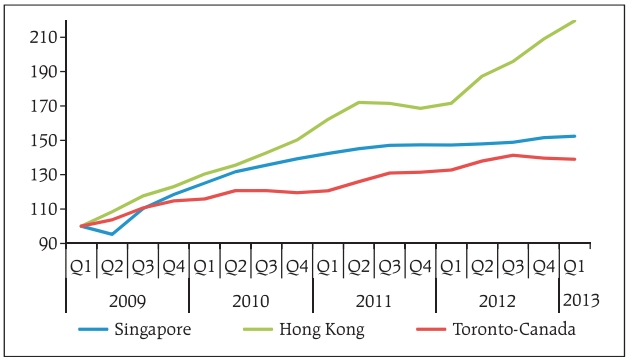
1.8 Risks from UMP exit are elevated even in the US as increasing yields could increase the cost of funds and threaten recovery. Even though communication from the Fed stated clearly that withdrawal from bond purchases was not pre-determined and would depend upon incoming data and evolving outlook, the markets appear to have interpreted it to mean an imminent

[1] There was a credit rating downgrade of the US after the brinksmanship witnessed during the debt ceiling debate in 2011.

Box 1.1: Unconventional Monetary Policies - Risks

Asset Price Bubbles : Low interest rates may have pushed investors into riskier activities in search of yield building up asset prices and encouraged corporates to build excess leverage. House prices in some countries have already witnessed sharp increases in the last few years and the fears of a housing bubble have re-emerged. Rapid asset price inflation, particularly in the housing market, can lead to problems for financial stability as witnessed during the sub-prime crisis in the US. While house prices have fallen in the US after the crisis and are currently below the pre-crisis levels, they have increased elsewhere (Chart 1) due to, among other reasons, search for yield and increase in credit.

Chart 1: House Price Indices (Q1 2009 = 100)



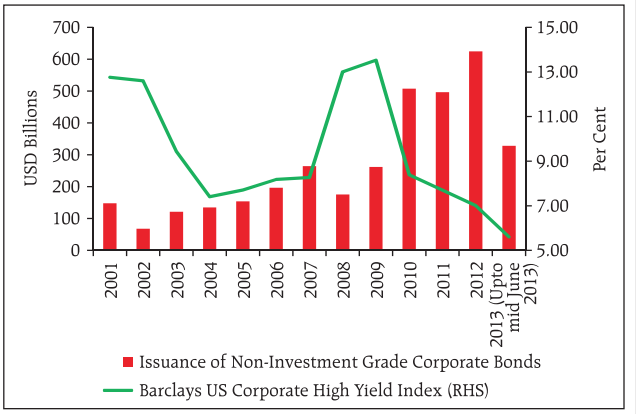
Source: Bloomberg, Teranet and National Bank of Canada, Govt. of the Hong Kong Special Administrative Region

Singapore, Canada and Hong Kong have taken measures to reduce inflation in house prices. Measures include reduction in the loan to value ratio, capping gross debt service ratio, reducing loan to value for mortgage refinancing, reducing the amortisation period, tightening of mortgage underwriting rules, removal of interest absorption schemes and transaction taxes for multiple houses.

Adverse Selection: The issuances of non-investment grade corporate bonds in the US have seen a significant increase in the recent past (Chart 2). Low interest rates could have influenced non price factors such as credit standard and quality of credit appraisal. The demand for non-investment grade corporate bonds is evident from their downward trending yields (Chart 2).

Reduced Incentive to Repair Balance-sheets: Extended period of low interest rates could reduce the incentive for

Chart 2: Non-Investment Grade Corporate Bonds in the US - Issuances and Yield



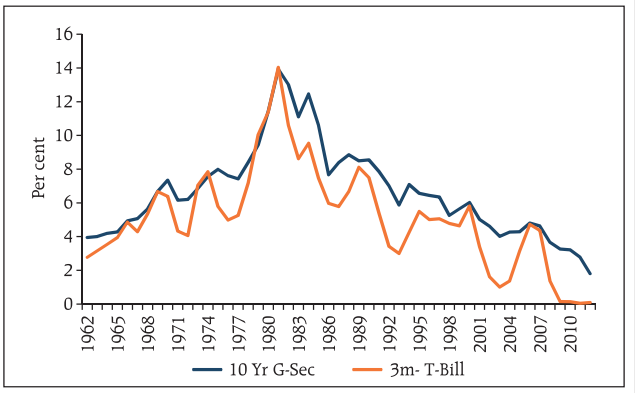
Source: Bloomberg

corporates and sovereigns to undertake the necessary balance-sheet repairs. Macroeconomic policy, at the current juncture, is faced with the challenge of ensuring short term survival without compromising on long term sustainability.

Market Distortions and Mispricing of Risk: Sovereign bond yields have been kept artificially low and since sovereign bonds act as pricing benchmark for many financial products there could be under-pricing of risks in those markets. The ability of markets to price risks can fall and markets may find it difficult to function when unconventional policies are eventually withdrawn.

Building up of Risks: Low interest rates in the period just after the dot com bubble bust are believed to have led to excesses in financial markets which eventually fuelled the global financial crisis (Chart 3). There is, thus, a possibility that the current extended period of low interest rates may once again have led to a build-up of similar risks.

Chart 3: Yield on US Government Securities



Source: Federal Reserve

withdrawal of bond purchases. The gap between what was stated by policy makers and how that is interpreted by markets may lead to heightened volatility in the global financial markets.

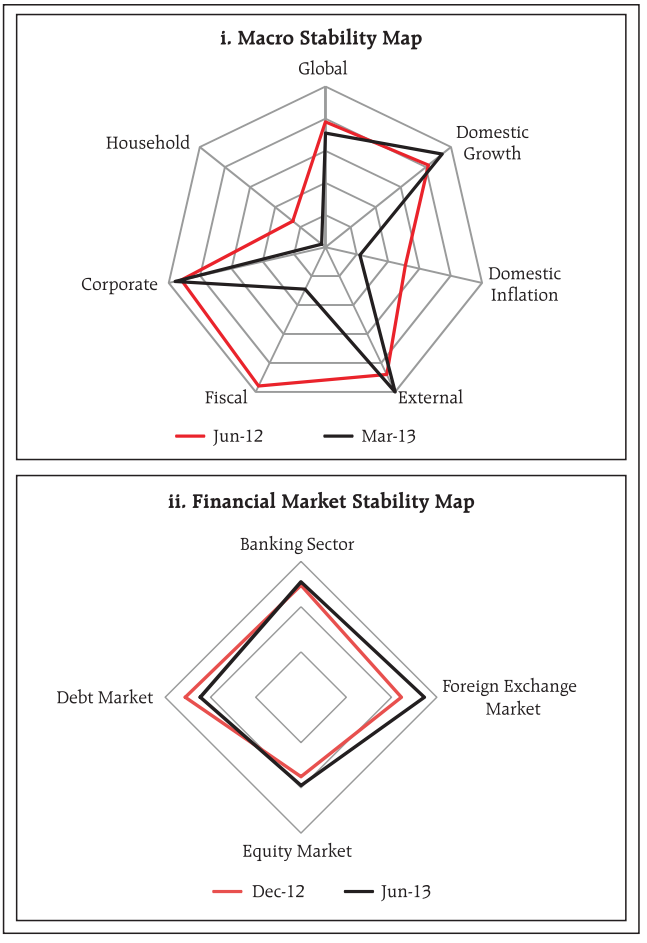
1.9 Uncertainty about the nature and timing of the exit is the dominant factor that is causing instability in financial markets. Increasing interest rates before reducing the size of the bloated central bank balance-sheets could inflict capital losses on central banks and holders of fixed income assets. Reducing balance-sheet size could impair the market for assets sold by central banks. Another issue with the eventual exit is that it is difficult to isolate the impact of individual polices on observed outcomes such as improvement in growth. Hence, it may not be possible to know which policy worked and which did not, or whether the synergies between policies worked or not. In this context, pulling the wrong policy lever could jeopardise growth and stability.

1.10 Lack of coordination among central banks in exiting from UMPs could increase the spillovers from such exits as capital flows could be de-stabilising. While it may be desirable to coordinate policy actions, it may not be possible to do so given the multi-paced nature of global growth.

Domestic

1.11 Overall macroeconomic risks facing the Indian economy appear to have increased since the publication of the previous Financial Stability Report (FSR) in December 2012 (Chart 1.2i). Domestic growth risks, external risks, and corporate vulnerabilities have increased, while, risks from global growth, domestic inflation, fiscal stance and households have receded. Based on the Financial Market Stability Map[2], risks seem to have increased in the Indian foreign exchange market, equity markets and banking sector while it has receded in the debt market (Chart 1.2ii).

Chart 1.2: Macro and Financial Markets Stability Map



Note: Data for External, Corporate and Household dimensions pertain to December 2012. Data for the Financial Markets Stability Map are as on June 20, 2013. Movement away from the center depicts increasing risk.

Source: RBI Staff Calculation

[2] For the methodology refer to Annex-2

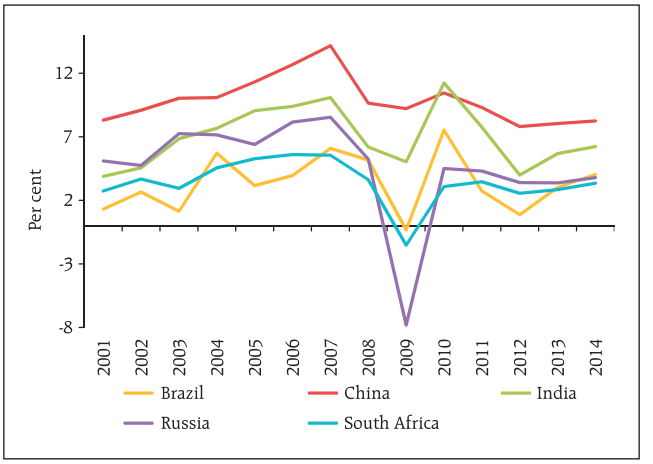
Growth

1.12 Against the backdrop of subdued below trend global growth and an uncertain global environment, the Indian economy is faced with several challenges, both internal and external. During Q3 2012-13, growth in the Indian economy slowed to a fifteen quarter low of 4.7 per cent. Though growth improved marginally to 4.8 per cent during Q4 2012-13, it touched a 10 year low of 5 per cent for the year 2012-13. Domestic supply bottlenecks, policy uncertainty, consequential dampened investment sentiment and slackening external demand contributed significantly to the slowdown though fall in inflation has provided some relief. Going forward, growth has been projected to be relatively higher at 5.7 per cent during 2013-14 by the Reserve Bank of India. India is, however, expected to grow faster than the other BRICS nations excluding China (Chart 1.3). It is also reassuring that some rating agencies have recently revised India's rating outlook to stable given the recent policy initiatives aimed at improving investment sentiment and growth.[3]

CAD and External Sector Vulnerability

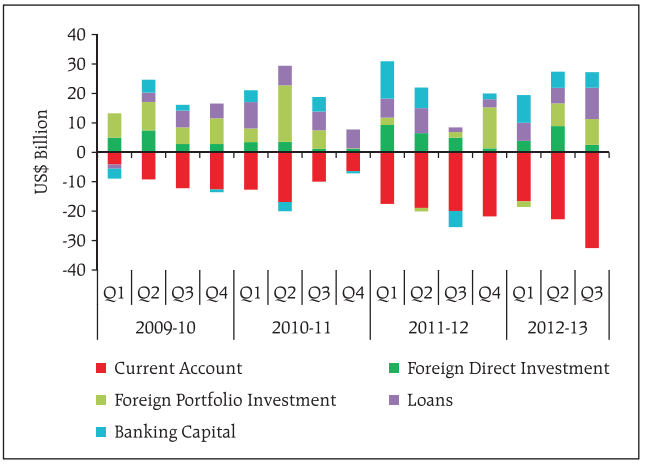
1.13 Non-disruptive financing of the high CAD and containing its size within sustainable levels has become the key challenge in managing the external sector and especially in mitigating its vulnerability to global shocks. In addition to the magnitude of flows needed to finance the CAD, the composition of flows, particularly dependence on portfolio and short-term debt flows represent an added source of concern (Chart 1.4). While lower commodity prices and moderation in gold imports could have a positive effect on the current account balance, high CAD in a sluggish economy poses difficult macroeconomic policy challenges.

Chart 1.3: Growth Forecasts for the BRICS Nations



Source: WEO, IMF

Chart 1.4: Sources of Financing India's CAD



Source: RBI

[3] Initiatives have been taken for operationalisation of 215 stalled projects involving about ₹7 trillion and implementation of projects on fast track through the Cabinet Committee on Investments has also been undertaken.

1.14 Rise in India's overall external debt is an added source of concern. Short term liabilities have also been increasing. The ratio of short term debt to total debt (both residual and original maturity) increased in Q2 and Q3 of 2012-13 from its level in Q1. Reflecting the widening CAD, net IIP-GDP ratio increased to 15.4 per cent at end-December 2012 from 15.1 per cent at end-September 2012. In general, the external sector vulnerability indicators have shown a worsening trend (Table 1.1).

1.15 A number of policy measures have been taken in the recent past to boost investor sentiment and augment capital inflows. Some of the measures are further liberalisation of the FDI policy[4], rationalisation of FII debt limit allocation norms, integration and simplification of FII investments in Indian debt securities, allowing long term investors like sovereign wealth funds (SWFs), multilateral agencies, endowment funds, insurance funds, pension funds and foreign central banks to invest in government securities within the overall limit, increasing the limits for FII investment in government securities and corporate bonds, deregulating the interest rates on NRE deposits, increasing the ceiling of the FCNR(B) deposits, and increasing the all-in-cost ceiling for external commercial borrowings (ECB). Apart from these measures the government is also envisaging a review of the extant FDI policy to tap the immense potential for FDI. A number of announcements have been made by the government to boost exports and revive investors' interests in Special Economic Zones (SEZs) in the Annual Supplement 2013-14 of the Foreign Trade policy 2009-14 released in April, 2013.

1.16 Rising gold imports have been a continuing concern (Chart 1.5). The share of gold in total imports has been increasing since 2007-08 and was close to 3 per cent of GDP in 2012-13.[5]

1.17 Several policy measures aimed at reducing vulnerabilities arising from gold imports have been taken. Import duty on gold has been raised. Banks and NBFCs have been advised not to lend for the purchase of gold in any form. Banks have also been advised not to lend against gold coins weighing more than 50 grams. Import of gold on consignment basis has been restricted for domestic use of gold. Further, all Letters of Credit (LC) to be opened by Nominated Banks / Agencies for import of gold under all categories has been allowed only on 100 per cent cash margin basis. In addition, all imports of gold will now necessarily have to be on documents against payment (DP) basis.

Table 1.1: External Sector Vulnerability Indicators

(Per Cent)

Indicator	End-Mar 2011	End-Mar 2012	End-June 2012	End-Sep 2012	End-Dec 2012
1. Ratio of Total Debt to GDP*	17.5	19.7	19.7	19.3	20.6
2. Ratio of Short-term to Total Debt (Original Maturity)	21.2	22.6	23	23.2	24.4
3. Ratio of Short-term to Total Debt (Residual Maturity)#	42.2	42.6	42.9	43.7	44.1
4. Ratio of Short-term Debt to Reserves+	21.3	26.6	27.8	28.7	31.1
5. Reserves Cover of Imports (in months)	9.6	7.1	7	7.2	7.1
6. External Debt (US$ billions)	305.9	345.5	349.1	365.6	376.3
7. Net International Investment Position (IIP)	-209.8	-248.5	-224.1	-271.5	-282
8. IIP/GDP ratio	-12.3	-13.3	-12.2	-15.1	-15.4

*: Annualised GDP at current market prices; #: RBI Estimate; +:Original Maturity

[4] FDI policy has been liberalised further and 100 per cent FDI in single-brand retail, 51 per cent FDI in multi-brand retail and 49 per cent FDI in registered aviation company and power exchanges have been allowed.

[5] Provisional Data for 2012-13

1.18 The rupee which was largely range bound during January – April 2013, started weakening in May 2013. Among other factors, strengthening US dollar and relatively high trade deficit during April-May 2013 exerted pressures on the Indian rupee.

1.19 Viewed from a different perspective, against the backdrop of tepid global growth, other emerging economies are also experiencing similar external sector challenges, in terms of both size of the CAD and pressure on the exchange rate (Chart 1.6).

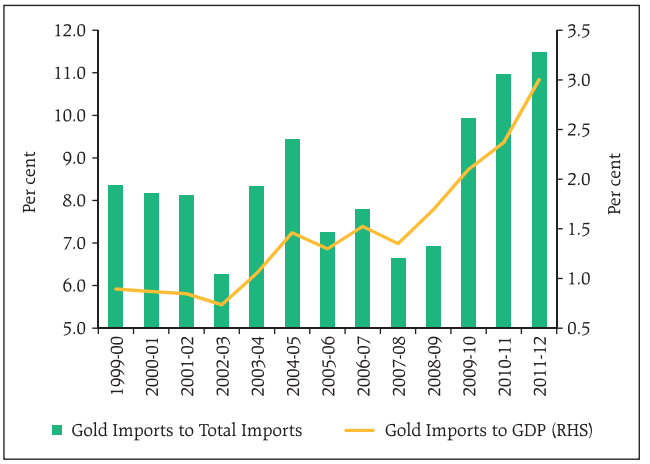
Fiscal Consolidation

1.20 High fiscal deficit has been a concern for India. In the post crisis period even the advanced economies have been pushed to relax their fiscal policies to support growth. In the annual budget for 2013-14 the Indian government has reiterated its commitment to fiscal consolidation and accordingly, the gross fiscal deficit (GFD) as percentage of GDP has been pegged at 4.8 per cent for 2013-14, and the same has been projected to come down to 3.0 per cent by 2016-17. During 2012-13, the fiscal deficit has been estimated to have come down to 4.9 per cent of GDP from the earlier estimate of 5.2 per cent.

The Government Borrowing Programme – Impact on Yields

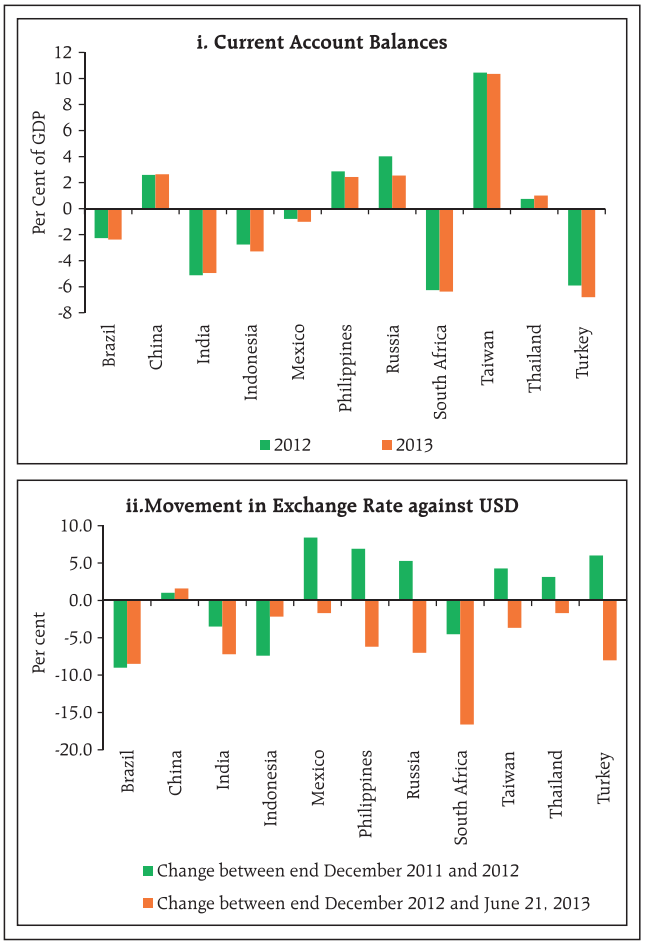
1.21 The likely impact on yields and cost of borrowings depends upon the size of the total borrowing requirements, which includes refinancing of the maturing debt amidst other things, such as credit demand from the non-government sector and interest rate cycle. Government's net market borrowing has been pegged at about ₹5.04 trillion for 2013-14, lower than the same at ₹5.13 trillion in 2012-13(RE). At the same time, the trajectory of projected gross fiscal deficit (GFD) given in the statement on "Fiscal Roadmap and Consolidation" made by Finance Minister in October 2012 indicates that the net market borrowing requirement may come down in the coming few years. The benefits of lower net borrowings,

Chart 1.5: India's Gold Import



Source: RBI

Chart 1.6: Current Account Balances and Exchange Rate Movements



Note: Current account balance data for 2013 is an IMF estimate. In Chart 1.6ii +ve change indicates appreciation and -ve change depicts depreciation

Source: IMF and Bloomberg

however, are likely to be negated by the higher refinancing needs given the sharp rise in the redemption pressures over the next few years (Chart 1.7). The buyback/ switches of government securities (G-Sec) will be used to reduce the redemption pressure and minimise the rollover risk over short-to-medium term. Union Budget 2013-14 has already announced such a programme for ₹500 billion during the current fiscal year.

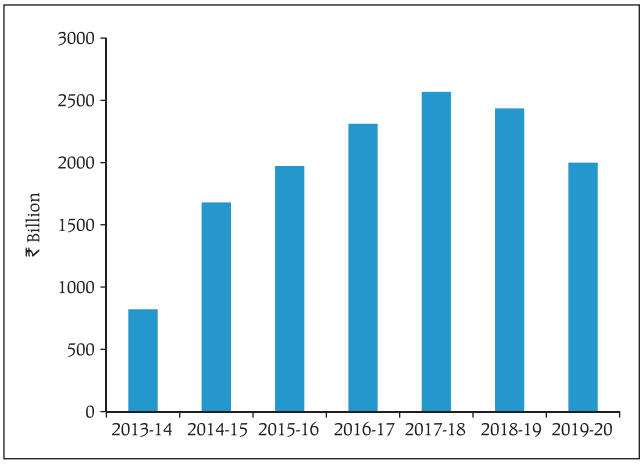
1.22 The meticulous debt management strategy of the past reduced the refinancing risk and the risks of a confidence crisis significantly by increasing the average time to maturity (ATM) of the outstanding portfolio of G-Secs, although the strategy could have imposed a trade off of higher duration risks on the investors. In terms of debt/GDP ratio, India's position is relatively better, but sustainable level of sovereign debt is a country specific issue, and depends, among other things, on tax to GDP ratio. (Chart 1.8).

Equity Markets

1.23 Equity markets in India had generally witnessed an upward trend since mid 2012 on the back of FII support *albeit* some intermittent correction. The recent announcement on the tapering/withdrawal of bond purchase in the US had led to volatility in global equity markets including the Indian equity market. FIIs which were net purchasers have turned net sellers in June (up to June 20, 2013) and there is a risk that the capital flows could reverse on a large scale if the risk off sentiment intensifies causing increased volatility in the Indian markets. The markets have been exhibiting knee-jerk reactions to any news about possible exit from unconventional monetary policy.

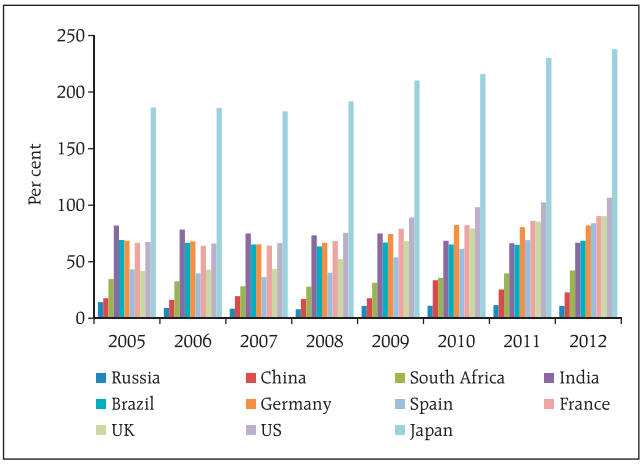
1.24 Even though the secondary markets have witnessed strong performance until recently, there has been no concomitant improvement in the primary equity markets. The performance of the BSE IPO index has been relatively weaker compared to the BSE Sensex (Chart 1.9).

Chart 1.7: GOI Market Borrowing Programme: Redemptions



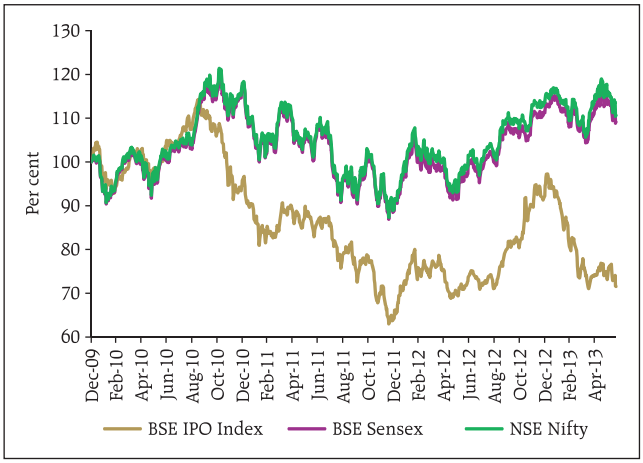
Source: RBI

Chart 1.8: Debt to GDP Ratio



Source: WEO, IMF

Chart 1.9: BSE IPO Index, BSE Sensex and NSE Nifty
(End December 2009 = 100)



Source: BSE and Bloomberg

Table 1.2: Resource Mobilisation in the Equity Market : Public and Rights Issues

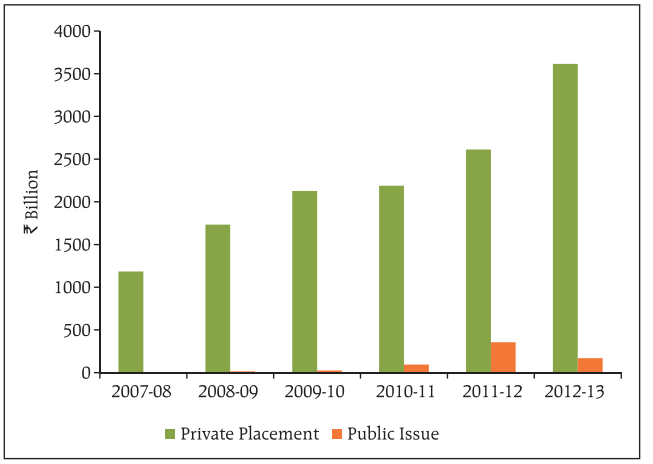
Type of issue	2009-10		2010 - 11		2011 -12		2012- 13	
	No. of issues	Amt. (₹ Billion)	No. of issues	Amt. (₹ Billion)	No. of issues	Amt. (₹ Billion)	No. of issues	Amt. (₹ Billion)
Public	44	467.4	58	486.5	35	104.8	33	65.3
Rights	29	83.2	23	95.0	16	23.8	16	89.4
Total	73	550.6	81	581.6	51	128.6	49	154.7

Source: SEBI

1.25 Weak macro-economic performance and subdued investment climate reduced the incentives for the corporate sector to raise resources *via* the equity market (Table 1.2).

1.26 As a result, the resource mobilisation activity has increased in the private placement market for corporate bonds (Chart 1.10) even as debates continue over the under-developed corporate debt markets (Box 1.2)

Chart 1.10: Resource Mobilisation *via* Corporate Bonds



Source: SEBI

Box 1.2: Corporate Bond Markets in India: Some Persisting Issues

There has been a lot of debate over the last two decades, more intense in the recent past, about the need for the existence of and developing a vibrant corporate bond market in India. While significant efforts have gone into the development of corporate bond markets in India, substantial progress has not been made yet. The fundamental question that, hence, emerges is that whether the markets for specific products evolve or that they need to be developed. One way of tackling such a dilemma is to generally let the markets evolve unless the economic costs are more than the socio-economic benefits of having markets for such products.

When the erstwhile long term financing institutions were either allowed to morph into full-fledged commercial banks or become defunct with regard to supply of long term financing, it was possibly believed that banks in turn would take the role of providing such long term resources to companies and projects, despite the fact that banks were expected to go through stringent asset liability matching norms. Later when the government undertook fiscal reforms and India's new growth trajectory required massive investments in infrastructure (including power) for its sustenance, the need for providers of long term finance has once again been felt. It is interesting to note that elsewhere massive public works have been financed seamlessly by the governments (*e.g.* Japan and China) and not through bond markets.

In India, banks predominantly provide for funding requirements and the debt market has catered mainly to the government. Banks hold government bonds in their portfolio because of statutory requirement and also due to sovereign status of bonds. While banks have been meeting the needs of financing infrastructure (including power) currently, there may be some further constraints on such long term financing once the Basel III bank liquidity norms such as the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) are implemented. Which in turn means that in the absence of alternative arrangements (such as securitisation, take out finance

(Contd....)

(...Concld.)

etc.,), banks may not be in a position to undertake long term project financing.

There are concerns over the provision of credit enhancements/guarantee by banks to corporate bond issuances which has been suggested as one measure to aid the development of bond markets in India. Credit enhancements will hamper the development of a corporate bond market on corporates' own financial strength and could possibly distort the pricing mechanism. In addition, reliance on credit enhancements provided by banks will keep most of the risks in the banking system. Countries like China, Korea and Egypt attempted to develop corporate bonds markets by encouraging banks to offer bank guarantees, but couldn't achieve much success.

A recent RBI Committee has made recommendations to enable banks to tap the bond market and lend long term at fixed rates.[6] Banks are currently permitted to raise long term bonds with a minimum maturity of 5 years to the extent of their exposure to the infrastructure sector of residual maturity of more than 5 years. The committee was of the view that banks which have not issued long term bonds to the extent of their said exposure to the infrastructure sector could utilise the room available to issue more of long term bonds which would help release resources for extending long term fixed rate loan products. Another recommendation of the Committee was offering of fixed rate long term loan products with periodic interest reset provision (every 7-10 years) in addition to the plain vanilla fixed rate loan products for long tenor.

In this context it is interesting to look at how the financial markets are positioned in the US and the Euro Area (EA) in terms of bank financing and bond financing and why the practices differ widely. It has been argued that corporate finance practices are largely explained by the extant legal and institutional settings (La Porta *et al.* 1997) and that countries like US and UK which practice the common law where more protection is offered to shareholders and creditors have seen better and faster growth of capital markets than civil law countries such as France and Germany.

In other words, other things remaining same, the level of legal protection to creditors is a dominant factor in deciding the dominance of dis-intermediated markets over the intermediated markets. Thus we can see dominant securities markets in the US, where more than 80 per cent of the funding comes from outside the banking sector, and a dominant bank credit market in the EA. Others have argued that the legal protection regime alone does not explain the different practices in the US and the Euro Area (EA) and that the EA position has been explained by the relatively lower availability of public information about firms' creditworthiness and higher need for the flexibility and information acquisition role offered by the banks (Fiorella De Fiore and Harald Uhlig, 2011).

There is also a major difference between the equity and debt issuances by various entities. While reissue of equity generally is done in a way that the reissued equity is fungible with the original, in the case of bonds, since the issuance depends upon the needs of the issuer, prevailing interest rates *etc.*, it is quite difficult to develop an identical class of bonds that can have similar trading liquidity as the bonds being reissued. In this context it may be interesting to see the emerging interest in corporate bonds in Europe which is developing because the borrowers for, obvious reasons are, replacing bank loans with bonds. With new Basel liquidity norms then, do we see a collateral benefit to the financial system *i.e.*, the evolution of more vibrant bond markets? Or with the implementation of these new norms taking quite some time, is there a need to rebuild the structure similar to the erstwhile Developmental Financial Institutions in a big way to take care of the long term financing needs?

References

De Fiore, F. and H. Uhlig (2011), "Bank Finance versus Bond Finance", *Journal of Money, Credit and Banking*, 43 (7), pp. 1395-1418

La Porta, Rafael, F.L.De Silanes, A. Shleifer and R.W.Vishny (1997), "Legal Determinants of External Finance, *National Bureau of Economic Research,* WP - 5879

[6] Report of the Committee to Assess the Feasibility of Introducing more Long Term Fixed Rate Loan Products by Banks, 2013

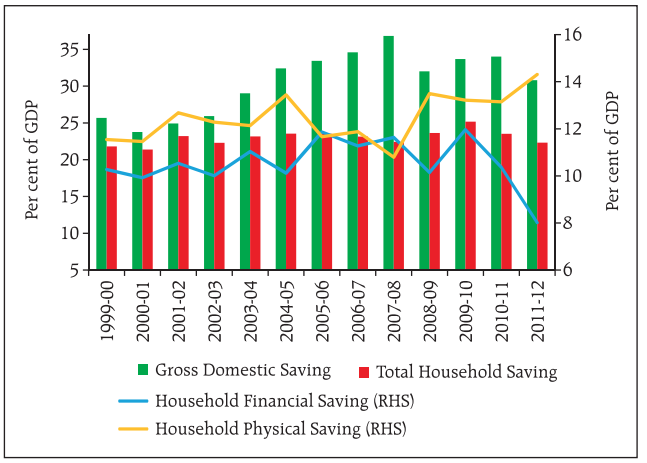
Saving in the Economy

1.27 Gross Domestic Saving as a proportion to GDP has fallen from 36.8 per cent in 2007-08 to 30.8 per cent in 2011-12 (Chart 1.11). A large part of this decline has been due to fall in financial savings of households which have declined from 11.6 per cent of GDP to 8 per cent of GDP over the corresponding period. Of late, the shift from financial assets to real estate and gold has become stark. Inflation, low penetration of banking services across the country, credibility of the financial institutions in the wake of mis-selling of products and financial frauds, low post tax return on bank deposits, negative/low real interest rates *etc.* could be some of the issues that need to be addressed to redirect non-financial savings towards financial savings. The government has been taking steps to increase the financial savings in the country; one such step is the issuance of inflation indexed bonds (IIBs).

Housing Market

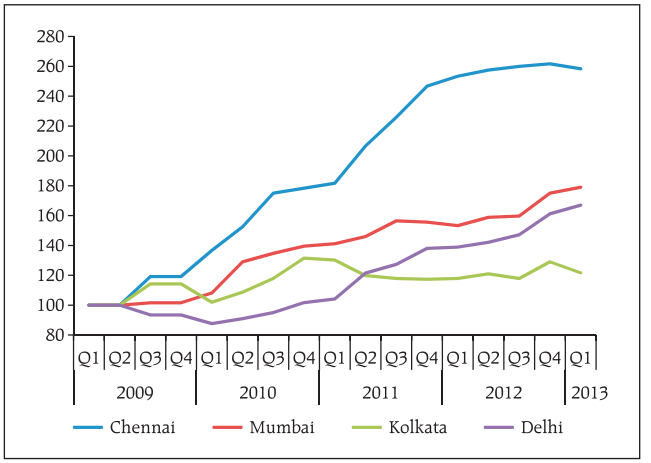
1.28 Housing is a high value decision for most households in an emerging market economy. The housing sector is said to have linkages with about 250 sub-sectors in the Indian economy. Given the importance of the housing sector in the Indian economy, monitoring of this sector is necessary. House prices in some Indian metropolitan cities have witnessed significant increases in the recent past (Chart 1.12). Growth of bank credit to this sector has, however, been moderate[7] (Chart 1.13). Further, the share of credit to the housing sector fell to 9.5 per cent as at end March 2013 from 13.3 per cent at end April 2007 (Chart 1.14). NPAs in the home loan category have also fallen in the last three years. Some of the concerns, however, are complete up-fronting of construction finance by home buyers to developers in some cases and availability of construction finance to developers at rates on par with those for home buyers.

Chart 1.11: Saving in the Indian Economy



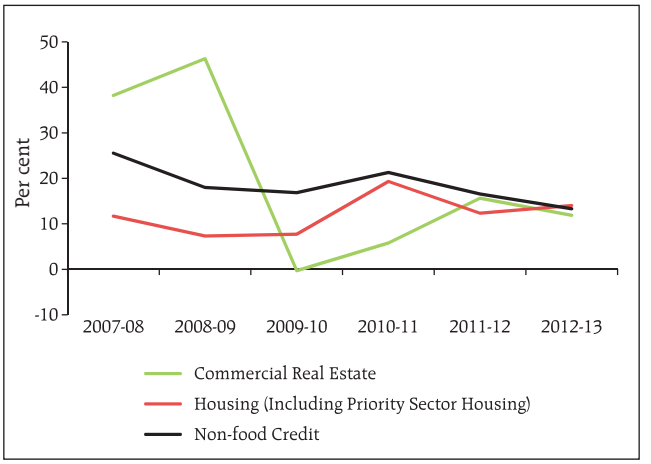
Source: RBI

Chart 1.12: House Price Indices: India
(2009 Q1 = 100)



Source: NHB

Chart 1.13: Growth in Bank Loans to the Housing Sector



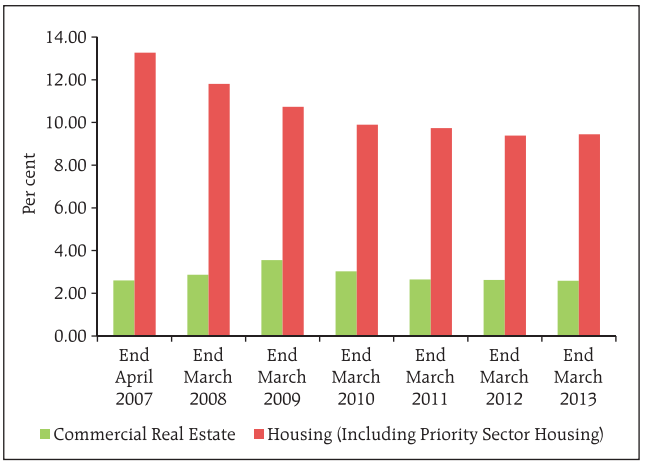
Source: RBI

[7] Data are provisional and relate to select 47 banks, which account for 95 per cent of total non-food credit extended by all scheduled commercial banks.

1.29 There is a need to closely monitor this sector since there are indications that price to annual rent ratios in some parts of metro-cities like Mumbai are as high as 50. In addition, there is also a need to develop indicators other than price and volume indices and credit to the housing sector to gauge the trends in and the overall health of the sector. Indicators such as house price to household disposable income ratio, household financial obligations to household disposable income ratio, land price indices, index of construction costs, and price to rent ratio, information on ownership of houses, among other indicators need to be developed. The demand-supply mismatches in various price segments could also provide useful policy inputs.

1.30 More transparency in real estate transactions gains importance both from the view of consumer protection and prevention of money laundering. A law to regulate the real estate sector in order to improve the information flow, transparency, protection to home owners and to aid healthy and orderly growth is on the anvil. The proposed National Housing Bank (Amendment) Bill, 2012, accords powers to register and regulate housing finance companies to the Reserve Bank of India.

Chart 1.14: Share of Credit to the Housing Sector in Non Food Credit



Source: RBI

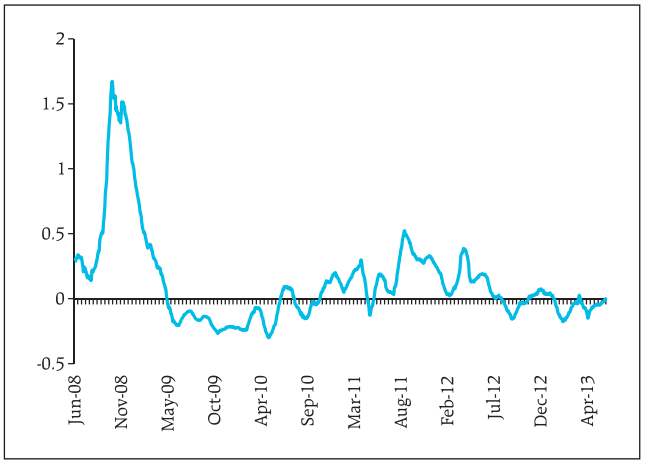
Liquidity: Banking and Systemic

1.31 Liquidity conditions in the banking system exhibited mixed trends during 2012-13 with alternating phases of comfortable liquidity and bouts of tightness. The liquidity situation eased at the beginning of the financial year 2012-13 but overall, the liquidity deficit in the banking system during the first quarter of 2012-13 remained above the indicative comfort zone of the Reserve Bank (*i.e.*, +/- 1 per cent of NDTL of the banking system). The situation, however, improved significantly in the second quarter of 2012-13, but came under significant stress during the third quarter, especially after mid-October 2012, on the back of persistently high government balances with the RBI coupled with rise in currency in circulation. The tight liquidity condition prompted the Reserve Bank to resume OMO purchase auctions

after a gap of over 5 months. Tight liquidity conditions continued in the fourth quarter of the year as well. On the whole, liquidity conditions in the banking system were much tighter in the second half of the year as compared to the first half. Despite tight liquidity conditions, government bond yields have come down significantly. During the current financial year, the banking system liquidity has generally improved from early June 2013 onwards.

1.32 However, the Systemic Liquidity Index (SLI), which is based on a multiple indicator approach that aims to capture the overall funding scenario in the financial system *viz.*, the banking, non-banking financial, the corporate sectors and liquidity in foreign exchange market, shows that the liquidity conditions improved during Q4 of 2012-13 (Chart 1.15).

Chart 1.15: Systemic Liquidity Indicator



Note: The SLI below zero denotes comfortable level of liquidity conditions in the system, whereas a level above zero implies tight liquidity conditions.

Source: RBI Staff Calculations

Corporate Performance

1.33 The corporate sector in India has come under stress in the recent past. Analysed on the basis of a few key variables such as Sales, Profit Margin [EBITDA (Earnings before Interest, Tax, Depreciation and Amortisation) to Sales], EBIT (Earnings before Interest, Tax), Interest Expenditure, Net Profits among other variables, the corporate sector shows increasing stress. In general, growth rate of sales and profits have fallen during Q3 2012-13 (Table 1.3).

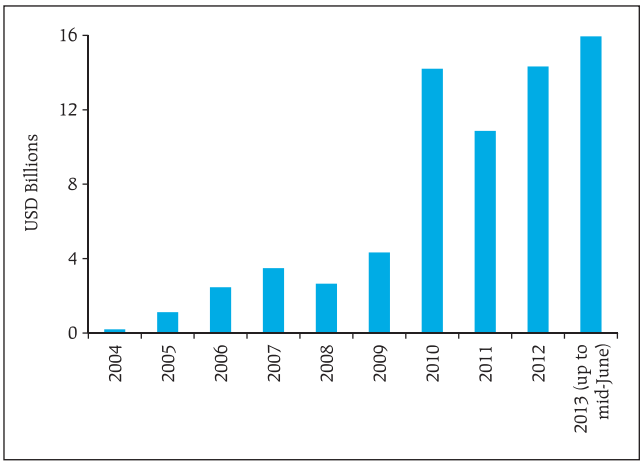
Table 1.3: Corporate Sector Performance

	Q3FY12	Q4FY12	Q1FY13	Q2FY13	Q3FY13
	Growth Rate (Y-o-Y) Percent*				
Sales	19.2	15.5	13.9	11.6	9.3
Operating Profits (EBITDA)	-4.8	-0.5	-3.5	11.3	7.8
Gross Profits (EBIT)	0.8	4.1	-2.6	18.9	5.5
Interest**	58.8	39.9	38.6	11.5	17.4
Net Profits	-28.8	-7	-11.1	23.8	23.6
	Ratios in Per Cent				
Interest Burden	30.2	27	33	27.6	33.6
EBITDA to Sales	12.8	13.3	12.9	13.2	12.6
EBIT to Sales	11.7	12.6	11.6	12.8	11.3
	Growth Rate (Q-o-Q) Percent#				
Sales	6.1	9.6	-4.7	0.7	3.9
Operating Profits (EBITDA)	2.4	13.7	-7.5	3.5	-0.9
Gross Profits (EBIT)	2.9	18.5	-12.3	11.1	-8.7
Interest**	5.6	5.9	7.3	-7	11.2
Net Profits	-15.1	51.2	-17.9	17.4	-15.3

Note: *: Refers to 2473 companies **: Some companies report interest on net basis # Common Companies
Source: RBI

1.34 Indian corporates have been increasingly accessing international debt markets to raise resources (Chart 1.16). While this is presumably in response to improvement in international financing conditions to take advantage of the low interest rates in the international markets, un-hedged exposures and an eventual increase in interest rates could put pressure on Indian corporates. Banks have already been advised to rigorously evaluate the risks arising out of un-hedged foreign currency exposure of their corporate clients and price them in the credit risk premium while extending fund based and non-fund based credit facilities to them as this has implications for the asset quality of banks and their profitability. Banks have also been advised to consider stipulating a limit on un-hedged position of corporates on the basis of bank's Board approved policy.

Chart 1.16: Bond Issuances by Indian Corporates Abroad



Source: Bloomberg

Chapter II

Financial Institutions: Soundness and Resilience

Risks to banking sector have increased since the publication of the last FSR in December 2012. The strain on asset quality continues, although it has shown some improvement during the quarter ended March 2013. The growth in credit and deposit, as well as changes in asset quality have shown significant 'seasonality'.

Various Banking Stability Measures, based on co-movements in banks' equity prices, indicate that the distress dependencies within the banking system which were rising during last year, have shown some sign of easing. The inter-bank market continues to be highly interconnected as brought out by the network analysis. A simulation of liquidity and solvency contagion reveals that the failure of a large bank can significantly impact the banking system. Macro stress tests indicate that if the current macroeconomic conditions persist, the credit quality of commercial banks could deteriorate further. However, the comfortable position on the banks' capital adequacy front has provided resilience as shown by the top-down stress testing exercises on various risks.

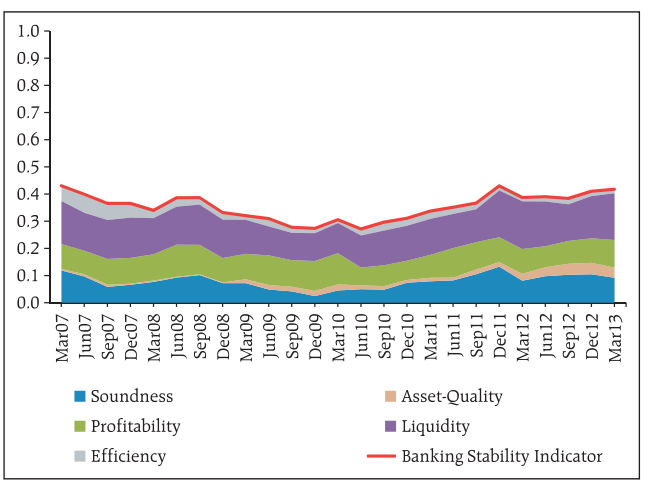
The results of the bottom up stress tests (sensitivity analysis) carried out by select banks, also testified to the general resilience of the banks to different kinds of shocks.

The new business premium of insurance sector continued to contract for the last two years. Single premium insurance policies account for a major part of the life insurance business especially of the Life Insurance Corporation. Persistency rates also continue to cause concern in life insurance business. New Pension System introduced by the Government of India with a view to develop the pension sector has shown steep growth in the subscriber base and corpus.

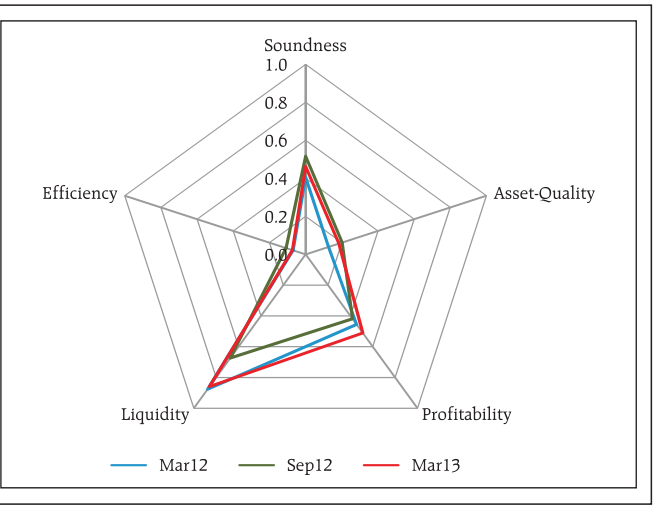
Assessment of Risks - Banking Sector

2.1 The risks to the banking sector, as at end March 2013 have increased marginally since the publication of previous FSR[1]. The Banking Stability Indicator, which combines the impact on all major risk dimensions, shows an increase in vulnerability in the banking sector since September 2010 (Chart 2.1). An analysis of the components contributing to banking stability shows that tight liquidity, deteriorating asset quality and reducing soundness are the major

Chart 2.1: Banking Stability Indicator and Map



Note: Increase in indicator value shows lower stability.
Source: RBI Supervisory Returns and Staff Calculations.



Note: Away from the centre signifies increase in risk.

[1] December 2012 - with reference to data as at end September 2012.

contributors to the decline in stability of the banking system. This comparative position is reflected in the Banking Stability Map also (Chart 2.1).

Distress Dependencies and Interconnectedness

Banking Stability Measures (BSMs) – Distress Dependency Analysis

2.2 The financial system is conceptualised as a portfolio of a specific group of banks[2], for the purpose of modelling distress dependencies, based on the premise that during times of distress, the financial position of banks tend to decline concurrently through direct and / or indirect links. These links mainly include mark-to-market asset values, interbank lending and information asymmetries.

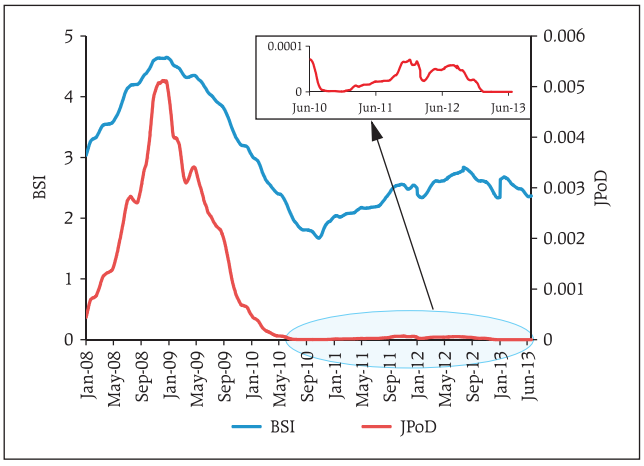
2.3 The Banking Stability Measures (BSMs), based on the distress dependency structure among banks, use the technique of Banking System's Portfolio Multivariate Density (BSMD)[3] (Segoviano and Goodhart, 2009). The BSMD technique takes into account inter-dependent structure of distress, which captures both linear and non-linear distress dependencies among the banks in the system and provides a set of tools to measure: (i) common distress of the banks in a system and (ii) distress between specific banks. The BSMD technique uses both the individual and joint asset value movements of the portfolio of banks and the BSMD is derived from Probabilities of Distress (PoDs)[4] of the banks, observed empirically, based on 99 per cent Value at Risk (VaR) of banks' daily equity price return.

2.4 The BSMs presented in this section comprise of the Banking Stability Index, Toxicity Index and Vulnerability Index. While the Banking Stability Index depicts the common distress of the banks in a system, the Toxicity and Vulnerability Indices depict the distress between specific banks.

Common distress in the system

2.5 The probability of distress of the entire banking system, as measured by Joint Probability of Distress (JPoD) has registered a marginal decline during last six months. Trends in the Banking Stability Index (BSI), that measures the expected number of banks that could become distressed given that at least one bank has become distressed, showed an upward trend (deteriorating conditions) from December 2010 till September 2012. A marginal decline in BSI registered since September 2012 indicating some sign of easing in interdependencies among banks, has again reversed in February 2013 (Chart 2.2). It may be observed the common distress in the system measured by JPoD and BSI is significantly lower at present, than the distress observed during the peak of the global financial crisis. The JPoD and the BSI not only take account of individual banks' probabilities

Chart 2.2: Movements of JPoD and BSI



Source: Bloomberg data and RBI Staff Calculations

[2] Study is based on15 major banks have been selected for which equity price data are available. These represent about 60 per cent of total assets of scheduled commercial banks in India.

[3] For details please refer to the Annex-2.

[4] The PoDs for banks were estimated from their equity return distributions. Under this approach, first, banks' historical distributions of equity returns are estimated. Then, the probability of returns falling under the historical worse 1 per cent of the cases (99 VaR) is quantified. Therefore, the PoD of a specific bank represents the probability that the bank's equity return would fall in the tail region (historical one percentile).

of distress, but these measures also embed banks' distress dependence. Therefore, these measures may experience larger and nonlinear increases than those experienced by the PoDs of individual banks.

Distress relationship among banks

2.6 The Toxicity Index (TI) is the average probability that a bank under distress may cause distress to another bank in the system, whereas, Vulnerability Index (VI) is the average probability of a bank coming under distress given distress in other banks in the system. Both the indices have shown a co-movement with that of BSI indicating signs of easing toxicity and vulnerability of the selected banks (Chart 2.3).

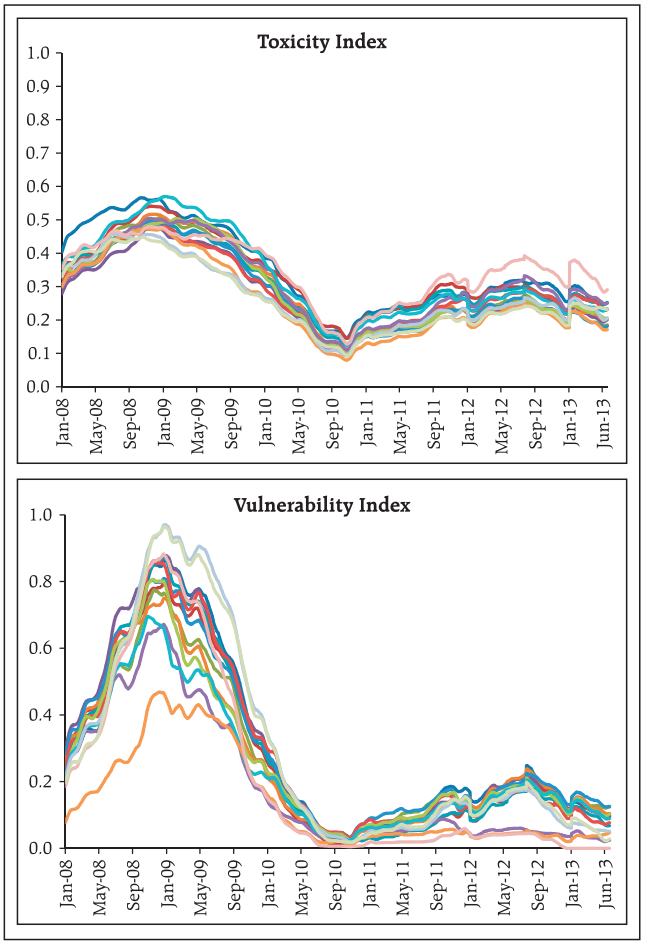
Network Analysis[5]

The interbank market

2.7 The Indian Financial System is bank dominated. The market for interbank exposures (exposures between SCBs), stood at ₹9.8 trillion as at end March 2013. The public sector banks with 62 per cent share of the market comprised the largest segment, followed by the foreign banks whose share of the market was around 28 per cent.

2.8 Average interbank lending as a percentage of total assets stood at around 11 per cent while inter bank borrowing as a percentage of total outside liabilities stood at around 13 per cent. However, the exposure was significantly higher for some banks, making them vulnerable to solvency and liquidity shocks arising out of any instability in the overall banking system (Charts 2.4 and 2.5).

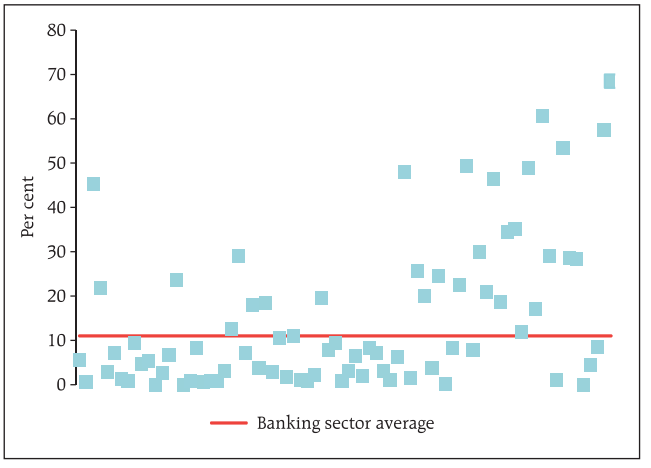
Chart 2.3: Distress between specific banks



Source: Bloomberg data and RBI Staff Calculations

Chart 2.4: Lending in the interbank market

(Per cent of total assets)



Source: RBI Staff Calculation

[5] The analysis of the financial system is based on a sample size of 165 institutions. This includes all the SCBs and select Insurance Companies, Asset Management Companies, Urban Cooperative Banks, NBFCs and specialized financial institutions. The Network model used in the analysis has been developed by Professor Sheri Markose (University of Essex) and Dr. Simone Giansante (Bath University) in collaboration with the Financial Stability Unit, Reserve Bank of India.

2.9 An analysis of the network of interbank call money market indicates a low level of tiering[6] compared to the network of interbank exposures. The size of the market amounted to ₹213 billion as at end March 2013 and its network structure effectively demonstrates only two tiers with the banks in the core being the major lenders in the system. The structure of the network in the call money market indicates that the failure of any of the lenders in the inner core will have significant implications for the liquidity of the market.

2.10 The network of the interbank Certificate of Deposit (CD) exposures displays a higher degree of interconnectedness as compared to the call money market, though the level of tiering is low in this market as well. The connectivity ratio[7] of the interbank CD market stood at 9 per cent, whereas the same ratio for the interbank call market was just above 1 per cent (Chart 2.6 and 2.7). These ratios are well below the connectivity ratio for the total interbank market which is around 25 per cent.

The Non-Banking Financial Sector

2.11 In the broader financial system, the main non-bank institutions are the Asset Management Companies and the Insurance Companies. The combined investment/lending by these two sectors amounts to over ₹6.5 trillion, most of which is to banks. The exposure of these entities to the banking system makes them potentially vulnerable to solvency shocks arising from any instability in the banking system.

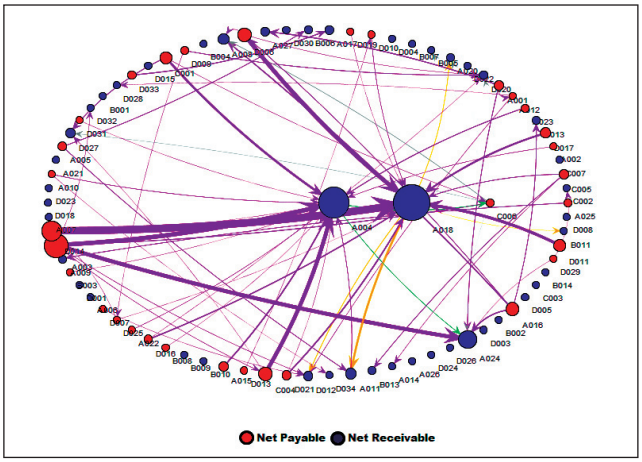
2.12 The business models of Non-Banking Financial Companies (NBFCs)[8] make them largely reliant on banks for their liquidity requirements. Within the financial system, they are the second largest borrowing sector, after the banking sector. Total borrowing by

Chart 2.5: Borrowing in the interbank market

(Per cent of total outside liabilities)

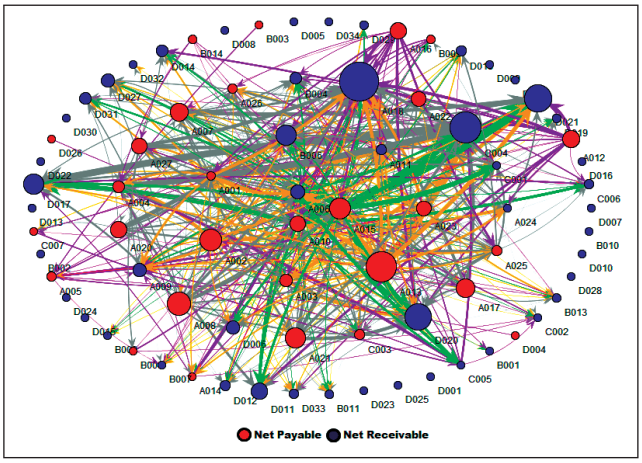
Source: RBI Staff Calculation

Chart 2.6: Network of the interbank call money market



Source: RBI Staff Calculation

Chart 2.7: Network of the interbank CD market



Source: RBI Staff Calculation

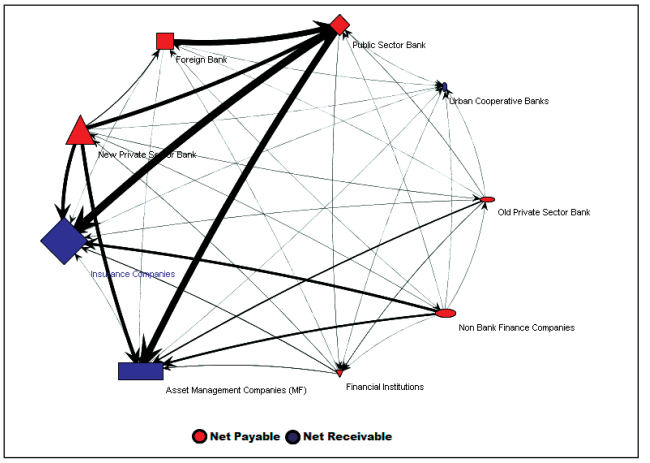
[6] For details on tiering and Network Structures, please refer to the Annex-2.

[7] Connectivity ratio is measured as the actual number of connections to all total possible connections in a network.

[8] Sample size includes 35 top (both deposit taking and non deposit taking) NBFCs in the country.

this sector is close to ₹3 trillion, while the investment/ lending by NBFCs stood at around ₹1.2 trillion. The bulk of these exposures are fund based. The reliance of the NBFCs to banks makes them vulnerable to liquidity shocks arising from any instability in the banking system (Chart 2.8).

Chart 2.8: Network of the Financial System



Source: RBI Staff Calculation

Contagion Analysis

2.13 Contagion analysis with network tools is used to assess distress in the banking system due to insolvency of the net borrowers. The exercise is a stress test which reckons the impact of failure of a net borrower in the system without taking cognizance of the probability of failure of a bank. It is important to note that the trigger for contagion is the failure of a major player, the probability of such failure being subject to macroeconomic factors and its own financial position. In the well regulated Indian banking system, the probability of such failure is a tail event, especially since the prudential regulator is also in charge of systemic risk.

2.14 The extent of contagion caused by distress in a bank will vary depending on the criteria that is used to determine the condition under which a bank is treated as 'distressed', with more stringent distress conditions leading to a more severe contagion results. This is illustrated in the table below which shows the contagion impact using different distress conditions (Table 2.1).

Table 2.1: Contagion due to one of the five largest borrower banks are under distress

Distress Criteria / Trigger Banks	Banks is under distress if leverage ratio falls below 3 per cent		Banks is under distress if it loses more than 25 per cent of its capital		Banks is under distress if core capital ratio falls below 6 per cent	
	No. of banks becoming distressed	Per cent of capital loss to the banking system	No. of banks becoming distressed	Per cent of capital loss to the banking system	No. of banks becoming distressed	Per cent of capital loss to the banking system
A	3	7.5	24	20.2	13	20.2
B	3	11.9	14	18.0	11	18.0
C	1	5.6	7	7.6	3	7.6
D	2	8.0	7	10.0	3	10.0
E	1	6.0	2	6.6	2	6.6

Source: RBI Staff Calculations

Liquidity contagion[9] in the financial system

2.15 An analysis of the three main sectors in the financial system, *i.e.* the banking sector, the insurance sector and the mutual funds sector reveals that the failure of any institution which has large lending position will have significant downstream impact. As discussed in paragraph 2.11 above, the insurance companies and the asset management companies are fund providers in the financial system and any failure can cause severe liquidity stress in the system

Table 2.2: Liquidity contagion in the financial system if one of the large lenders/investors is under distress

Trigger Institution	Per cent of capital loss to the financial system	Per cent of liquidity reserve loss to the financial system	No. of institutions becoming distressed
A	18.2	103.6	49
B	12.4	70.4	30
C	9.4	53.4	30
D	7.3	41.8	18
E	7.0	40.2	19

Source: RBI Staff Calculation

[9] Please refer the Annex-2

(Table 2.2). A stylised representation of how a liquidity contagion will play out is depicted in Chart 2.9

Scheduled Commercial Banks (SCBs)

Trends in Credit and Deposit

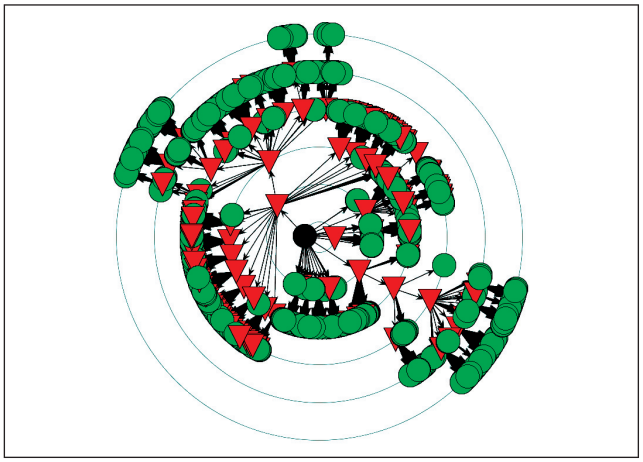
2.16 The SCBs recorded lower credit growth on y-o-y basis at 15.1 per cent in March 2013 than in September 2012 (15.8 per cent) and March 2012 (16.9 per cent), respectively. However, the y-o-y deposits growth of all SCBs increased marginally to 14.4 per cent in March 2013 from 14.3 per cent of the September 2012 (Chart 2.10). Despite the lower credit growth during March 2013, the Credit-Deposit (C-D) ratio of SCBs improved to 76.5 per cent during the quarter from 74.3 per cent in September 2012, indicating greater share of credit in their incremental assets.

2.17 At the bank-group level, except foreign banks, all the other bank-groups recorded lower credit growth and higher deposit growth in March 2013 compared to September 2012. The credit growth of foreign banks increased sharply to 14.6 per cent in March 2013 from 6.5 per cent in September 2012, whereas, the deposit growth of this bank-group declined to 4.0 per cent in March 2013 from 8.2 per cent in September 2012. The public sector banks registered credit and deposits growth of 14.2 per cent and 14.0 per cent in March 2013, respectively (Chart 2.10).

Seasonality in Credit and Deposit activities of Indian banks

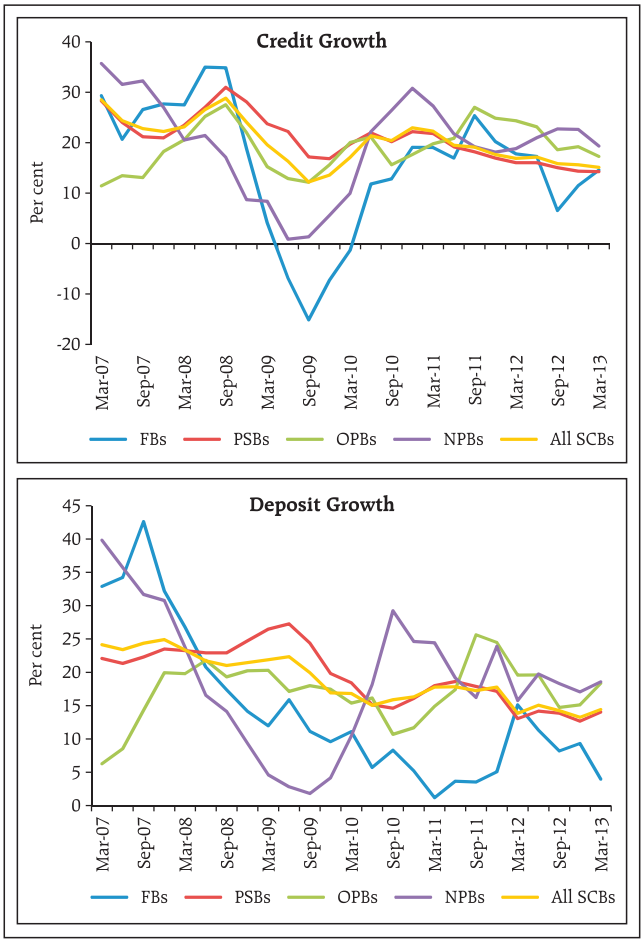
2.18 It can be observed that the banks' performance on credit delivery and deposit mobilisation improves during the last quarter of the financial year. The asset quality indicators also show an improvement during the last quarter of financial year. While there may be some business reasons for such a phenomenon, it is widely perceived that the banks adopt various

Chart 2.9: Liquidity Contagion[10] in the Financial System



Source: RBI Staff Calculation

Chart 2.10: Credit and Deposit Growth: Y-o-Y Basis



Note: Public sector banks (PSBs), new private banks (NPBs), old private banks (OPBs) and foreign banks (FBs)

Source: RBI Supervisory Returns

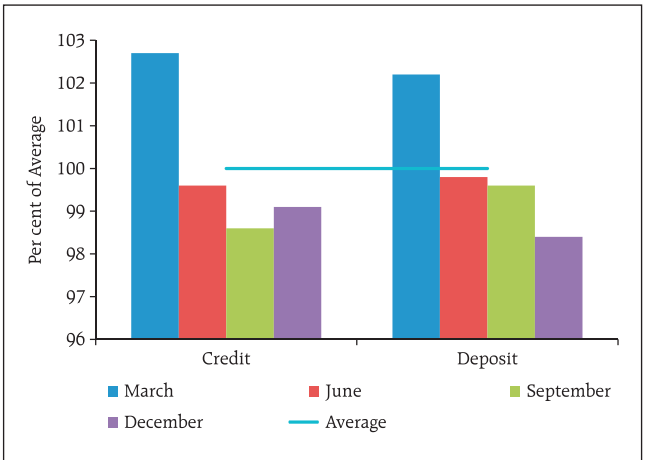
[10] The black ball in the centre represents the initial trigger institution. Consequent to this trigger institution coming under duress, there is a liquidity stress in the system. Red triangles are the institutions which even after using its liquidity buffers and callable assets cannot tide over the stress. The green balls from which further contagion emanates (represented by an arrow) are the institutions which overcomes the stress using both its buffers and callable assets. The green balls which do not cause any contagion are the institutions which prevail over the stress by just using their liquidity buffer.

strategies to improve their performance for the year-end balance sheets. In a competitive scenario, the incentive structures could be driving the banks towards 'window-dressing' practices.

2.19 An empirical analysis of seasonal factors of credit, deposit, slippage ratio, recovery and write-off[11] has been carried out to understand the behavioral aspects. The finding of this analysis shows that, credit and deposit, both have significant seasonality, which pulls them up during the last quarter of financial year (Chart 2.11).

2.20 The q-o-q growth in credit and deposit of SCBs increased to 7.3 per cent and 6.9 per cent in March 2013 from 4.6 per cent and 2.1 per cent of the previous quarter, respectively. However, the q-o-q growth in seasonally adjusted credit and deposit declined to 3.4 per cent and 2.9 per cent in March 2013 from 3.7 per cent and 3.2 per cent of the previous quarter, respectively. This shows that the improved credit and deposit growth during March 2013 was largely due to the seasonal factor (Chart 2.12).

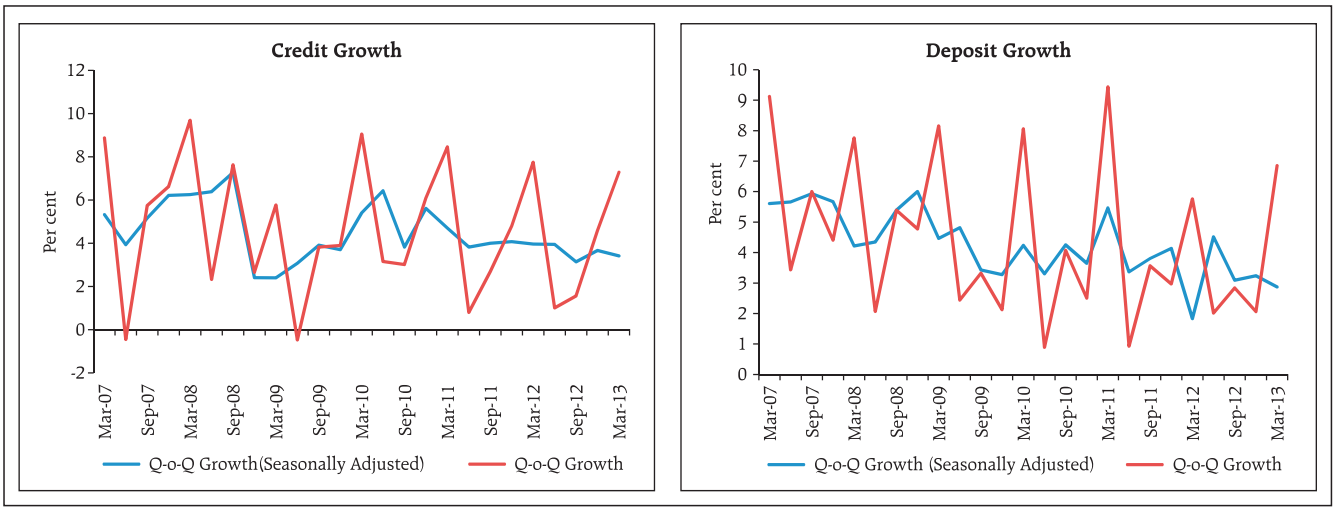
Chart 2.11: Seasonal Factors[12] of Credit and Deposit



Note: In the absence of seasonality in a variable, seasonal factors of all the four quarter should be 100(*i.e.* average). If seasonal factor of a quarter is above 100, it shows that because of seasonality the value of the variable in that quarter is higher, whereas, if it is below 100, it shows that seasonal factor is pulling the variable down.

Source: RBI Supervisory Returns and Staff Calculation

Chart 2.12: Seasonality in Credit and Deposit



Source: RBI Supervisory Returns and Staff Calculations

[11] Findings on seasonality in the asset quality are discussed in the Para No. 2.35.

[12] Seasonal Factors are estimated using X12-ARIMA method.

Sectoral Deployment of Credit

2.21 There were no major changes in the overall distribution of sectoral credit allocation over the last two years. The trends in credit flow to some select sectors like Agriculture, Exports, Medium and Small Enterprises (MSE), and NBFCs have been studied in this section. These sectors account for around 40 per cent of the total bank credit as at end March 2013 (Chart 2.13). The sectors under 'Others' include, advances to central and state governments, food credit, advances to public sector units, *etc.*

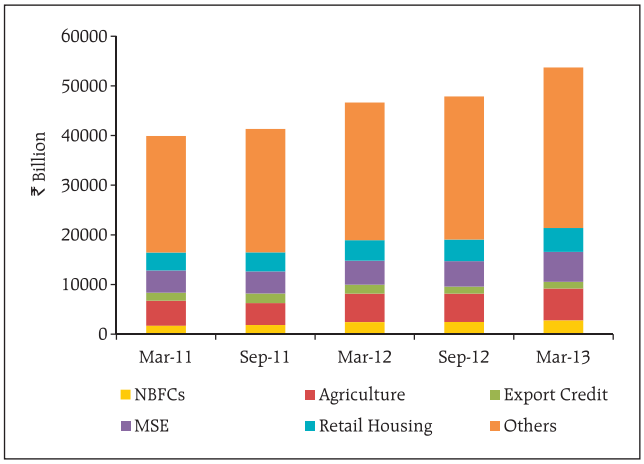
2.22 The growth in the credit to the agriculture declined sharply to 12.5 per cent in March 2013 from 29.8 per cent of September 2012.

2.23 Export credit continues to contract, an issue that has been engaging the attention of policy makers in the light of increasing trade deficit. The Reserve Bank has been initiating measures from time to time to direct credit to the sector at competitive rates. The recent report of a technical committee[13] constituted by the Reserve Bank has recommended several measures to improve the flow of credit to export sector, reduce transaction costs and incentivise exports & export financing.

2.24 Credit growth to MSE sector, which has a large potential for employment generation, increased significantly to 25.6 per cent in March 2013 from 15.5 per cent and 7.6 per cent in September 2012 and March 2012, respectively. The increase in credit growth of MSE sector registered during the quarter needs to be sustained, for improving the overall credit deployment for this sector. The credit growth to retail housing also increased to 16.4 per cent from 13.0 per cent in September 2012 (Chart 2.14).

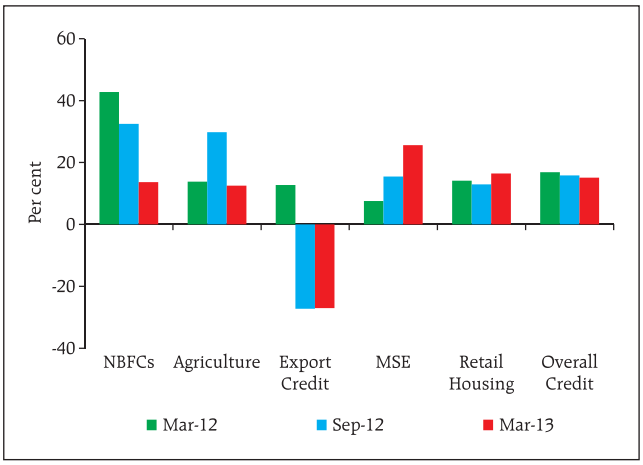
2.25 Bank credit to NBFCs recorded a decline in growth on y-o-y basis to 13.6 per cent in March 2013 from 32.5 per cent and 42.8 per cent recorded in

Chart 2.13: Allocation of Credit – Select Sectors



Source: RBI Supervisory Returns

Chart 2.14: Y-o-Y Credit Growth - Select Sectors



Source: RBI Supervisory Returns

[13] Report of the Technical Committee on Services/Facilities to Exporters.

September 2012 and March 2012, respectively. This decline is attributed to lower demand for auto & consumer loans, stricter norms on lending against gold, withdrawal of priority sector status for some loans given by SCBs to NBFCs for on-lending to specific purposes, *etc.*

Soundness

Capital Adequacy

2.26 The system level Basel II Capital to Risk Weighted Assets Ratio (CRAR) improved slightly to 13.8 per cent as at end March 2013 from 13.6 per cent as at end September 2012 (Chart 2.15). The y-o-y growth in risk weighted assets (RWA) of SCBs was at 17.1 per cent in March 2013 compared to 14.5 per cent in September 2012. The rise in capital was attributed mainly to increase in Tier I capital.

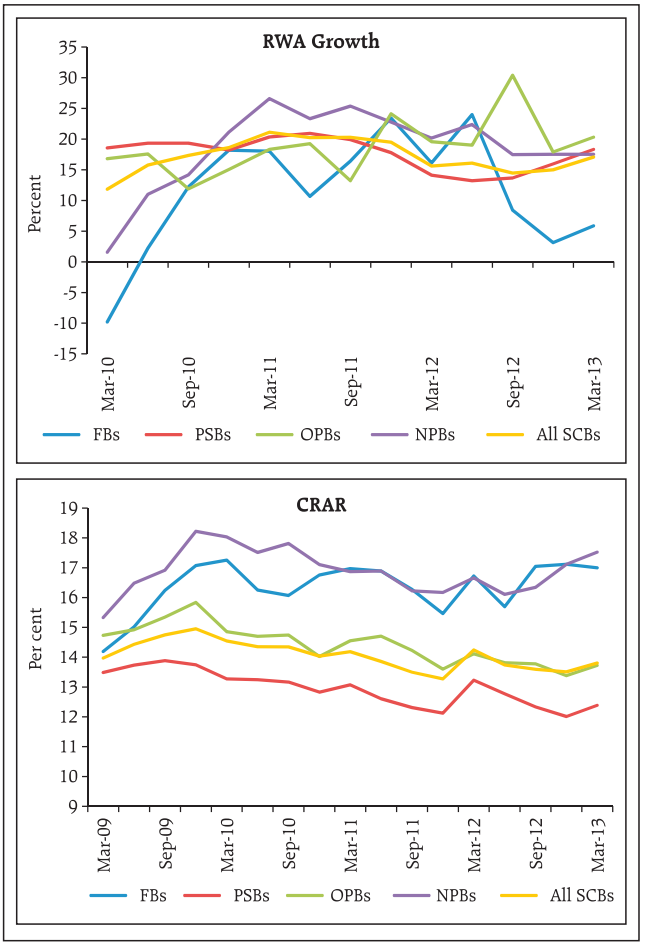
2.27 At the bank-group level, public sector banks continued to register the lowest CRAR at 12.4 per cent in March 2013 followed by old private banks (Chart 2.15).

Leverage

2.28 The Tier I leverage ratio[14] of all SCBs increased to 6.4 per cent in March 2013 from 6.1 per cent and 6.2 per cent of September 2012 and March 2012, respectively, due to the higher Tier I capital growth relative to the growth in the total assets (Chart 2.16).

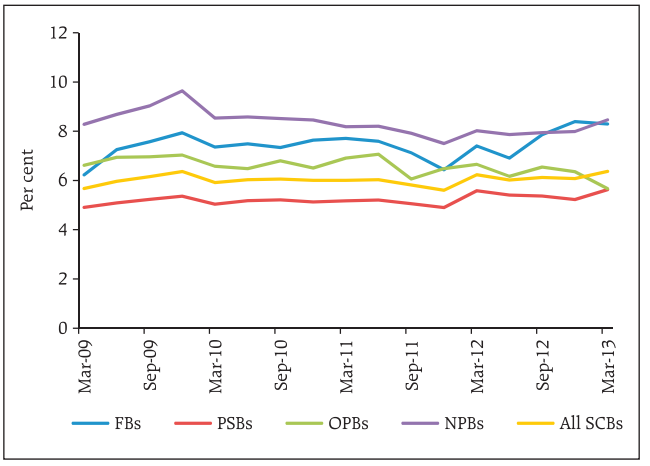
2.29 An analysis of the bank-wise leverage[15] was carried out, in conjunction with the trends in the riskiness of their assets. The leverage was measured as total assets to capital (using Tier I as well as Tier I & II), while the ratio of RWA to total assets was taken as an indicator of the degree of riskiness of the assets portfolio. It has been observed that the banks which have lower ratio of RWA to total assets tend to have a higher leverage (Chart 2.17).

Chart 2.15: Capital Adequacy



Source: RBI Supervisory Returns

Chart 2.16: Leverage Ratio of SCBs

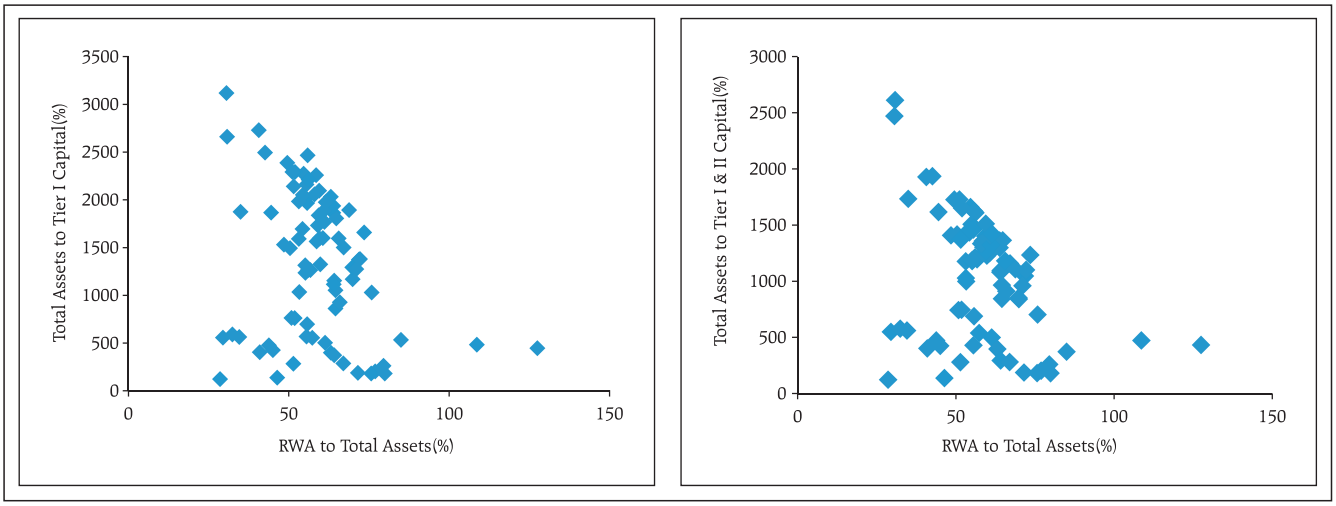


Source: RBI Supervisory Returns

[14] Tier I leverage ratio is defined as the ratio of Tier I capital to Total Assets, under Basel III. Higher the ratio, lower the vulnerability.

[15] The usage of leverage here is different from the leverage ratio (as defined under Basel III). The leverage is taken as the ratio of total assets to capital.

Chart 2.17: Bank-wise Leverages and their Riskiness of Assets-March 2013



Source: RBI Supervisory Returns and Staff Calculations

Estimation of Losses, Provisioning and Capital Adequacy

2.30 At present, banks in India follow 'incurred loss model' to recognise credit losses of banks. Under the approach, provision is made for loans, only on occurrence of an identifiable credit event. The timing and measurement of losses are, therefore, based on estimating losses that have been incurred as on the reporting date. This model does not permit recognising credit losses based on events that are expected to occur in the future and hence it is not a forward looking approach. As suggested by the BCBS, there is a need to move towards a new accounting standard, which is based on the concept of expected losses (EL) and unexpected losses (UL) to measure the potential losses in a credit portfolio (Box 2.1). Banks are expected to cover the UL by capital and EL by provisions. The EL is generally derived as the mean of the credit loss distribution and has a forward-looking element[16].

2.31 The estimated EL of SCBs at system level was around 2.0 per cent of total advances as at end March 2013 and is expected to rise to 2.3 per cent by September 2013 under baseline scenario (Table 2.3). The present level of total provisions[17] being maintained by the SCBs at 2.6 per cent of total

Table 2.3: Estimated Losses of SCBs

(Per cent to Total Advances)

End-Quarter	Expected Loss			Unexpected Loss			Expected Shortfall		
	Baseline	Medium Stress	Severe Stress	Baseline	Medium Stress	Severe Stress	Baseline	Medium Stress	Severe Stress
Mar-13*	2.0	-	-	6.9	-	-	7.0	-	-
Sep-13	2.3	2.5	2.8	7.2	7.8	8.5	7.3	8.0	8.7
Mar-14	2.1	2.6	3.1	7.0	7.9	8.8	7.1	8.0	9.0

* Estimation of losses for the quarter ended Mar-13 is based on the observed numbers.
Source: Supervisory Returns and Staff Calculations

[16] Internationally, it is recommended to use estimated losses (EL & UL) approach for the purpose of making provisions and capital, for the next one year. For this purpose, PD is derived based on annual slippage. As the purpose of this study is to judge the adequacy of provisioning and capital levels being maintained by SCBs and not to estimate the required level of provisions and capital to be maintained for next one year, the PDs being used here is based on GNPA.

[17] Total Provisions include provisions for credit losses, risk provision for standard advances and provisions for restructured standard advances.

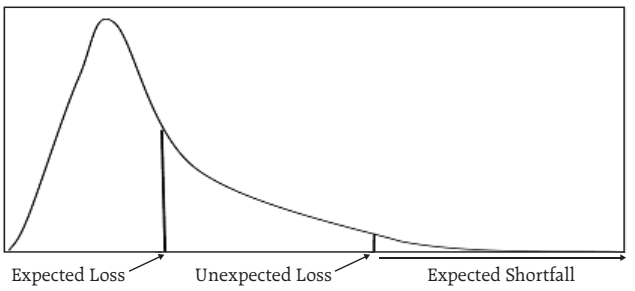
Box 2.1: Estimation of Losses

Expected Loss, Unexpected Loss and Expected Shortfall of Scheduled Commercial Banks in India

The EL is generally derived as the mean of the credit loss distribution and has forward-looking element as it is capable of incorporating 'through-the-cycle' view of probability of default.

A pictorial presentation of loss distribution depicting EL, UL and expected shortfall is given in the chart below.

Chart : Loss Distribution of Credit Portfolio



The following standard definitions have been used for estimation of these losses:

Expected Loss (EL): The EL is the average credit loss that the banking system expects from their credit exposure.

Unexpected Loss (UL): The UL at 100(1-α) per cent-level of significance is the loss may occur at the α-quantile of the loss distribution.

Expected Shortfall (ES): When the distributions of loss (Z) are continuous, expected shortfall at the 100(1-α) per cent confidence level (ES_α (Z)) is defined as, ES_α (Z) = E[Z | Z≥VaR_α (Z)]. Hence, Expected shortfall is the conditional expectation of loss given that the loss is beyond the VaR level.

These losses were estimated as: Loss = PD X LGD X EAD

Where, EAD = Exposure at Default, is the total advances of the banking system. EAD includes only on-balance sheet items as PD was derived only for on balance sheet exposures.

LGD = Loss Given Default. Under baseline scenario, the average LGD was taken as 60 per cent as per the RBI guidelines on '*Capital Adequacy – The IRB Approach to Calculate Capital Requirement for Credit Risk*'. LGD was taken at 65 per cent and 70 per cent under medium and severe macro-economic conditions, respectively.

PD = Probability of Default. PD was defined as gross non-performing advances to total advances ratio. Because of unavailability of data on number of default accounts, the size of default accounts (*i.e.* NPA amount) has been used for derivation of PDs.

The above losses *viz., EL, UL and ES*, were estimated by using a simulated PD distribution. As a first step; an empirical distribution of the PD was estimated using Kernel Density Estimate, second; using the empirically estimated probability density function, 20000 random numbers were drawn based Monte Carlo Simulation and finally, for calculation of expected loss, unexpected loss and expected shortfall, PDs were taken as average PD, 99.9 per cent VaR of PD and average PD beyond 99.9 per cent loss region, respectively.

advances as at end March 2013, is adequate under the baseline scenario. The EL may further increase to 3.1 per cent under severe stress conditions by March 2014, leaving a gap between the present provisioning level and EL under heightened adverse macroeconomic conditions[18]. Therefore, it would be prudent for the SCBs to increase their provisioning from the present levels. On the other hand, the UL and expected shortfall of SCBs are estimated to be around 7.0 per cent and 7.1 per cent of total advances

[18] The stress scenarios have been defined in Table 2.6 under macro-stress tests (Para No. 2.46).

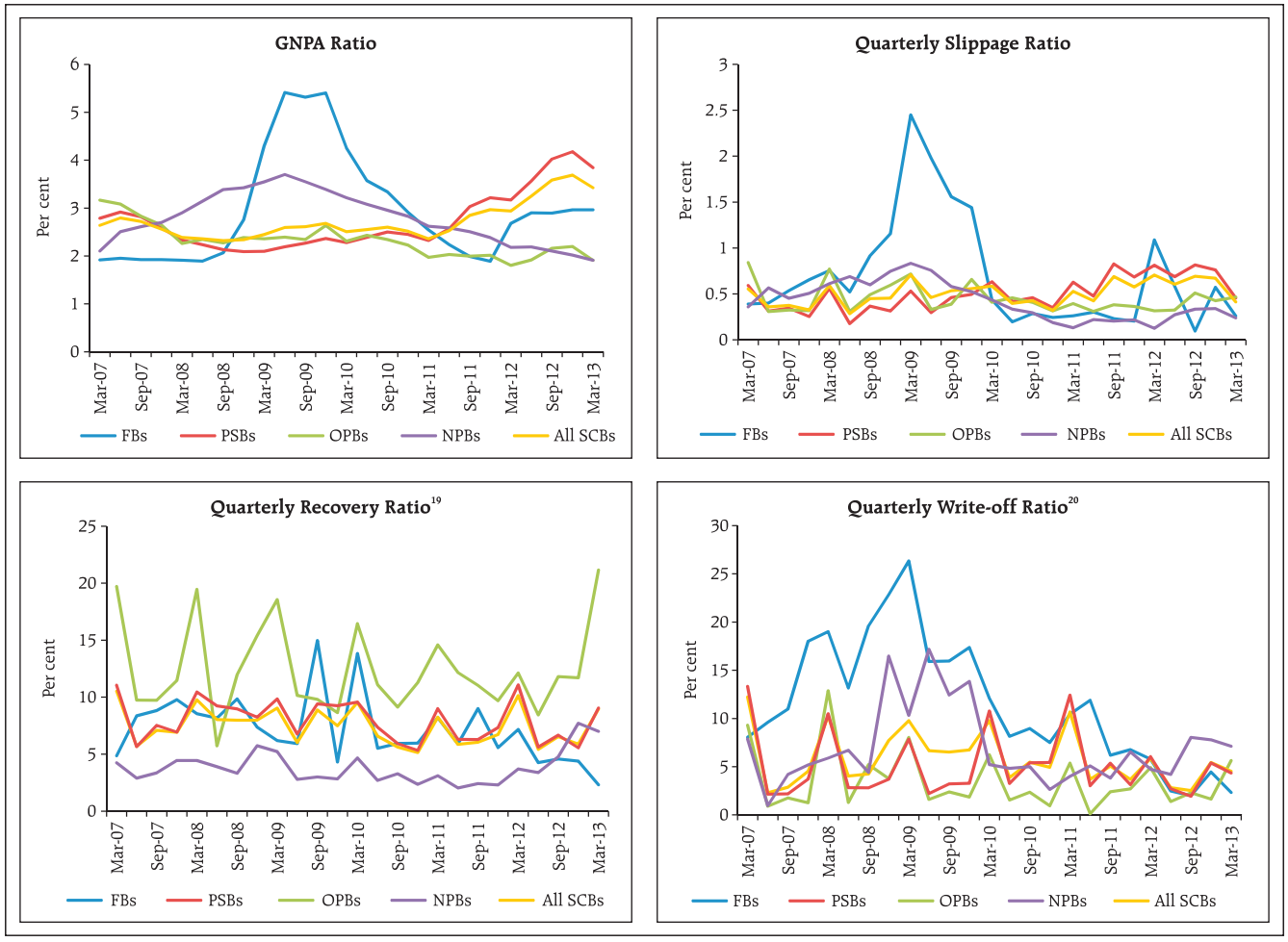
respectively for the quarter ended March 2013. The corresponding losses may further rise to 8.8 per cent and 9.0 per cent as at end March 2014 under severe stress scenario. The UL and expected shortfall are less than the Tier I capital to total advances ratio of 12.1 per cent maintained by SCBs as at the end of March 2013.

Asset Quality

2.32 The asset quality of SCBs, which was deteriorating continuously, recorded an improvement in March 2013 quarter. The Gross Non-Performing Advances (GNPA) ratio of SCBs improved to 3.4 per cent as at end March 2013 against 3.6 per cent as at end September 2012. The net NPA ratio declined to 1.4 per cent as at end March 2013 from 1.6 per cent as at end September 2012. This decline in NPA was attributed to the lower slippage, improved recovery and higher write-off during the quarter (Chart 2.18). Change in classification for restructured advances with effect from April 1, 2015 may have some adverse impact on the NPAs, unless banks take preventive measures in this regard.

2.33 At the bank-group level, the GNPAs of public sector banks was highest and stood at 3.8 per cent as at end March 2013, followed by that of the foreign

Chart 2.18: Assets Quality Indicators



Source: RBI Supervisory Returns

[19] Quarterly recovery ratio is defined as percentage recovery during the quarter to the NPA at the beginning of the quarter.

[20] Quarterly write-off ratio is defined as percentage write-offs during the quarter to the NPA at the beginning of the quarter.

banks. The quarterly slippage ratio of public sector banks declined to 0.5 per cent for the quarter ended March 2013 from 0.8 per cent recorded during September 2012. Quarterly slippage of foreign banks increased to 0.3 per cent and 0.1 per cent for the corresponding periods. The old private banks registered highest quarterly recovery at 21.2 per cent during quarter ended March 2013 followed by the public sector banks at 9.1 per cent. All the bank groups, except new private banks, recorded higher write-off during the quarter ended March 2013 as compared to quarter ended September 2012 (Chart 2.18).

Seasonality in Asset Quality

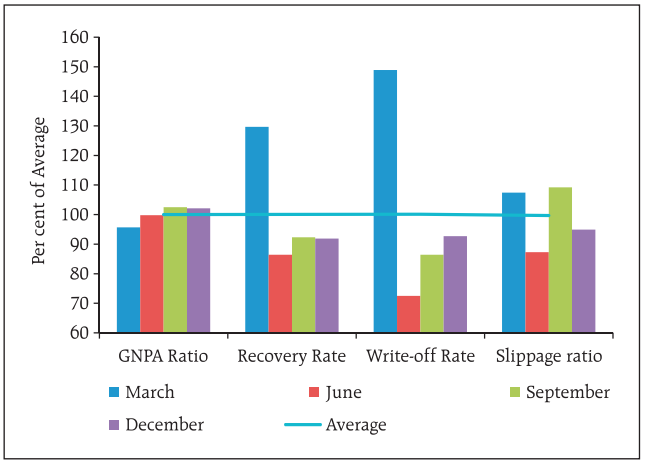
2.34 An empirical seasonal analysis shows that during the March quarter, the slippages of standard advances are more than the average slippages of all four quarters, but, the GNPA ratio declines during this quarter mainly because of the higher recovery and write-off of bad loans observed during the last quarter (March) of financial year (Chart 2.19).

Restructuring of loans

2.35 The restructured standard loans of SCBs as proportion of their total loans have registered a marginal decline from 5.9 per cent as at end September 2012 to 5.7 per cent as at end March 2013. Among the bank groups, this ratio, at 7.1 per cent, was the highest for the public sector banks followed by old private banks. (Chart 2.20).

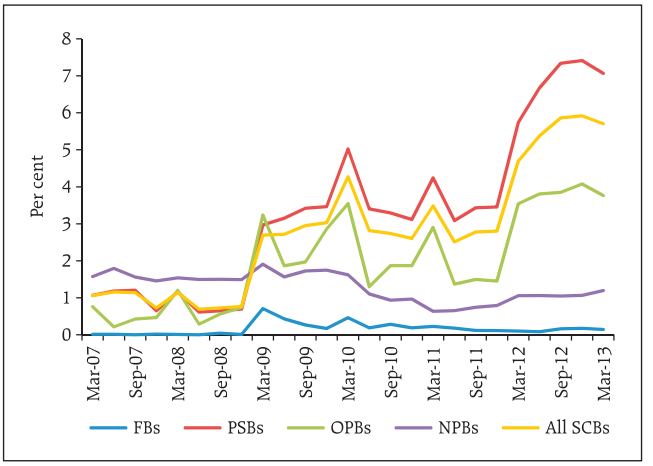
2.36 Industry and services sector account for a major proportion of restructured loans of the banking sector. As these sectors have a relatively higher share of total bank credit, the trends in restructuring of loans to these sectors make a bigger impact on the health of the banking sector. Within the industrial sector, a few sub-sectors, namely; Iron & Steel, Textile, Infrastructure, Power generation and Telecommunications; have become a cause of concern

Chart 2.19: Asset Quality - Seasonal Factors[21]



Source: RBI Supervisory Returns and Staff Calculations

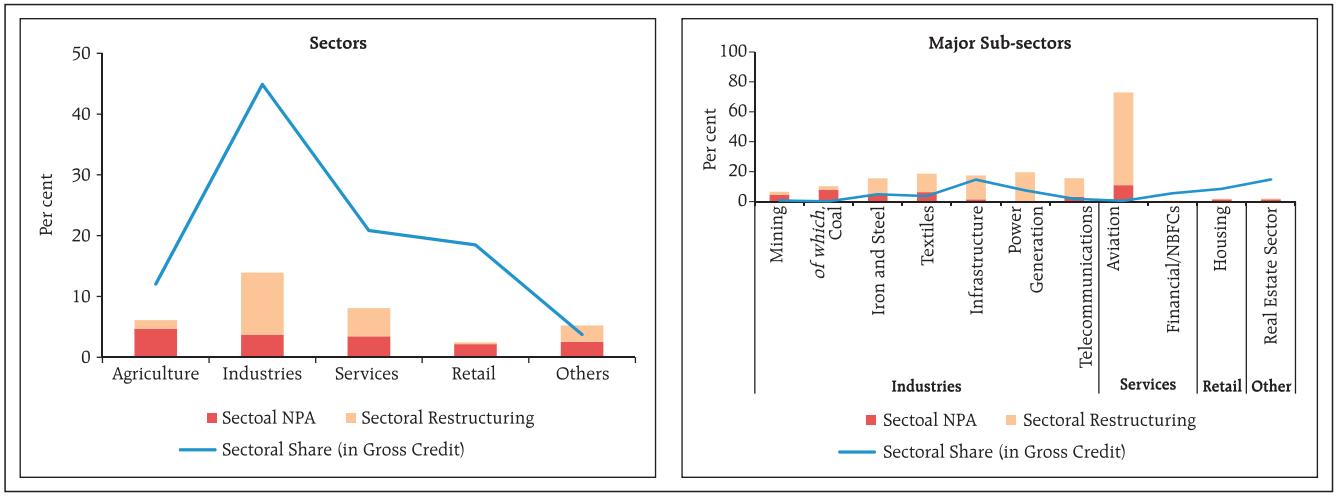
Chart 2.20: Restructured Standard Loans to Total Loans Ratio



Source: RBI Supervisory Returns

[21] Seasonal Factors are estimated using X12-ARIMA method.

Chart 2.21: Stressed Loans : Sector-wise – March 2013



Source: RBI Supervisory Returns

in recent times. In case of sectors like Aviation, though the incidence of restructuring is high, its share of bank credit is relatively low (Chart 2.21).

2.37 The increasing incidence of forbearance in the banking system especially in Europe has emerged as a concern in recent times against the backdrop of a slowdown in the global economy. Forbearance refers to the act of granting a concession to the borrower by the lender (bank), in view of some economic or legal reasons related to temporary financial difficulties being faced by the borrower. While forbearance is essential and good in the case of viable ventures, forbearance to avoid classification as NPL or simply keeping zombie companies alive, leads to inefficient allocation of resources and eventual problems for the lender.

2.38 The previous FSR had covered the unhealthy trends in restructuring of advances by banks in India, especially the public sector banks. In this context the recommendations of a Reserve Bank Working Group[22] to review the restructured loans have been accepted and the extant asset classification benefits available on restructuring will be withdrawn effective from April 1, 2015 - with the exception of provisions related to changes in date of commencement of commercial operation (DCCO) in respect of infrastructure and non-infrastructure project loans.

2.39 The Working Group had also recommended that, till such time the regulatory forbearance on asset classification is dispensed with, the provision requirement on such accounts should be increased from the present 2 per cent to 5 per cent, in order to prudently recognise the inherent risks in restructured standard assets in the interregnum. The Reserve Bank, therefore has increased[23] the provision on restructured standard accounts to 2.75 per cent from 2.00 per cent. The provision has been increased to 5 per cent in respect of new restructured standard accounts (flow) with effect from June 1, 2013 and in a phased manner for the stock of restructured standard accounts as on March 31, 2013.

Profitability

2.40 The profitability of all SCBs, measured by return on assets (RoA) and return on equity (RoE) declined to 1.0 per cent and 12.8 per cent in March 2013 from 1.1 per cent and 13.4 per cent in March 2012, respectively. The lower growth in profit after tax (PAT) was mainly attributed to the lower y-o-y growth in net interest income (NII) at 11.0 per cent in March

[22] Report of the Working Group to review the existing prudential guidelines on restructuring of advances by banks/financial institutions.

[23] http://rbidocs.rbi.org.in/rdocs/notification/PDFs/CDRS30052013F.pdf

2013 against 15.8 per cent in the previous year. The decrease in NII is accompanied by a reduction in the net interest margin (NIM) to 3.0 per cent in March 2013 from 3.1 per cent in the previous two years. The SCBs have seen a faster growth in their other operating income (OOI), with the y-o-y growth increasing to 13.8 per cent in March 2013 from 7.4 per cent in the previous year (Table 2.4).

2.41 The contribution of NII to total operating income(TOI) declined marginally to 72.1 per cent in 2012-13 from 72.6 per cent in the previous year, whereas, contribution of OOI to TOI increased to 27.9 per cent in 2012-13 from 27.4 per cent in the previous year. This rise in the contribution of OOI to total income was attributed to the higher contribution recorded from security trading (10.5 per cent in 2012-13 against 3.6 per cent in the previous year) and miscellaneous income (Table 2.5).

2.42 Among the major bank groups, the contribution of NII to the TOI is highest in the case of the public sector banks followed by old private banks; whereas the contribution of OOI to TOI is highest in the case of new private banks followed by foreign banks (Chart 2.22).

2.43 Another emerging area that is adding to banks' OOI is commission on account of insurance business. For the year 2011-12, banks accounts for ₹19.9 Billion,

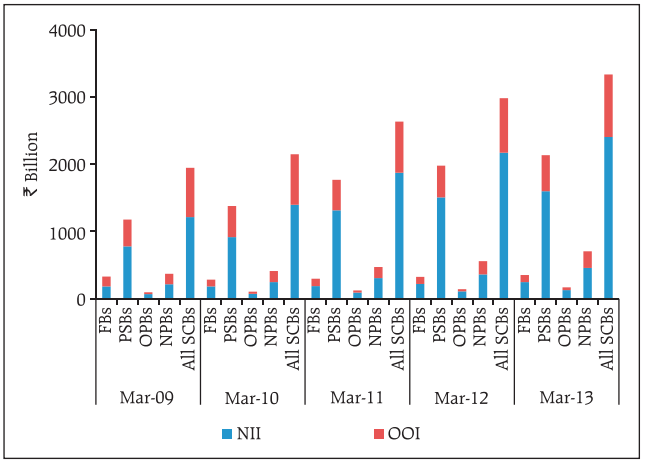
Table 2.4: Profitability of SCBs

(Per cent)

	Return on Assets	Return on Equity	PAT Growth	Net Interest Income Growth	Other Operating Income Growth	NIM[24]	Spread[25]
Mar-09	1.1	14.5	23.3	24.4	24.0	2.7	3.5
Mar-10	1.0	12.9	4.3	14.8	3.1	2.7	3.5
Mar-11	1.1	13.6	23.6	34.6	0.5	3.1	3.8
Mar-12	1.1	13.4	14.6	15.8	7.4	3.1	3.8
Mar-13	1.0	12.8	12.8	11.0	13.8	3.0	3.3

Source: RBI Supervisory Returns

Chart 2.22: Composition of Total Operating Income: Bank-group wise



Source: RBI Supervisory Returns

Table 2.5 Income components of SCBs - Select Ratios

(Per cent)

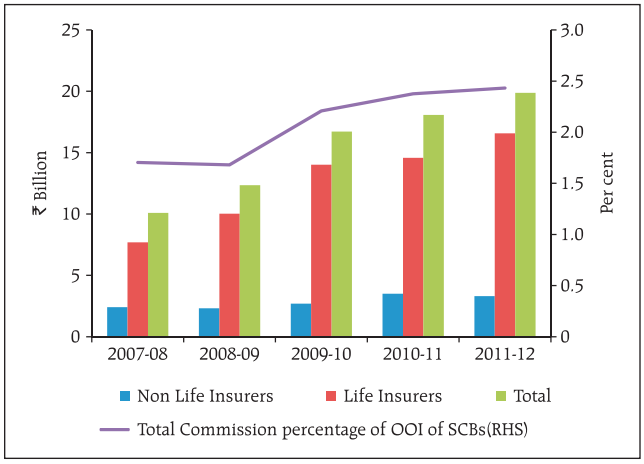
	Net Interest Income to TOI	Other Operating Income to TOI	Risk Provisions to TOI	Fee income to OOI	Profit/(Loss) on Forex operations to OOI	Profit/(Loss) on securities trading to OOI	Dividend income to OOI	Miscellaneous income to OOI
Mar-09	62.2	37.8	12.3	47.3	16.9	21.1	2.4	12.3
Mar-10	64.7	35.3	12.6	51.1	12.8	18.0	2.7	15.5
Mar-11	71.1	28.9	14.3	57.7	18.3	4.0	3.2	16.7
Mar-12	72.6	27.4	17.0	59.5	18.7	3.6	3.1	15.1
Mar-13	72.1	27.9	16.8	55.1	15.4	10.5	2.5	16.4

Note: TOI-Total Operating Income; OOI- Other Operating Income.
Source: RBI Supervisory Returns

[24] Net Interest Margin(NIM): NIM of SCBs is derived by taking weighed average of bank wise NIM, weighted by asset size.

[25] Spread between Yield on Advances & Bills Discounted and Cost of Customer Deposits.

Chart 2.23: Income to SCBs from Commission of Insurance Companies



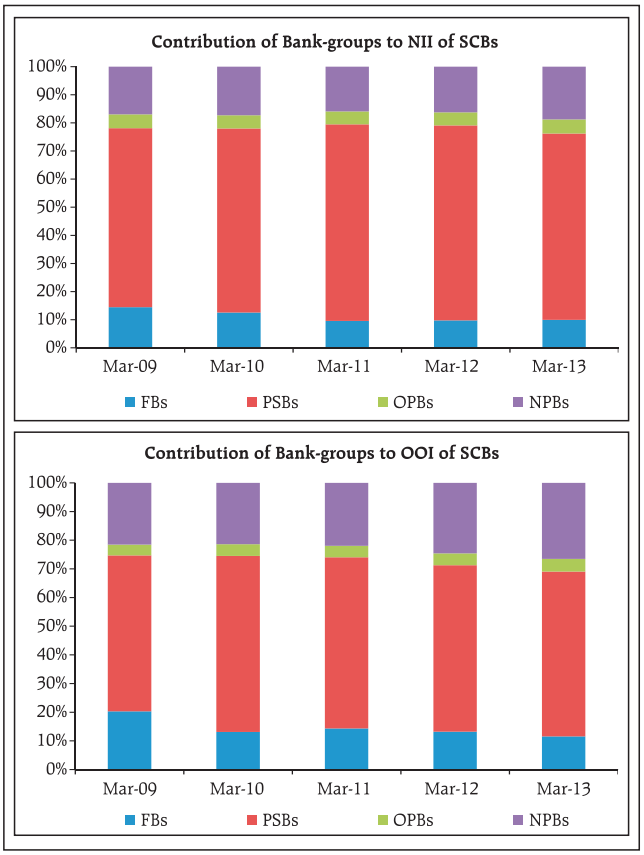
Source: IRDA and RBI Supervisory Returns

which is 9.7 per cent of total commission paid by insurers (life as well as non-life) and 2.4 per cent of the OOI of all SCBs (Chart 2.23).

2.44 The contribution of public sector banks as a bank-group, to NII and OOI of all SCBs, declined to 66.3 per cent and 57.5 per cent in March 2013 from 69.3 per cent and 58.1 per cent in the previous year, respectively. The contribution of new private banks to NII and OOI of all SCBs increased to 18.7 per cent and 26.5 per cent in March 2013 from 16.3 per cent and 24.6 per cent in the previous year, respectively (Chart 2.24).

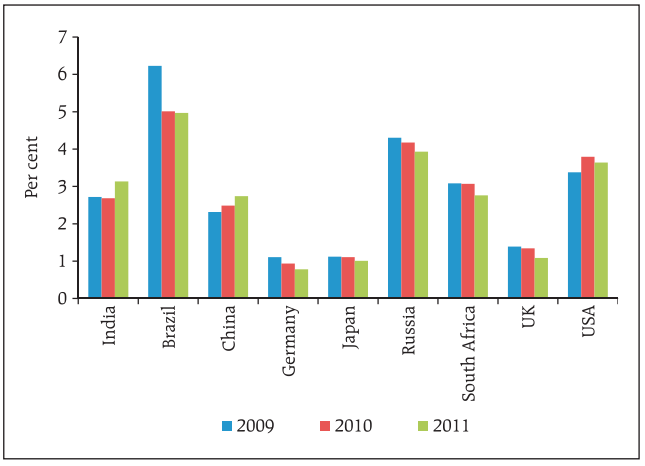
2.45 The present levels of NIM and spread of the SCBs in India as a whole, may indicate that there is scope for banks to improving their efficiency. A comparison of NIM, for the three years through 2011, of select countries shows that NIM of banks in India is comparable to that of BRICS countries (Chart 2.25).

Chart 2.24: Contribution of Bank-groups to NII and OOI of SCBs



Source: RBI Supervisory Returns

Chart 2.25: NIM of Select Countries



Note: data on NIM for the select countries (except India) is available till 2011 only.
Source: Financial Development and Structure Dataset (updated April 2013), World Bank

Resilience - Stress Tests

2.46 The resilience of the Indian banking system to macroeconomic shocks was tested through a series of macro stress tests for credit risk at *system*, *bank-group* and *sectoral* levels. These tests are based on baseline scenario and two adverse (medium and severe) risk scenarios (Table 2.6). The adverse scenarios were derived based on up to 1 standard deviation for medium risk and 1.25 to 2.0 standard deviations for severe risk (10 years historical data).

Credit Risk - System Level

2.47 The macro stress tests for credit risk suggest that under baseline scenario, GNPA ratio of all SCBs is expected to rise to around 3.8 per cent by September 2013 from 3.4 per cent of March 2013, whereas, under the *assumed* improved macroeconomic condition for the financial year (FY) 2013-14 (compared to 2012-13), GNPA ratio may decline subsequently to 3.5 per cent by March 2014. However, under severe stress scenario, GNPA ratio may rise to 4.4 per cent by March 2014 (Chart 2.26). Under such severe risk scenario, the system level CRAR of SCBs could decline to 12.2 per cent by March 2014, but will still remain above the regulatory requirement of 9 per cent (Chart 2.27). This projection of GNPAs, however, does not capture the likely impact of the withdrawal of forbearance for restructured loans.

Credit Risk - Bank Group Level

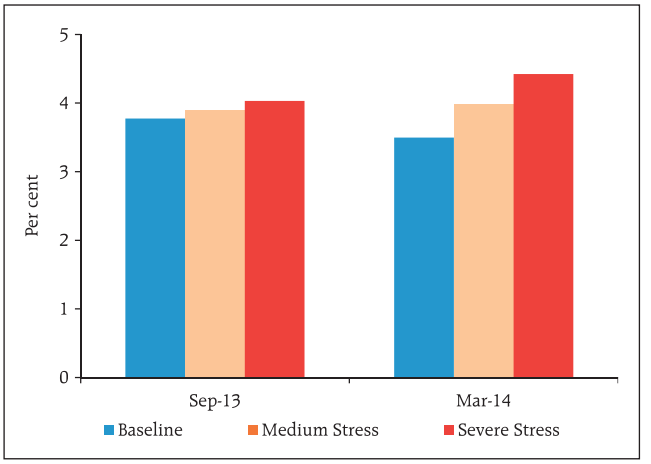
2.48 Among the bank-groups, public sector banks are projected to register the highest GNPA ratio. Under baseline scenario, the GNPA of public sector banks and foreign banks may rise to 4.1 per cent and 3.2 per cent by March 2014 from 3.8 per cent and 3.0 per cent in March 2013, respectively. Whereas, GNPA ratio of both old private banks and new private banks may rise to 2.3 per cent by March 2014 from 1.9 per cent in March 2013 (Chart 2.28).

Table 2.6 Macroeconomic Scenario Assumptions (FY: 2013-14)[26]

(Per cent)

	Baseline	Medium Stress	Severe Stress
GDP Growth	5.7	4.0	2.4
WPI Inflation	5.5	7.7	9.8
Short-term Interest Rate	6.8	8.4	10.0
Exports to GDP Ratio	16.8	15.1	13.4
Gross Fiscal Deficit	4.8	5.9	7.0

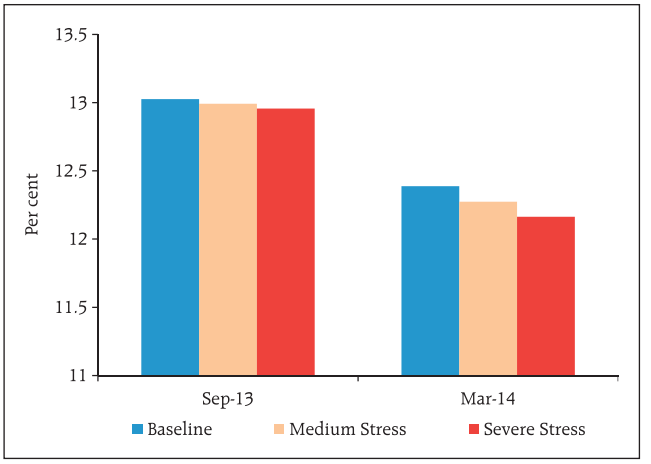
Chart 2.26: Projection of System Level GNPAs



Note: The projection of system level GNPA has been done using three different but complementary econometric models, *viz.*, Multivariate regression, Vector Autoregressive (which takes into accounts feedback impact of credit quality to macro variables and interaction effects) and Quantile regression (which can deals tail risk and takes into account non-linear impact of macroeconomic shocks).

Source: RBI Supervisory Returns and Staff Calculations

Chart 2.27: Projection of System Level CRAR

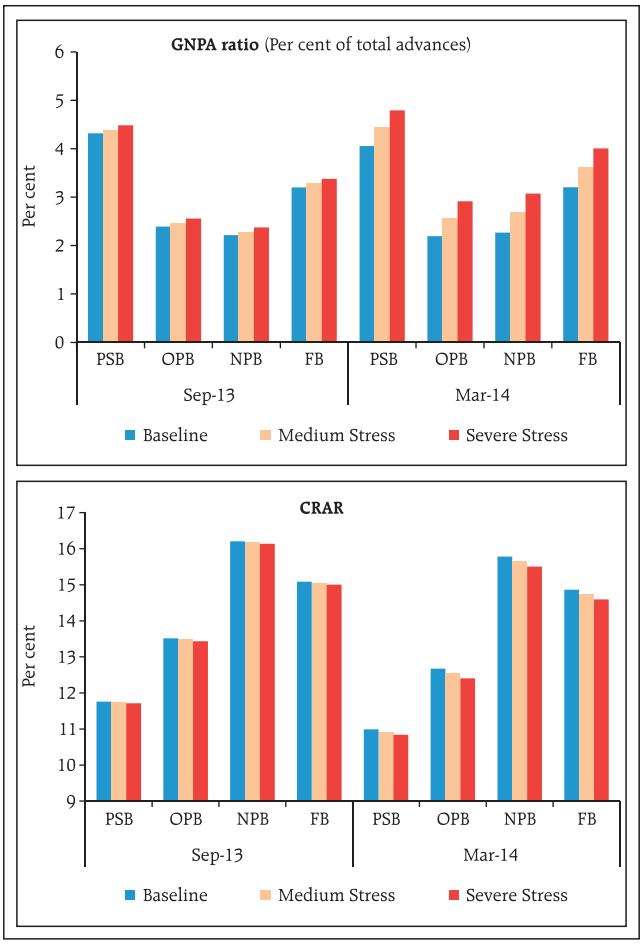


Source: RBI Supervisory return and Staff Calculations

[26] These stress scenarios are stringent and conservative assessments under hypothetical-severely adverse economic conditions and should not be interpreted as forecasts or expected outcomes.

2.49 CRAR of PSBs, which is the lowest at around 12 per cent, may decline to 10.8 per cent by March 2014 under severe stress scenario. Under such severe risk scenario, the CRAR of new private sector banks, old private banks and foreign banks may decline to 15.5 per cent, 12.4 per cent and 14.6 per cent from 17.5 per cent, 13.8 per cent and 17.0 per cent recorded as at end of March 2013 quarter, respectively. However, even under severe stress scenario, the CRAR of all the bank groups is seen to remain above the regulatory requirement of 9 per cent (Chart 2.28).

Chart 2.28: Projection of Bank-group wise GNPAs and CRAR



Source: RBI Supervisory Returns and Staff Calculations

Credit Risk - Sector Level

2.50 Macro stress test of sectoral credit risk revealed that, among the selected seven sectors, Construction and Agriculture are expected to register the highest NPA ratios of around 4.7 to 4.8 per cent by March 2014, followed by Iron & Steel sector. The adverse macroeconomic shocks seem to have maximum impact on Iron & Steel and Construction followed by Engineering (Table 2.7).

Table 2.7 Projected Sectoral NPA

(Per cent to gross advances)

Sector	Mar-13 (Actual)	Sep-13			Mar-14		
		Baseline	Medium Risk	Severe Risk	Baseline	Medium Risk	Severe Risk
Agriculture	4.7	4.9	5.1	5.2	4.6	4.9	5.1
Construction	4.0	4.5	4.6	4.7	4.8	5.1	5.5
Cement	2.7	3.4	3.4	3.5	3.9	4.2	4.4
Infrastructure	1.5	1.9	2.0	2.1	2.2	2.5	2.7
Iron and Steel	4.0	4.2	4.4	4.6	4.0	4.8	5.5
Engineering	3.7	4.1	4.2	4.5	3.9	4.5	5.1
Automobiles	1.8	2.1	2.2	2.2	2.1	2.3	2.4

Source: RBI Supervisory Returns and Staff Calculations

Top Down Stress Tests - Bank Level

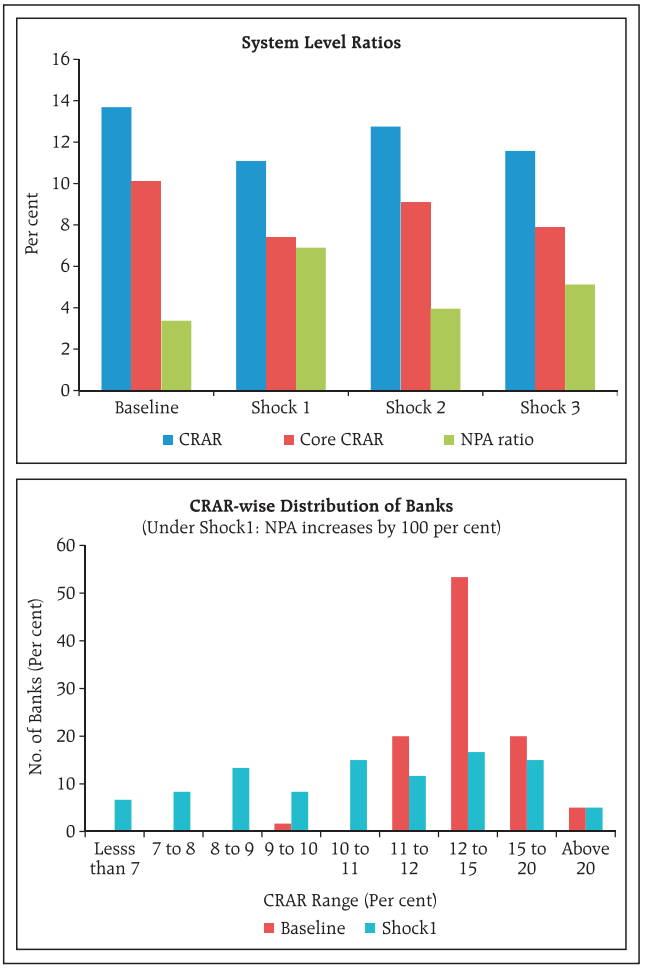
2.51 A number of single factor sensitivity stress tests (*top-down*) were carried out on SCBs (60 banks comprising 99 per cent of total banking sector assets) to assess their vulnerabilities and resilience under various scenarios. The resilience of the commercial banks in respect of credit, interest rate and liquidity risks were studied through top down sensitivity analysis by imparting extreme but plausible shocks. The results are based on March 2013 data[27]. The same set of shocks was used by 25 select SCBs (comprising about 75 per cent of total assets) to conduct *bottom up* stress tests. The results of the *bottom up* stress tests broadly reflected those of the *top down* stress tests and reconfirmed the resilience of the banking system to a wide range of shocks.

Credit Risk

2.52 The impact of different static shocks for banks as on March 2013 shows that the system level CRAR remained above the required minimum of 9 per cent. The capital losses at the system level could be about 29 per cent in the case of severe stress condition (Shock 1). The stress test results, further showed that some banks would fail to maintain required CRAR under stress scenarios (Chart 2.29).

2.53 The stress tests on credit concentration risk of banks show that the impact under various stress scenarios is not significant. The impact on CRAR under the assumed scenarios of default of top three individual borrowers and default of top group borrower would be 240 and 185 basis points respectively and the system should be able to withstand this default. However, at individual level, a few banks with high concentration might be seriously impacted under stressed conditions.

Chart 2.29: Top Down Stress Tests - Credit Risk



Note: Shock 1: NPAs increases by 100 per cent
Shock 2: 30 percent of restructured advances turn into NPAs (Sub-Standard)
Shock 3: 30 percent of restructured advances are written-off (Loss)

Source: RBI Supervisory Returns and Staff Calculations

[27] For details on stress tests, please refer to the Annex-2.

Interest Rate Risk

2.54 The interest rate risk for the trading book (direct impact) under various stress scenarios is manageable with reduction in CRAR by 1 percentage points at the system level, though a few small banks would be impacted adversely. The major impact is due to upward movement (2.5 percentage points) of yield curve, especially for the low maturity buckets because of their relatively large size. For the same stress scenario the capital position of the banking system gets impacted by about 2.6 percentage points for the banking book.

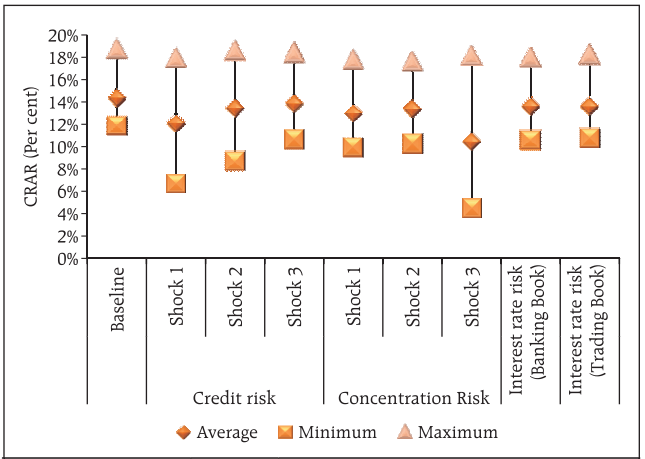
Liquidity Risk

2.55 To capture the impact on the liquidity risk, analysis has been done with five definitions of liquid assets[28]. As per these definitions, the liquid assets comprise of Cash, CRR, Inter-bank-deposits and Investments. Different liquid asset ratios are arrived at using various definitions under the baseline scenario. The stress scenarios are constructed to test the ability of banks to meet a run on their deposits using only their liquid assets. It is assumed that (1) ten per cent total deposits would be withdrawn in 10 days and (2) three per cent deposits would be withdrawn in each day for 5 days. Under the stress scenarios, there were indications of deterioration in the liquidity position of banks though SLR investments and CRR helped the banks to ward off the liquidity pressure.

Bottom Up Stress Tests

2.56 The results of the bottom up stress tests carried out by select banks also testified to the general resilience of the banks to different kinds of shocks. As in the case of top down stress tests, the impact of the stress tests was relatively more severe on some banks with their stressed CRAR position falling below the regulatory minimum (Chart 2.30).

Chart 2.30: Bottom-up Stress Tests – Credit & Market Risks



Credit Risk: Gross Credit	Shock1	NPAs increase by 100 per cent
	Shock2	30 percent of restructured assets become NPAs
	Shock3	5 percentage points increase in NPAs in each top 5 sector / industry
Credit Risk: Concentration	Shock1	The top three individual borrowers default
	Shock2	The top largest group defaults
	Shock3	Top five industries/ sectors defaults: the borrowers of top five industries/ sectors default
Interest Rate Risk – Banking Book	Shock	Parallel upward shift in INR yield curve by 2.5 percentage points
Interest Rate Risk – Trading Book	Shock	Parallel upward shift in INR yield curve by 2.5 percentage points

Source: Select banks

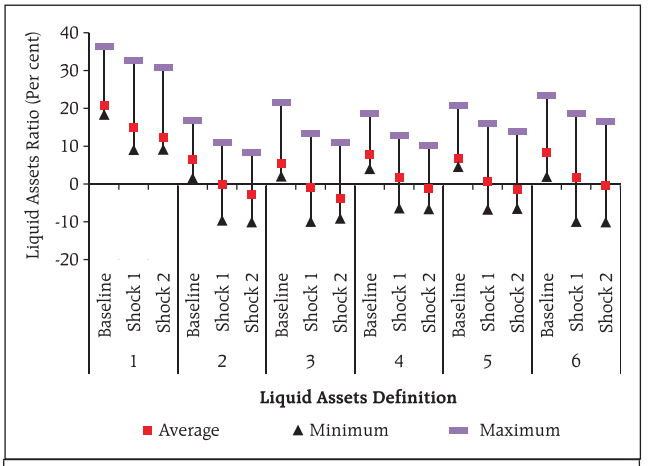
[28] Please refer definitions 1 to 5 given in the footnote of Chart 2.31.

2.57 The results of bottom up stress tests for liquidity risk show significant impact of liquidity shocks on select banks. The results also reflect that SLR investments, and CRR deposits to some extent, helped the banks to sustain against the liquidity pressure from sudden and unexpected withdrawal of deposits by depositors (Chart 2.31).

Derivatives Portfolio of Banks

2.58 The derivatives portfolio of banks in India grew sharply in the years leading up to the global financial crisis. Though the portfolio size has shrunk since 2008, it still remains large with the outstanding notional principal of the derivatives portfolio of banks constituting over 120 per cent of banks' total assets as on March 31, 2013. However, the credit equivalent of derivate portfolio is about 8 per cent of the balance sheet assets. The foreign banks as a group account for about 80 per cent of the outstanding notional principal in the derivatives market, whereas their share in the balance sheet assets of the banking system is only 7 per cent. The size of outstanding notional principal and their credit equivalent for foreign banks is about 1200 and 80 per cent of total assets respectively (Chart 2.32 and 2.33).

Chart 2.31: Bottom-up Stress Tests – Liquidity Risk

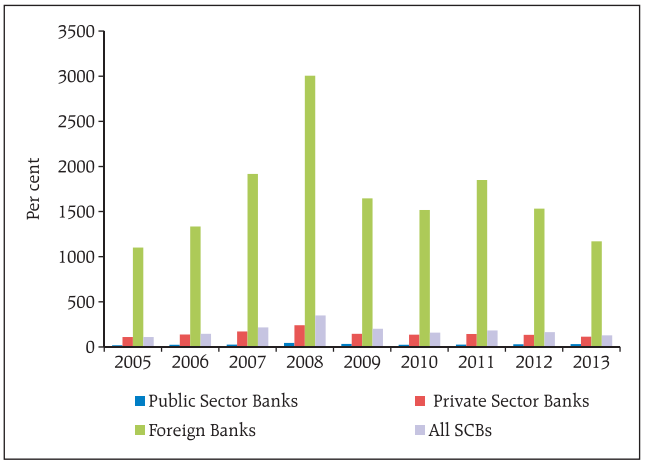


Liquid Assets Definitions	
1	Cash + Excess CRR + Inter Bank Deposits + SLR Investments
2	Cash + Excess CRR + Inter Bank Deposits maturing-within-1-month + Investments maturing-within-1-month
3	Cash + Excess CRR + Inter Bank Deposits maturing-within-1-month + Excess SLR Investments
4	Cash + CRR + Inter Bank Deposits maturing-within-1-month + Investments maturing-within-1-month
5	Cash + CRR + Inter Bank Deposits maturing-within-1-month + Excess SLR Investments
6	Cash + Excess CRR + Inter Bank Deposits + Excess SLR Investments + other investments which the bank consider liquid
Liquidity Shocks	
Shock1	10 percent deposits withdrawal (cumulative) during 30 days period
Shock2	3 percent deposits withdrawal (each day) within 5 days

Source: Select banks

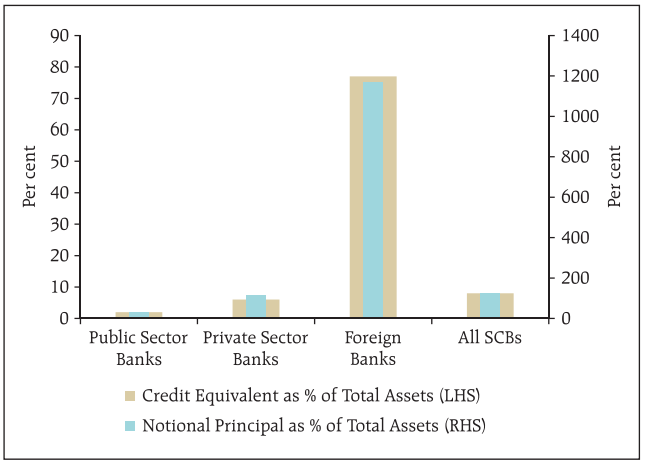
Chart 2.32: Trend in Notional Principal of Total Derivatives

Per cent to Total Assets



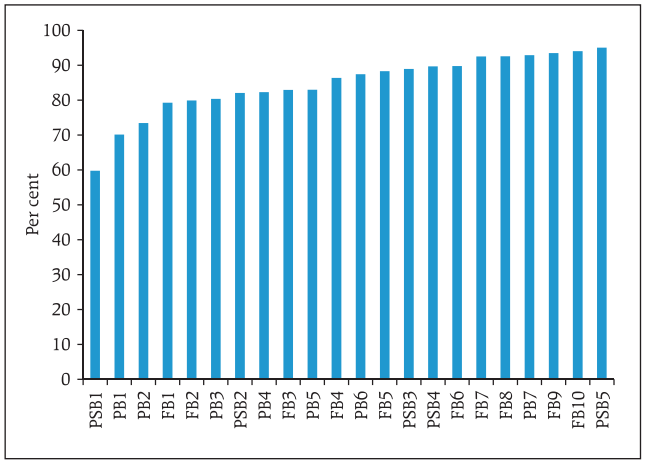
Source: RBI Supervisory Returns

Chart 2.33: Derivatives Portfolio of SCBs – March 2013



Source: RBI Supervisory Returns

Chart 2.34: Share of Inter-bank segment in derivatives transactions – March 2013



PSB: Public Sector Bank, PB: Private Sector Bank, FB: Foreign Bank
Source: Sample banks (Bottom-up stress tests on derivate portfolio)

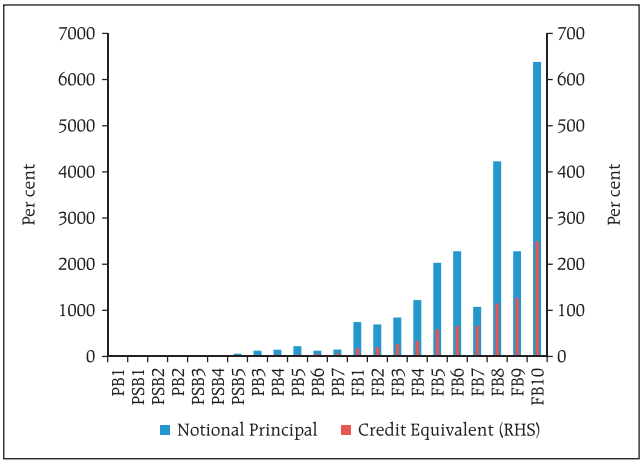
2.59 Among the sample banks[29], the majority of outstanding derivative transactions are interbank transactions. The interbank segment of the derivatives portfolio constituted about 85 per cent of the total outstanding derivatives as at March 2013 (Chart 2.34).

2.60 The credit equivalent of derivative portfolio of public and private sector banks were not very significant. However, the credit equivalent for foreign banks were large (Chart 2.35).

2.61 The mark to market (MTM) value of the derivatives portfolio for the banks in the sample varied – with most banks registering positive net MTM with the exception of a few large negative Net MTM (Chart 2.36).

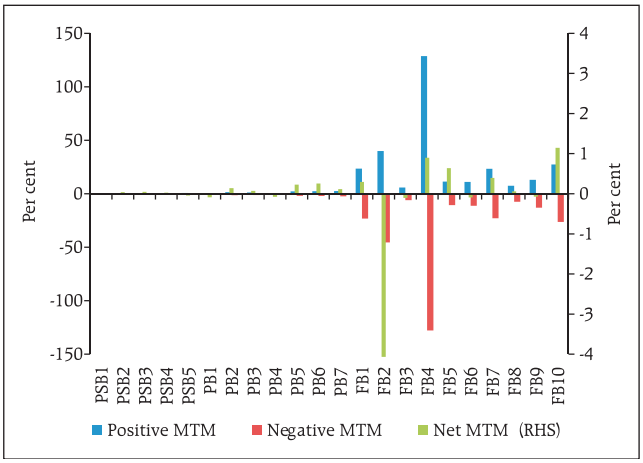
2.62 A series of stress tests (sensitivity analysis) on derivative portfolios were conducted with the reference date as March 31, 2013. The banks in the sample reported the results of four separate shocks on interest rates and foreign exchange rates. The shocks on the interest rates ranged from 1.0 percentage points to 2.5 percentage points, while that for foreign exchange rates was kept at 20 per cent. The stress tests were carried out on individual shocks, on stand-alone basis. The results showed that the average net impacts of shocks on sample banks were not very high (Chart 2.37).

Chart 2.35: Credit Equivalent of Derivatives Portfolio – March 2013
(Per cent to Total Balance-sheet Assets)



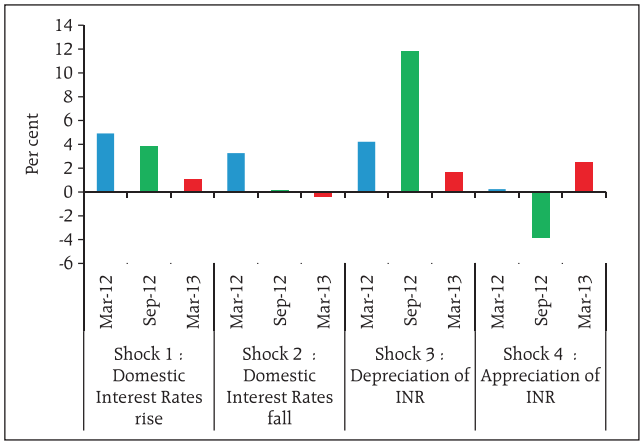
PSB: Public Sector Bank, PB: Private Sector Bank, FB: Foreign Bank
Source: Sample banks (Bottom-up stress tests on derivate portfolio)

Chart 2.36: MTM of Total Derivatives
(Per cent to Total Assets)



PSB: Public Sector Bank, PB: Private Sector Bank, FB: Foreign Bank
Source: Sample banks (Bottom-up stress tests on derivate portfolio)

Chart 2.37: Stress Tests - Impact of shocks on Derivatives Portfolio of Select Banks (Change in net MTM on application of a shock)
(Per cent to capital funds)



Source: Sample banks (Bottom-up stress tests on derivate portfolio)

[29] Stress tests on derivatives portfolios were conducted for a sample of 22 select banks. Details are in Annex-2.

Scheduled Urban Co-operative Banks (SUCBs)

2.63 The CRAR of SUCBs has remained at 12.7 per cent as at end March 2013, whereas, GNPA ratio declined to 5.3 per cent as at end March 2013 from 6.1 per cent in September 2012. The annualised return on assets (RoA) declined from 1.1 per cent in the quarter ended September 2012 to 0.9 per cent in the quarter ended March 2013. The Liquidity Ratio for the SUCBs declined marginally to 34.0 per cent in March 2013 from 34.1 per cent in September 2012. However, the Provision Coverage Ratio (PCR) of SUCBs improved to 73.7 per cent in March 2013 from 66.3 per cent in September 2012 (Table 2.8).

2.64 Stress tests for assessment of credit risk were carried out for SUCBs using the data as on March 31, 2013. The impact of credit risk shocks on the CRAR of the SUCBs was observed under two different scenarios assuming an increase in the gross NPA ratio by 50 per cent and 100 per cent respectively. The results show that SUCBs could withstand shocks assumed under the first scenario easily, though they would come under some stress under the second scenario (Chart 2.38).

2.65 Stress tests on liquidity risk were carried out under two different scenarios assuming increase in cash outflows in the 1 to 28 days time bucket by 50 per cent and 100 per cent respectively. It was further assumed that there was no change in cash inflows under both the scenarios. The SUCBs would be impacted as a result of the stress if the mismatch or negative gap (*i.e.* the cash inflow being less than the cash outflow) in the 1 to 28 days time bucket exceeds 20 per cent of outflows. The stress test results indicate that the SUCBs would be significantly impacted even under the less severe stress scenario (Chart 2.39).

Table 2.8 Select Financial Soundness Indicators of SUCBs

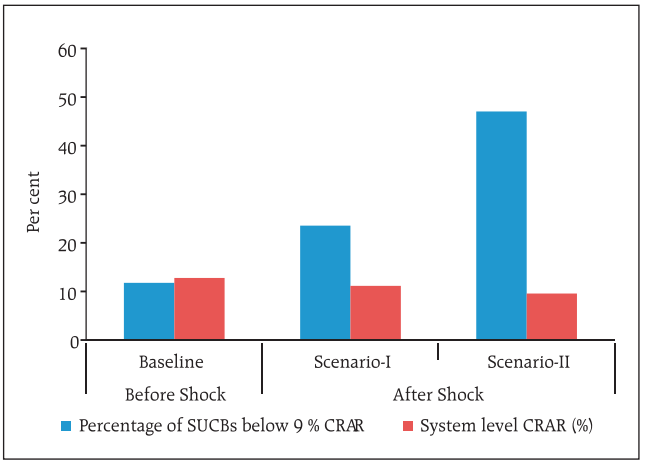
(Per cent)

Financial Soundness Indicators	Sep-12	Mar-13
1. CRAR	12.7	12.7
2. Gross NPAs to Gross Advances	6.1	5.3
3. Return on Assets (annualized)	1.1	0.9
4. Liquidity Ratio	34.1	34.0
5. Provision Coverage Ratio	66.3	73.7

Note: 1. Data are provisional and based on OSS Returns.
2. Liquidity Ratio = 100 * (Cash + due from banks + SLR investment) / Total Assets.
3. PCR = NPA provisions held as per cent of Gross NPAs.

Source: RBI Supervisory Returns and Staff Calculations

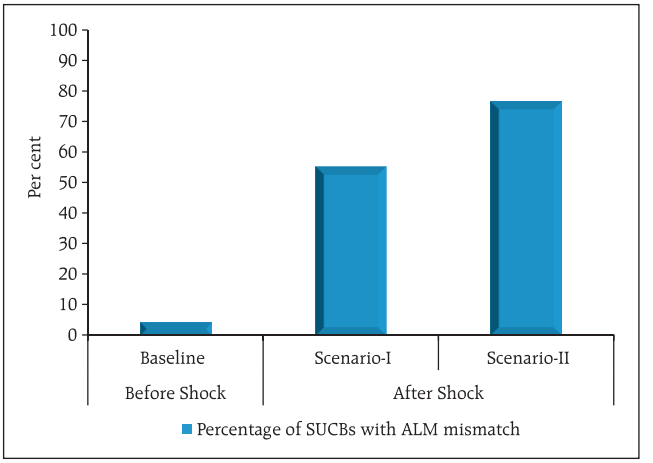
Chart 2.38: Impact of Shocks on Capital Position – SUCBs – March 2013



Note : An SUCB is considered impacted if its CRAR falls below 9 per cent

Source: RBI Supervisory Returns and Staff Calculations

Chart 2.39: Impact of Liquidity Shocks – SUCBs – March 2013



Source: RBI Supervisory Returns and Staff Calculations

Non-Banking Financial Companies (NBFCs)

2.66 The NBFCs sector under Reserve Bank's regulation is dominated by non-deposit taking systemically important NBFCs (NBFC-ND-SIs), which account for around 90 per cent of the sector in terms of asset size.

Capital Adequacy

2.67 The CRAR norms were made applicable to NBFCs-ND-SI w.e.f April, 2007[30], in terms of which every systemically important non-deposit taking NBFC is required to maintain a minimum capital, consisting of Tier-I and Tier- II capital, of not less than 15 per cent of its aggregate risk-weighted assets. The aggregate CRAR of the NBFCs-ND-SI sector stood at 26.8 per cent for the quarter ended December 2012 (27.4 per cent in the previous quarter ended September 2012) (Chart 2.40).

Asset Quality

2.68 The GNPA ratio of the NBFCs-ND-SI sector stood at 3.2 per cent for the quarter ended December 2012 as against 2.5 per cent for the same quarter in the preceding year. Trends in GNPA ratio is given in Chart 2.41.

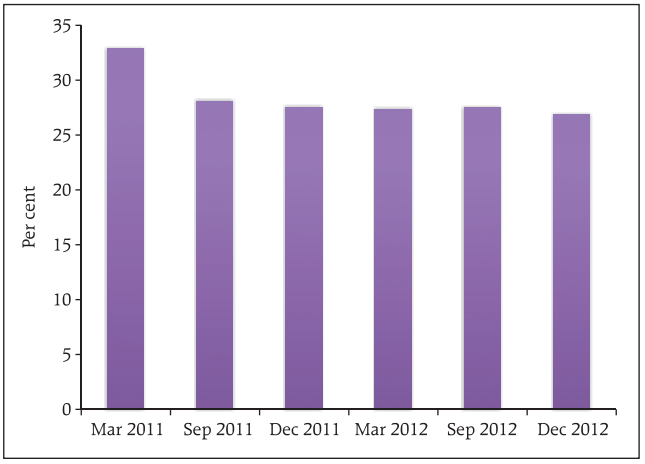
Profitability

2.69 The ROAs (net profit as a percentage of total assets) of the NBFCs-ND-SI sector stood at 2.1 per cent for the quarter ended December 2012 as compared with 1.8 per cent for the same quarter in the previous year (Chart 2.42).

Real Estate Exposure

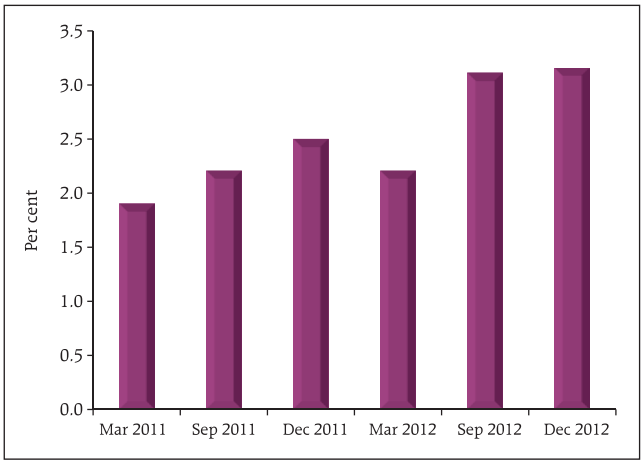
2.70 Advances of NBFCs-ND-SI to real estate sector on an average accounted for 4.5 per cent of total advances to this sector. Trends in advances to real estate sector in absolute terms are furnished in Chart 2.43.

Chart 2.40: Trends in Capital to Risk Weighted Assets Ratio



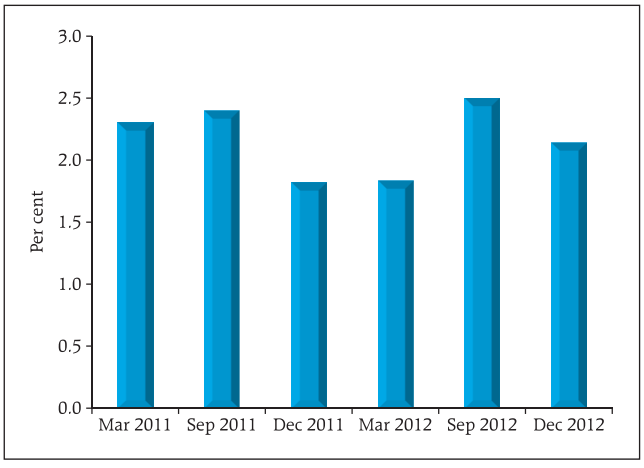
Source: RBI Supervisory Returns

Chart 2.41: Trends in Gross NPA Ratio



Source: RBI Supervisory Returns

Chart 2.42: Trends in Return on Assets



Source: RBI Supervisory Returns

[30] Vide Notification No. DNBS.193 DG (VL) 2007, dated 22-02-2007

Capital Market Exposure (CME)

2.71 Capital market exposure includes (i) investments in listed instruments and (ii) advances to capital market related activities. CME of the NBFCs-ND-SI sector on an average accounted for 8.8 per cent of total assets of the sector, while CME to own funds of the sector accounted for 34.0 per cent (Chart 2.44).

Stress Tests - Credit Risk

System level (NBFC-D and NBFC-ND-SI)

2.72 Stress tests on credit risk for NBFCs (includes both deposit taking and ND-SI sectors) for the period ended December 2012 were carried out under two scenarios (i) where gross NPA increased two times and (ii) gross NPA increased 5 times from the current level. It was observed that in the first scenario, CRAR dropped by 1.1 percentage points from 21.7 per cent to 20.6 per cent while in the second scenario CRAR dropped by 4.4 percentage points (CRAR dropped from 21.7 per cent to 17.3 per cent). It may be concluded that even though there will be a decline in CRAR under both the scenarios, it will remain above the minimum required level of 15 per cent.

Select NBFCs

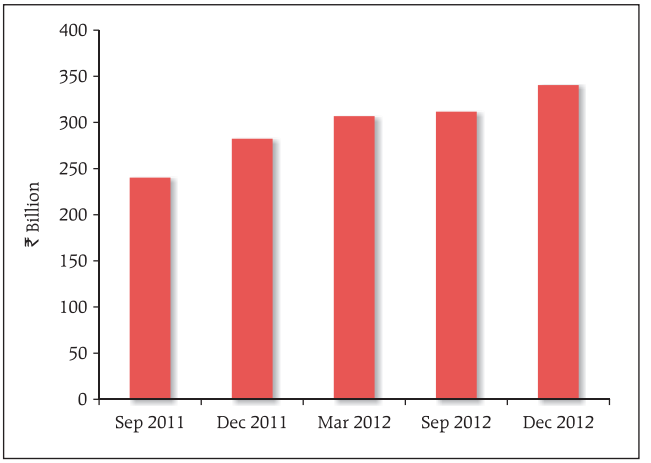
2.73 Stress tests on credit risk for individual NBFCs for the period ended December 2012 was also carried out under the same scenarios as used for system level stress tests. Under the first scenario, it was observed that CRAR in respect of 3.5 per cent companies was less than minimum regulatory requirement of 15 per cent while in the second scenario, CRAR in respect of 8.9 per cent companies went under 15 per cent.

Insurance

Soundness

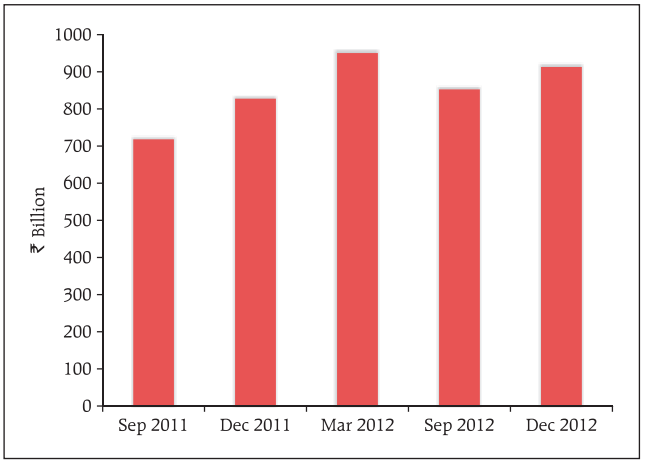
2.74 The soundness of insurance companies is indicated by solvency ratio. During the first three quarters of the financial year 2012-13, the life and non-life insurance companies comfortably maintained the minimum required solvency ratios of 1.5 and 1.3, respectively.

Chart 2.43: Trends in Advances to Real Estate Sector



Source: RBI Supervisory Returns

Chart 2.44: Trends in Exposure to Capital Market



Source: RBI Supervisory Returns

Business operations

2.75 The total premium collected by life insurance companies during the first three quarters of 2012-13 was ₹1.80 trillion out of which LIC accounted 71.9 per cent. During the same period, total premium collected by non life insurance companies (excluding GIC) was ₹513.88 billion, out of which 52.5 per cent was contributed by the four companies in the public sector.

Life Insurance

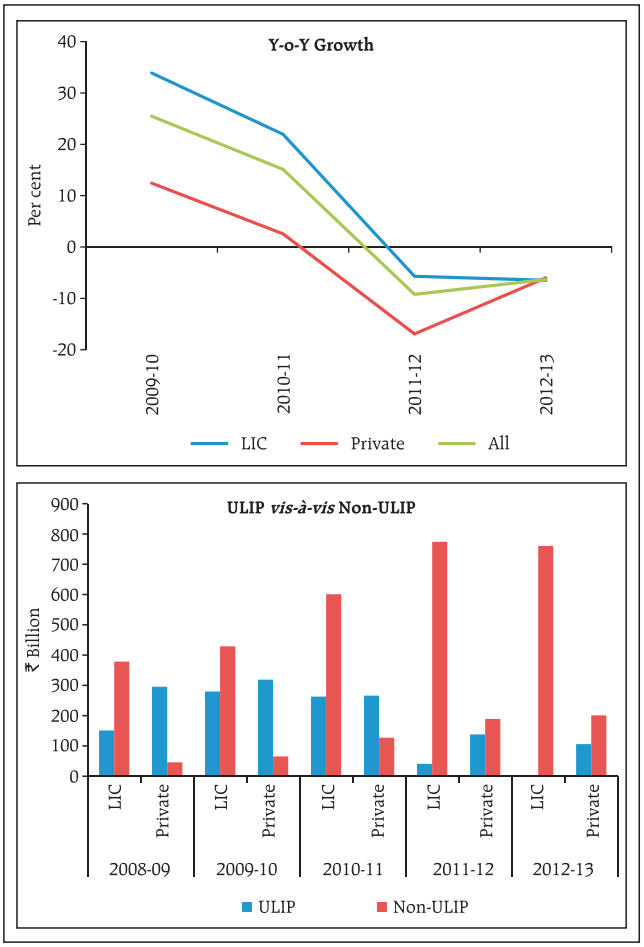
2.76 The business of the life insurance sector, measured in terms of new business premium continued to contract for the last two years. The new business premium contracted by 6.3 per cent on y-o-y basis in the FY: 2012-13 (Chart 2.45). This contraction was observed in both public (*i.e.* Life Insurance Corporation of India (LIC)) and private sectors. The profitability of the life insurance companies had also declined during the first three quarters of 2012-13 from the previous year. A major shift in the sector has been the move away from ULIP products, which is especially evident in the private sector.

Single Premium Policies

2.77 A major part of the new business premium of LIC is from single premium policies, hovering around 60 per cent of the total premium. Since 2010 -11, private insurers have also expanded their single premium business to about 30 per cent of the total. Overall contribution of single premium business for the life insurance sector increased to 51.4 per cent during 2012-13 from 45.2 per cent of the previous year (Chart 2.46).

2.78 From Chart 2.46, it can be observed that the number of single premium policies sold is declining with increase in premium indicating rising ticket size of single premium policies.

Chart 2.45: New Business Premium



Source: IRDA

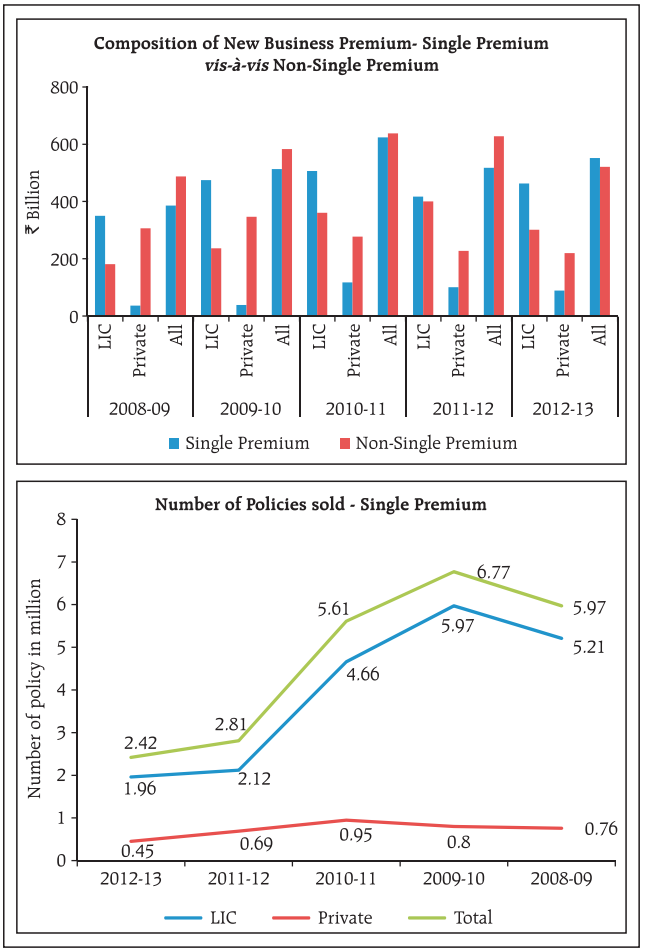
Persistency

2.79 Life insurance policies being long term in nature, it is necessary to put in place measures to ensure that they remain in force throughout their life. Persistency[31] of life policies is, however, a problem globally due to the following issues i) during the life of the policy, there might be better products with more beneficial features available in the market, or *ab initio* the product was not appropriate to the insured's requirements over the lifetime; ii) extraneous factors like change in the policyholder's economic profile, job, *etc.*, and iii) poor after- sales service due to attrition of agents, *etc.*, IRDA has been initiating measures to improve the persistency in the Indian life insurance market, especially for post sales service of orphan policies. This has resulted in some improvement.

Pension Fund

2.80 The New Pension System (NPS) introduced by the Government of India with a view to develop the pension sector, is mandatory for all new recruits to the Government (except armed forces) with effect from January 1, 2004 and has also been rolled out to all citizens with effect from May 1, 2009 on a voluntary basis. During March 2010 and March 2013 the subscriber base of NPS grew by 522.9 per cent, whereas, the corpus increased by 538.0 per cent, indicating a steep growth pattern in the subscriber base and corpus during the short time (Table 2.9).

Chart 2.46: Composition of New Business Premium- Single Premium *vis-à-vis* Non-Single Premium



Source: IRDA

Table 2.9: Developments in New Pension System

	Number of Subscribers (in Lakhs)				Assets Under Management (in Crores)				Growth of Mar-13 over Mar-10 (%)	
	Mar-10	Mar-11	Mar-12	Mar-13	Mar-10	Mar-11	Mar-12	Mar-13	No of Subcribers	AUM
Central Government	5.96	7.48	9.47	11.40	4,484.04	7,266.39	11,341.43	17,576.00	91.15	291.97
State Government	1.79	5.83	11.44	16.26	185.64	1,203.95	3,420.42	10,489.00	806.22	5,550.18
NPS Main-Private Sector	0.04	0.36	0.74	2.13	9.52	111.26	260.93	1,351.00	5,042.44	14,091.18
NPS Lite		4.86	9.69	18.79	-	3.13	140.46	436.00	-	-
Total	**7.80**	**18.53**	**31.34**	**48.58**	**4,679.20**	**8,584.73**	**15,163.24**	**29,852.00**	**522.85**	**537.97**

- : Not Available.
Source: PFRDA

[31] Percentage of an insurance company's already written policies remaining in force, without lapsing or being replaced by policies of other insurers.

2.81 The fast growing subscriber base and corpus have been accompanied with notable returns. The weighted average return as on March 31, 2013 calculated on the basis of Net Asset Value of the NPS Schemes was in the range of 8.4 per cent to 14.2 per cent (Table 2.10).

2.82 The 2013-14 budget estimated a total outflow of ₹707.26 billion on pensions of central government employees alone, which is an increase of 10.79 per cent over the revised estimate of ₹638.36 billion for 2012-13. The outflows are expected to rise as the cohort of recruits between 1970s and 1980s retire. In the case of several Defined Benefit (DB) schemes, currently under implementation and newly announced (mostly in the government sector), the lack of liability computation especially in a world of rising life expectancy can be a potential source of fiscal stress in years when there are large payouts.

Table 2.10: Weighted Average Returns on Pension Funds

Scheme	**Returns** (Per cent)
Central Government	12.39
State Government	13.00
Swavalamban	13.40
Private: Equity	8.38
Private: Corporate Debt	14.19
Private: Government Debt	13.52

Source: PFRDA

Chapter III

Financial Sector Regulation and Infrastructure

The progress in the implementation of various reforms in different countries is likely to be guided as much by legacy issues as by a mix of factors such as the stage of financial sector development on the one hand and relative significance and priorities of various reforms for the respective economic systems on the other. In the interim, there is a risk that emerging inconsistencies in regulatory approach in some of the major jurisdictions may create hurdles to the smooth functioning of international financial markets and institutions. In any case, regulatory dialectics are expected to continue as new regulatory gaps emerge.

India has made steady progress in implementation of the G20/ Financial Stability Board (FSB) led global reforms, in various areas viz. Basel – III, OTC derivatives, regulation of systemically important financial institutions, shadow banking sector etc. While staying committed to the reforms agenda, India is conscious of the pitfalls of the 'one size fits all' approach to regulation. Furthermore, it is important to take cognizance of the historical evolution and unique characterisitics of the financial system, while reviewing the legal-regulatory framework for the Indian financial sector.

The recent episodes of some unhealthy practices in the shadow banking sector have underlined the importance of extending the regulatory perimeter and strengthening the supervisory functions. That brings forth the need for enhancing the effectiveness of coordination mechanism with law enforcement agencies to ensure a higher degree of consumer protection in financial sector.

At a time when efforts are on to augment the household financial savings, it is important to enhance the credibility of the financial system by addressing the risks posed by mis-selling of financial products, perverse incentive practices, risks from the technology issues such as erroneous trades, high frequency trading, card / electronic payment transactions etc.

Implementation of Global Regulatory Reforms

Regulatory Dialectics

3.1 Implementation of agreed global reforms is underway in various jurisdictions even as there is a parallel process of rethinking on the architecture of financial regulation. Excessive deregulation and soft touch regulations were among the main factors that contributed to the financial crisis which the reforms intended to address. However, as memories of the crisis are fading, questions are being raised over the proposed measures for reregulation. The rethinking on the reforms veers around the relative benefits of increased capital levels (especially of 'too big to fail' entities) versus the development of the financial markets and the costs of banking business. While the regulatory dialectics will continue, regulators may find it difficult to steer their reforms through such trade-offs (Box 3.1).

Signs of Home-bias in Regulation

3.2 While considerable progress has been achieved in building global consensus on reforms, regulatory chauvinism has been raising its head in certain jurisdictions. The divergent approaches to additional regulatory measures in many advanced jurisdictions might lead to slowdown in financial globalisation. For example, the main proposals under the Volker rules in the US, Vickers report in the UK and Liikanen report in the EU, are essentially based on ring-fencing models. However, there are some important differences in terms of the range of activities that can be undertaken by and between the ring-fenced entities. While the relative merits and de-merits of a home-bias to regulation might be difficult to gauge at this juncture, there are some immediate possible effects of such regulations, such as the Volcker Rule prescriptions affecting the operations of the US banks

Box 3.1: Regulation, Innovation and Regulatory Dialectics

More than three decades ago Edward J. Kane put forth the idea of a dynamic model depicting the interaction between the regulated and the regulators and called it "regulatory dialectics". Under this model, financial market regulation is an endless process with both the regulator and the regulated making alternative moves. Interestingly, way back in the eighties Kane has suggested the following order in which the financial market players in the dialectics model exhibit their average adaptive efficiencies, and concluded that the lag between regulation and avoidance is shorter than the lag between avoidance and regulation.

- Less regulated players move faster and more freely than the more regulated ones
- Private players move faster and more freely than governmental ones
- Regulated players move faster than the regulators
- International regulatory bodies move more slowly and less freely than all other players

In a recent paper[1] Kane opined that "In the US, strategies for dealing with regulation-induced innovation and for disciplining the institutions that recklessly spawned these plagues have been assigned to teams of incentive conflicted and understaffed regulators to work out" and that "Bankers understand the financial safety net as a politically enforceable implicit contract that they have negotiated with their national governments" and "not as something external to their balance sheets". He further feels that "lobbyists create a taxpayer put by creating an excessive fear in the minds of regulators of letting banks' accounting decisions or health be called into question"[2]

in India as they are major players in domestic foreign exchange, government securities and interest rate swap markets.

Indian Approach to Implementation of Reforms

3.3 Domestic factors and policy priorities have continued to guide the Indian approach to financial sector regulation, while adhering to the commitment to implement the agreed global reforms and international standards. The Financial Stability and Development Council (FSDC), through its Sub Committee is coordinating and monitoring the implementation of various reforms, starting with an assessment of extant regulatory framework in the country *vis-à-vis* the proposed reforms. The reforms directly related to and contained within the regulatory purview of the individual sectoral regulators are being handled independently by them; reform areas which need active inter-regulatory/inter agency coordination are being spearheaded by the inter-agency implementation groups focussing on specific areas, *viz.* resolution regime, shadow banking, financial market infrastructure, legal entity identifier, and credit rating agencies. A roadmap indicating the timelines for implementation of these reforms is proposed to be set out by the respective groups.

Basel – III

Effect of Risk Weight Based Approach

3.4 Basel III aims to address the shortcomings in the Basel-II framework, which surfaced during the global financial crisis. One of the main factors for the crisis was the build-up of excessive leverage while maintaining the risk based capital ratio above the regulatory requirement, as some of the banks' internal models facilitated mathematical maneuvering of risk weights. The inherent complexity and opacity involved in the modelling exercise, notwithstanding

[1] Kane, E (2012) "Bankers and Brokers First: Loose Ends in the Theory of Central-Bank Policymaking", accessed from https://www2.bc.edu/edward-kane/Bankers%20and%20Brokers%20First.pdf

[2] Kane, E (2011), "Loose Ends in Capital Regulation: Facing Up to the Regulatory Dialectic", *presentation at International Banking Conference Federal Reserve Bank of Chicago,* November 11, 2011, Chicago

the scrutiny and supervisory validation process, allowed the banks to indulge in aggressive application of risk weights, driven mainly by their business considerations.

3.5 A recent paper[3] has found that the risk-weight density defined as ratio of risk-weighted assets (RWAs) to total assets, of banks is observed to be lower once regulatory approval is granted for the internal ratings-based (IRB) approaches of Basel II. It is further noted that the effect persists for different loan categories, which cannot be explained by flawed modelling or improved risk-measurement alone. These observations have resulted in the additional regulatory prescriptions under Basel III, wherein common equity requirements have not only been more than doubled but also are required to be topped up with capital conservation buffer[4].

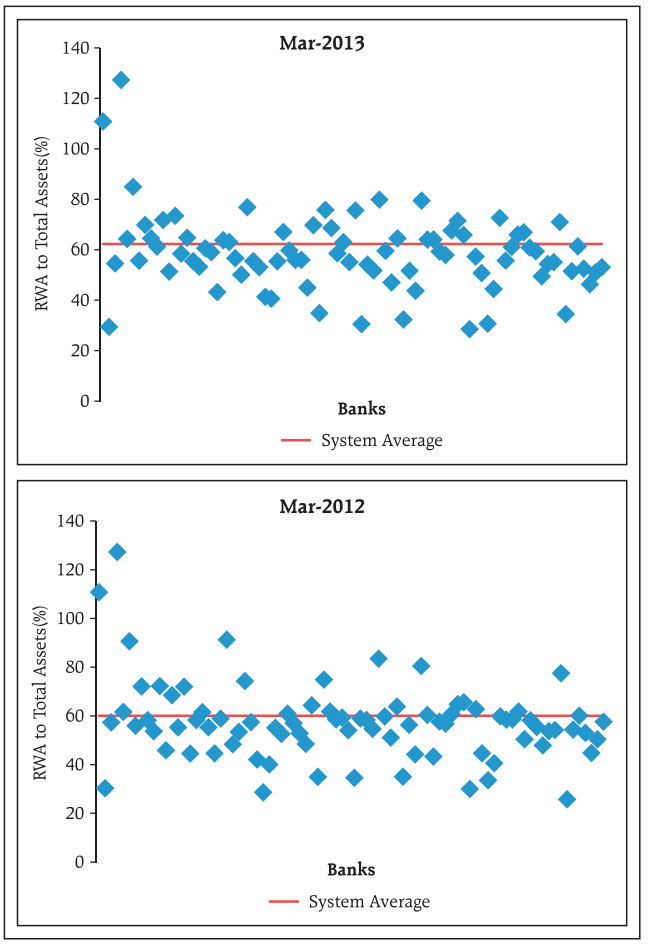
Marginal Increase in RWAs for Indian Banks

3.6 The scatter diagrams of ratio of RWA to total assets[5] of Indian banks show that the average value of the ratio has increased from 60 per cent as at end March 2012 to 62 per cent as at end March 2013 (Chart 3.1). The dispersion in ratio values has also decreased marginally between these two dates. The trends and outliers need to be monitored as more and more banks adopt the internal model based approaches under Basel II and Basel III[6].

Leverage Ratio – 'Back to Basics'

3.7 In order to arrest the tendency to build up excessive leverage, a simple non-risk based leverage ratio has been prescribed under Basel II, which will act as a complementary 'backstop' measure to the risk-based capital requirements. The leverage ratio can be easily understood by all the stakeholders of a

Chart 3.1: RWA Density



Source: RBI Supervisory returns and staff calculations

[3] Maristhasan, M and O, Merrouche (2013), "The Manipulation of Basel Risk-Weights", *CEPR Discussion Paper* -9494, CEPR

[4] Additional capital in the form of a buffer, equivalent to 2.5 per cent of the risk weighted assets, to be drawn down in periods of stress

[5] On-balance sheet assets as well as off-balance sheet assets have been used for calculation.

[6] Section 2.29 of Chapter II of this Report may also be seen.

bank, *viz.*, shareholders, creditors, depositors and regulators and facilitates easier assessment of the capital adequacy of the institution. The Basel Committee is testing the Tier I leverage ratio during the parallel run period from January 1, 2013 to January 1, 2017.

Revised Basel III Guidelines on Short Term Liquidity

3.8 In January 2013, the Basel Committee on Banking Supervision (BCBS) issued the revised guidelines[7] on Liquidity Coverage Ratio (LCR)[8] after incorporating a number of changes in the original version published in December 2010 (Box 3.2). The changes were necessitated to minimise the potential impact of the LCR standard on the financial markets, extension of credit and economic growth. Also, the BCBS has considered a broader timeframe for the introduction of the LCR standard, in view of the significant financial strains persisting in some banking systems.

Reserve Bank's Guidelines on Liquidity Norms

3.9 The Reserve Bank indicated in the guidelines on liquidity risk management issued in November 2012, that the final guidelines on Basel III liquidity standards will be issued once the Basel Committee finalises the relevant framework. The Basel Committee has since issued the guidelines (Basel III: The Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools) in January 2013 and is in the process of finalising the LCR disclosure requirements and the Net Stable Funding Ratio (NSFR)[9]. The Reserve Bank will issue the final guidelines on Basel III liquidity standards and liquidity risk monitoring tools, taking into account the revisions by the Basel Committee. While the enhanced liquidity risk management measures are expected to be implemented by banks immediately, the Basel III liquidity standards, *viz.*, LCR and NSFR, will be binding on banks from January 1, 2015 and January 1, 2018, respectively.

Box 3.2: Major Changes Announced in the LCR Guidelines

Expansion of the range of eligible assets as part of high-quality liquid assets (HQLA) - through the addition of a new category of Level 2B assets which national supervisors may choose to recognise as HQLA in their local LCR regulations.

Recalibration of the stress assumptions for some cash-flow items (including in respect of retail and non-financial corporate deposits and undrawn committed facilities), taking into account industry feedback and actual experience in times of stress.

Affirmation of the usability of the stock of HQLA by banks in times of stress, allowing the LCR to fall below the minimum requirement. Supervisors will need to establish guidance to specify the circumstances for usage of the HQLA, and to ensure appropriate supervisory action in response to such circumstances; and

Adoption of a phase-in arrangement that introduces the LCR as planned on January 1, 2015, but with the minimum requirement set at 60 per cent. This will then rise by 10 percentage points per annum to reach 100 per cent on January 1, 2019. This graduated approach is to ensure that the standard can be implemented without material disruption to the ongoing strengthening of banking systems and financing of economic activity.

[7] Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools, January 2013, http://www.bis.org/publ/bcbs238.pdf

[8] The LCR, expressed as a ratio of "Stock of high-quality liquid assets" to "Total net cash outflows over the next 30 calendar days", is one of the two global liquidity standards which form an essential component of the Basel III guidelines. The objective of LCR is to ensure the short-term resilience of banks through an adequate stock of unencumbered high-quality liquid assets to meet contingent liquidity needs for 30 calendar days under an acute liquidity stress scenario.

[9] The NSFR standard is structured to ensure that long term assets are funded with at least a minimum amount of stable liabilities in relation to their liquidity risk profiles.

More Stringent Capital Requirements and Timelines

3.10 The Reserve Bank of India has already introduced Basel III capital regulations, effective April 1, 2013, to be implemented in a phased manner over a period of time ending March 31, 2018. Thus India's schedule for full implementation is nine months ahead of Basel committee's deadline. As a matter of prudence and also to preempt the possibility of the judgemental errors in computing capital adequacy, the Reserve Bank has prescribed a higher minimum Tier I capital, which is one full percentage point above the Basel III requirements (Table 3.1). Pending finalisation of leverage ratio by the BCBS, the Reserve Bank has introduced a minimum Tier I leverage ratio of 4.5 per cent (Tier I capital to total assets ratio), which will be reviewed later based on the final recommendations by the BCBS.

Table 3.1: Capital requirements for Indian banks under Basel III

(as percent of RWAs)

	Basel III standards	RBI prescriptions
Minimum common equity (MCE)	4.5	5.5
Capital conservation buffer (CCB)	2.5	2.5
Total (MCE+CCB)	7.0	8.0
Minimum Tier I Capital	6.0	7.0
Minimum Tier I Capital + CCB	8.5	9.5
Minimum Total Capital	8.0	9.0
Minimum Total Capital + CCB	10.5	11.5

Additional Capital Requirements

3.11 Analytical studies[10] have indicated the likely adverse impact on lending (and growth) due to the higher capital requirements for banks, at the global level. However, the burden from the increase in cost of lending is expected to be offset by the benefits accruing from a more robust banking system. The improved capital ratios of banks are expected to instill more trust among the stakeholders, thereby reducing their cost of capital over a period of time.

3.12 It is expected that the long timeframe to phase in Basel III capital requirements will allow Indian banks to make a smooth and non-disruptive transition. Initial estimates indicate that the additional capital requirements of Indian banks would be to the order of ₹5 trillion, of which non-equity capital will be to the tune of ₹3.25 trillion with the rest to come from equity.[11]

[10] Macroeconomic Assessment Group (2010), "Assessing the Macroeconomic Impact of the Transition to Stronger Capital and Liquidity Requirements", *Final Report of the Group established by the Financial Stability Board and the Basel Committee on Banking Supervision*, Bank of International Settlements.

[11] Subbarao, D (2013), "The Global Financial Crisis and the Indian Financial Sector What Have We Learnt and How Have We Responded?", *Address at the 7th International Banking & Finance Conference 2013 organised by the Indian Merchants' Chamber*, Mumbai, June 5, 2013

Foreign Banks' Presence in India - Subsidiary Structure

3.13 Traditionally Indian approach to financial regulation has been on combining global experience and local circumstances. As regards the global mega banking institutions, 'too complex to regulate' had been a concern for Indian regulators in respect of their Indian operations. The road map laid down by the Reserve Bank in 2005 allowed foreign banks the choice of entering India either as a branch or a subsidiary. Reflecting the post crisis shift in global policy thinking, the current stance of the Reserve Bank is in favour of subsidiarisation model. While some tax related issues such as exemption from stamp duty and capital gains tax-subsequent to the conversion of branches into subsidiaries, have been addressed; certain legal issues are still being resolved.

Operational Risk under Advanced Measurement Approach

3.14 The previous FSR had raised concerns about the difficulties in measuring operational risks and limitations of the standardised approaches. The Advanced Measurement Approach (AMA) for computing capital charge for operational risks is the most risk-sensitive and sophisticated among the three approaches prescribed under the Basel II.

3.15 The Reserve Bank had issued guidelines on AMA in April 2011 and Indian banks could apply for migration to AMA with effect from April 1, 2012. Four banks have, since, approached the Reserve Bank for permission for migration to AMA. Some major challenges being faced by banks in implementation of AMA approaches relate to issues of internal governance, difficulties in determining the relevant business environment and internal control factors (BEICFs), constraints on availability of historical loss data, including both internal and external data, scenario data, and modeling and quantification of operational loss data. Regulatory permissions for use of AMA for operational risk capital computation would be considered based on the assessment of the preparedness of banks in this regard.

Over The Counter Derivatives

3.16 The thrust of the post crisis reforms on Over The Counter (OTC) derivatives is towards standardisation of products, central counter party (CCP) based electronic trading platform and reporting of trades through trade repositories (TRs). Opacity of products, excessive bilateral exposures coupled with insufficient collateral and the interconnectedness amongst market participants are the main risks in the OTC derivatives markets, globally. FSB is currently monitoring the progress of implementation of these reforms within the G20 nations.

Status of Implementation in India

3.17 In India, the small size of the OTC derivatives market, low level of complexity in products, orderly development and regulation of market have ensured that there are no major concerns with regard to systemic risks from OTC markets. The OTC derivative products were introduced in a phased manner keeping in view the hedging needs of the real sector. The current regulations mandate that validity of any OTC derivative contract is contingent on one of the parties to the transaction being a regulated entity. The Clearing Corporation of India Limited (CCIL) provides the clearing and settlement of transactions in government securities, money market instruments and foreign exchange products. Reserve Bank, as the regulator of the OTC derivative markets, has focussed on improving transparency and reducing counterparty risk in the OTC derivatives markets and has fostered development of robust market infrastructure for trading, settlement and reporting of transactions. As India is committed to implementation of the G20 / FSB reforms, reasonable progress has been made in implementing the OTC derivative reform measures.

Standardisation of Products

3.18 The process of standardisation of OTC derivative products is planned to be undertaken gradually. Credit Default Swaps (CDS) transactions are standardised in terms of documentation, coupon, coupon payment date *etc.* The standardisation of Interest Rate Swap (IRS) contracts is aimed to be achieved in terms of minimum notional principal amount, tenors, trading hours, settlement calculations etc., in consultation with the market participants. As the first step, standardisation has been made mandatory for INR Mumbai Inter Bank Offer Rate (MIBOR)-Overnight Index Swap (OIS) contracts, from April 1, 2013. Other benchmarks in IRS are proposed to be standardised in subsequent phases. Foreign exchange derivatives are 'plain vanilla' and structures go by market convention.

Centralised Clearing of Foreign Exchange and Interest Rate Forward Trades

3.19 There is a guaranteed centralised clearing arrangement for settlement of USD-INR forward transactions. Mandatory central clearing of foreign exchange forwards is proposed to be introduced shortly. The IRS and Forward Rate Agreements (FRA) in the Indian rupee, which form the bulk of interest rate derivative transactions in the market, are currently being centrally cleared in a non-guaranteed mode. Although it is not mandatory for market participants to clear their trades through CCP, more than 97 per cent of fund flows in IRS/FRA are being settled through CCIL. The CDS market in India is still developing and it may take more time to achieve the necessary market activity to support central clearing of CDS transactions. The risk management framework and procedural aspects proposed by the CCP and the issues relating to exposure norms for derivative transactions are being examined.

3.20 Electronic platforms are available for transactions involving repos in government securities, IRS, FRA and foreign exchange forwards. The report[12] of a Working Group set up by the Reserve Bank has recommended, among other things, introduction of an electronic swap execution facility for the IRS market under a CCP, which may provide guaranteed settlement of trades executed through the electronic platform. The modalities involved in introducing these features are presently under examination.

3.21 As per existing regulatory guidelines, banks and primary dealers report IRS/FRA and foreign exchange derivative transactions on CCIL reporting platform. All CDS trades (including client trades), by market makers are required to be reported on CCIL's reporting platform. Reporting of all major OTC foreign exchange derivatives to the TR has commenced since July 2012. Also, the reporting of client trades in foreign exchange derivatives, under suitable confidentiality protocols, has commenced from April 2013. Presently, client trades in IRS are being reported by banks to the Reserve Bank and steps are being taken to institute the reporting framework for the client trades in respect of interest rate derivatives.

Risks from Extra Territorial Regulatory Jurisdiction of Regulation

3.22 The US and European laws dealing with OTC derivatives reform have raised concerns over possibilities of extra territorial regulatory jurisdiction leading to regulatory clashes and disruptions for market activity. For instance, European Market Infrastructure Regulation (EMIR) and the Commodity Exchange Act (CEA)-as modified by the Dodd-Frank Act, contain prescriptive rules that may prevent European/US banks from participating in third-country clearing houses that have not applied for recognition by the European Securities and Markets Authority (ESMA) or that are not registered as a derivatives clearing organisation (DCO) as per Commodity Futures Trading Commission (CFTC) regulations. While the discussions are still on, the uncertainty over the inconsistencies between EU and US rules, the process and timeline for equivalence assessments may affect the functioning of international financial markets and

[12] Working Group on Enhancing Liquidity in Government Securities and Interest Rate Derivatives Markets

may have an impact on progress of implementation of G20 reform agenda.

Margins for Non-Centrally Cleared OTC Derivatives

3.23 The international standards on margining for non-centrally cleared OTC derivatives are in the process of being finalised. A Working Group set up by the BCBS and International Organisation of Securities Commission (IOSCO) to develop consistent global standards for margin requirements has submitted its draft report for consultation. One of the key principles being proposed for all covered entities (*i.e.* financial firms and systemically-important non-financial entities) that engage in non-centrally-cleared derivatives is that they must exchange initial and variation margin as appropriate to the counterparty risks posed by such transactions. However, the actual quantum of the margin threshold may have to be left to national discretion to suit the domestic financial markets.

Demand for Collateral

3.24 The improved standards for margin requirements and the shift towards central clearing of standardised OTC derivatives contracts may contribute to a structural increase in the demand for collateral assets. At present there is no evidence or expectation of widespread scarcity of safe assets in global financial markets. However, the temporary supply-demand imbalances and associated price changes are expected to generate powerful incentives for endogenous private sector responses such as broader eligibility criteria for collateral assets in private transactions, increased collateral re-use, collateral transformation *etc.* While such responses may help mitigate any shortage of collateral assets, they could also result in increase in interconnectedness, pro-cyclicality and financial system opacity as well as higher operational, funding and rollover risks. These risks can be addressed by measures such as increased transparency through market disclosure and better regulatory reporting, stress-testing, risk-adjusted deposit insurance, prudential limits on asset encumbrance *etc.*

3.25 Asset encumbrance is very low in Indian banking system due to the fact that the funding of commercial banks in India is largely from unsecured and stable public deposits. Banks are required to maintain a portion of their assets in liquid unencumbered assets including sovereign securities to comply with the Statutory Liquidity Ratio[13] (SLR). A relatively lower use of securitisation also limits the extent of encumbrance.

Legal Entity Identifier System

3.26 The global financial crisis, among other things, underscored the need for establishing a uniform global system for legal entity identification to support aggregation of risk positions and financial data. FSB took up the project on a global Legal Entity Identifier (LEI) system to provide support to the objectives of efficient assessment of micro-prudential and macro-prudential risks. LEI is a form of legal entity aggregation that allows authorities to view and analyse the potential systemic risk arising from OTC derivatives transactions or positions, in one or more products, attributable to a group of legal entities sharing common affiliation. The data attributed to such an LEI group can assist authorities in assessing concentration and contagion risk associated with a group and its counterparties. The LEI system is expected to help facilitation of orderly resolution, containing market abuse and curbing financial fraud, and enabling higher quality and accuracy of financial data overall.

3.27 In January 2013, the global LEI system was formally launched with the establishment of the Regulatory Oversight Committee (ROC). The Reserve Bank has joined the ROC of the global LEI system and has set up a Steering Committee, to carry out a detailed study of the requirements of the project for

[13] Banks in India are required to maintain, at the close of business every day, a prescribed minimum SLR, the ratio of liquid assets (in the form of cash, gold and un-encumbered approved securities) to the Net Demand and Time Liabilities.

India. Apart from the OTC derivatives markets, the LEI system may also help in achieving a more robust credit information system in India.

Systemically Important Financial Institutions

3.28 Regulation and supervision of large and diversified financial institutions referred to as Systemically Important Financial Institutions (SIFIs) have assumed significance considering the system wide damage that their failure could potentially cause. India does not, at present, have any Globally Systemically Important Banks (G-SIBs) figuring in the list of 28 G-SIBs[14]. However, there are banks and other types of financial intermediaries which may not be significant from an international perspective, but could still have an important impact on India's domestic financial system and economy, as compared to non-systemic institutions.

3.29 Recognising the importance of such entities, the FSB and the standard setting bodies are extending the SIFI framework to other systemically important financial institutions, in respective areas. For the banking system, the FSB and BCBS have finalised a principles-based, minimum framework for addressing domestic systemically important banks (D-SIBs) (Box 3.3). According to FSB's proposed timelines, the national authorities should begin to apply requirements to banks identified as D-SIBs in line with the phase-in arrangements for the G-SIB framework, *i.e.* from January 2016.

Consolidated Supervision of Financial Conglomerates in India

3.30 In India such big financial groups are identified as Financial Conglomerates (FCs), on the basis of their significant presence in two or more market segments (Banking, Insurance, Securities, Non-Banking Finance and Pension). In an important step towards a more effective consolidated supervision of the FCs, the four financial sector regulators in India, *viz.* Reserve Bank of India (RBI), Securities and Exchange Board of India (SEBI), Insurance Regulatory and Development Authority (IRDA) and Pension Fund Regulatory and Development Authority (PFRDA), have signed a Memorandum of Understanding (MoU) for co-operation in the field of consolidated supervision and monitoring of FCs.

3.31 An Inter-Regulatory Forum (IRF) has been constituted by the Sub Committee of the FSDC to strengthen the monitoring of FCs. The IRF is structured as a college of domestic supervisors by adopting the lead/principal regulator model, with a mandate to carry out two major functions *viz.* developing supervisory cooperation for effective consolidated supervision of FCs and assessing the risk to systemic stability due to activities of the FCs. The IRF, on a special case basis, may identify one or more 'systemically important financial groups' having 'significant/dominant' presence in one financial market segment and a 'major/substantial' presence in one more market segment for the purpose of inclusion in the FC Monitoring framework. The respective regulators are in the process of devising the criteria for entities under their jurisdictions, considering various indicators.

Cross Border Co-operation in Supervision

3.32 The arrangements for sharing of information for improved cross border banking supervision and cooperation, in respect of internationally active banks, are being formalised through the signing of bilateral Memoranda of Understanding (MoU) by the Reserve bank with overseas supervisory counterparts (as "Home" and "Host" supervisors). This channel assumes greater importance as the cross border operations of Indian banks are expanding. The MoU provides a formal, yet legally non-binding gateway of information between the supervisors on the health of the supervised entities, coordination during on-site examinations and times of crises, while preserving the confidentiality of information shared. The MoU does not override the laws of the land of either supervisor but only tries to build an environment of supervisory cooperation and coordination in complete adherence to such laws. Reserve Bank has executed such MoU with 16 overseas supervisors and proposals

[14] Annex 1 to FSB's Update of group of global systemically important banks (G-SIBs) November 2012

Box 3.3: Extension of SIFI framework to D-SIBs

The principles proposed for D-SIBs[15] focus on the higher loss absorbency (HLA) requirement for D-SIBs.

The 12 principles for D-SIB framework are set out below:

Assessment methodology

Principle 1: National authorities should establish a methodology for assessing the degree to which banks are systemically important in a domestic context.

Principle 2: The assessment methodology for a D-SIB should reflect the potential impact of, or externality imposed by, a bank's failure.

Principle 3: The reference system for assessing the impact of failure of a D-SIB should be the domestic economy.

Principle 4: Home authorities should assess banks for their degree of systemic importance at the consolidated group level, while host authorities should assess subsidiaries in their jurisdictions, consolidated to include any of their own downstream subsidiaries, for their degree of systemic importance.

Principle 5: The impact of a D-SIB's failure on the domestic economy should, in principle, be assessed having regard to bank-specific factors: (a) Size; (b) Interconnectedness; (c) Substitutability/financial institution infrastructure (including considerations related to the concentrated nature of the banking sector); and (d) Complexity (including the additional complexities from cross-border activity). In addition, national authorities can consider other measures/data that would inform these bank-specific indicators within each of the above factors, such as size of the domestic economy.

Principle 6: National authorities should undertake regular assessments of the systemic importance of the banks in their jurisdictions to ensure that their assessment reflects the current state of the relevant financial systems and that the interval between D-SIB assessments not be significantly longer than the G-SIB assessment frequency.

Principle 7: National authorities should publicly disclose information that provides an outline of the methodology employed to assess the systemic importance of banks in their domestic economy.

Higher loss absorbency

Principle 8: National authorities should document the methodologies and considerations used to calibrate the level of HLA that the framework would require for D-SIBs in their jurisdiction. The level of HLA calibrated for D-SIBs should be informed by quantitative methodologies (where available) and country-specific factors without prejudice to the use of supervisory judgment.

Principle 9: The HLA requirement imposed on a bank should be commensurate with the degree of systemic importance, as identified under Principle 5. In the case where there are multiple D-SIB buckets in a jurisdiction, this could imply differentiated levels of HLA between D-SIB buckets.

Principle 10: National authorities should ensure that the application of the G-SIB and D-SIB frameworks is compatible within their jurisdictions. Home authorities should impose HLA framework for dealing with D-SIBs requirements that they c alibrate at the parent and/or consolidated level, and host authorities should impose HLA requirements that they calibrate at the sub-consolidated/subsidiary level. The home authority should test that the parent bank is adequately capitalised on a standalone basis, including cases in which a D-SIB HLA requirement is applied at the subsidiary level. Home authorities should impose the higher of either the D-SIB or G-SIB HLA requirements in the case where the banking group has been identified as a D-SIB in the home jurisdiction as well as a G-SIB.

Principle 11: In cases where the subsidiary of a bank is considered to be a D-SIB by a host authority, home and host authorities should make arrangements to coordinate and cooperate on the appropriate HLA requirement, within the constraints imposed by relevant laws in the host jurisdiction.

Principle 12: The HLA requirement should be met fully by Common Equity Tier 1 (CET1). In addition, national authorities should put in place any additional requirements and other policy measures they consider to be appropriate to address the risks posed by a D-SIB.

[15] A framework for dealing with domestic systemically important banks by BCBS – October 2012

in respect of 28 other overseas supervisors are under discussion.

3.33 There is a need for supervisory emphasis on domestically significant institutions, including banks, especially those having substantial cross-border operations. Supervisory Colleges have been established for two big Indian banks, as part of the efforts to increase the supervisory intensity for such institutions.

Resolution Regime

3.34 The previous FSRs have mentioned about the absence of comprehensive/separate legal-institutional arrangement for resolution of different types of financial sector entities in India. Currently, the resolution of banks is facilitated under the Banking Regulation (BR) Act, 1949 which has provisions for compulsory or voluntary mergers. The work on implementation of reforms on resolution regime has started with an examination of existing legislative arrangements for resolution of various types of financial sector entities (including commercial banks, cooperative banks, insurance companies *etc.*). A Working Group was set up under the direction of the FSDC Sub Committee on a comprehensive resolution regime for all types of financial institutions in India.

Shadow Banking

3.35 Shadow banking entities played a significant role during the global financial crisis, due to their interconnectedness with the rest of the financial system. It is, therefore, imperative to identify and manage any risks that the shadow banking may pose to the rest of the financial system. The FSB led reforms are mainly focused on risks from banks' interactions with other financial institutions, risk from money market mutual funds (MMMFs), securitisation, and securities lending and repos.

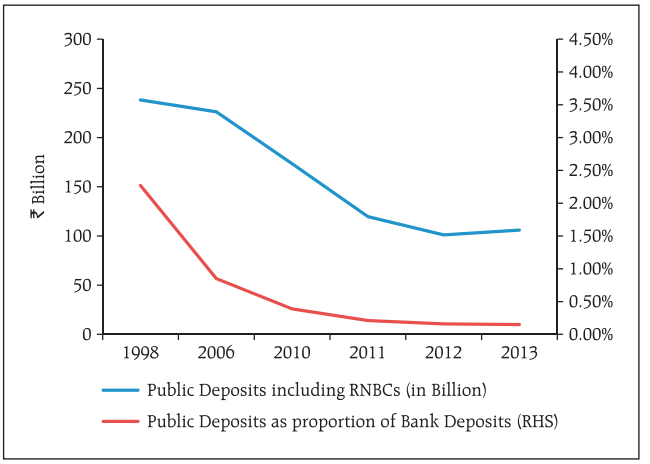
Role of shadow banking in India

3.36 The reach of the banking sector to efficiently cater to all segments of population in far flung areas is limited and to some extent entities in non-bank sector have been filling this gap. Some parts of this non-bank sector [such as the Non-Banking Finance Companies (NBFCs) under the regulation of the Reserve Bank] are regulated in India, although less tightly than the banking system. However, a large part of the non-bank sector exists in the form of unincorporated entities which may be considered as part of shadow banking system, going by the spirit of FSB definition. In the light of their useful economic function, especially in countries like India where financial inclusion is a national priority, there is need for a different approach to regulation of such non-bank entities, while pursuing the objective of consumer protection alongside that of financial stability.

Deposit Taking and Other Systemically Important NBFCs

3.37 The regulatory focus of RBI has primarily been on protection of depositors' interest, and hence on deposit taking NBFCs (referred as NBFC-D). The regulatory measures over time, especially since 1997-98 have resulted in consolidation of the NBFC sector reflecting in a reduction in the number of deposit taking NBFCs. The quantum of the public deposits of NBFCs absolute terms as well as in terms of proportion of the bank deposits has also decreased substantially (Chart 3.2). As many NBFCs stopped their deposit taking activities, the scale of operations of non-deposit

Chart 3.2: Public Deposits of NBFCs[16]

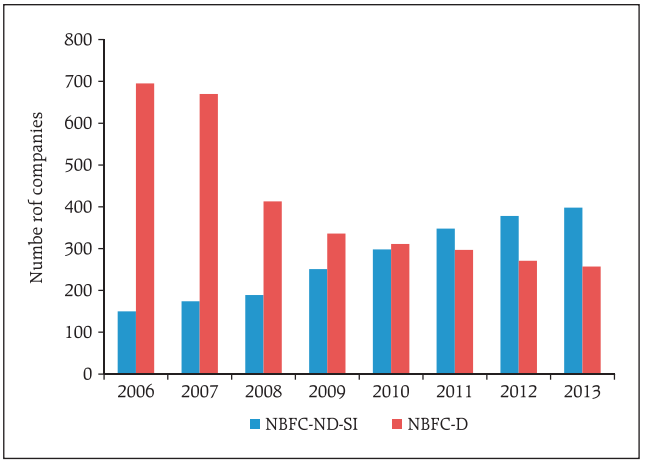


Source: RBI Supervisory Returns

[16] Public deposits of NBFC-D and Residuary Non-Banking Companies (RNBCs) are included. RNBCs belong to a separate class of NBFCs, and have as their principal business, the receiving of deposits, under any scheme or arrangement or in any other manner *and not* being Investment, Asset Financing, Loan Company.

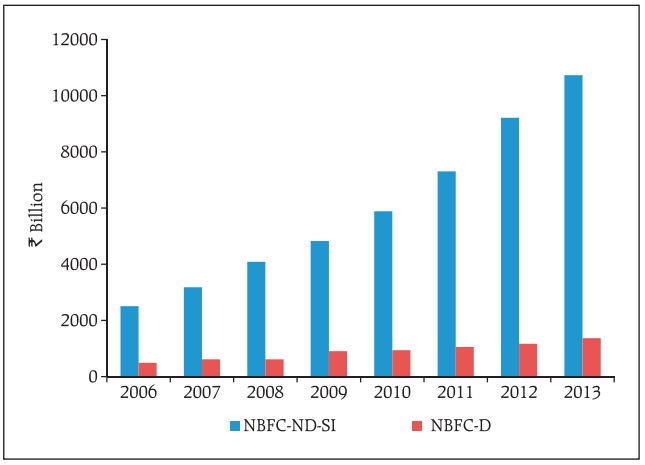
taking companies increased during this period. In view of these trends and the changing profile of the NBFC sector, the Reserve Bank has subsequently extended the regulatory requirements applicable to NBFC-D category (in respect of capital adequacy and credit concentration norms) to the non-deposit taking but systemically important NBFCs (NBFC-ND-SI) also. Charts 3.3 and 3.4 give the trends in number of companies and total assets of NBFCs in the categories of NBFC-D and NBFC-ND-SI.

Chart 3.3: Number of Companies- NBFC-D and NBFC-ND-SI



Source: RBI Supervisory Returns

Chart 3.4: Total Assets of NBFC-D and NBFC-ND-SI



Source: RBI Supervisory Returns

Proposed Regulatory Changes for NBFC Sector

3.38 The NBFC sector is presently in the process of a regulatory overhaul. The Working Group on NBFCs in its report submitted in August 2011 has made far reaching recommendations; both to ensure the resilience of the NBFC sector and to contain risks emanating from the sector in the context of overall financial stability. The draft guidelines based on recommendations of the Working Group have been placed in public domain for comments in December 2012 and the final guidelines are expected shortly. The major recommendations can broadly be divided into four categories, namely (i) Entry Point norms, Principal Business Criteria, Multiple and Captive NBFCs; (ii) Corporate Governance including Disclosures, (iii) Liquidity management and (iv) Prudential regulation including capital adequacy, asset provisioning, risk weights for certain sensitive exposures, and restrictions on deposit acceptance.

Money Market Mutual Funds

Low Retail Participation

3.39 In India, MMMFs and liquid fund schemes are regulated within the ambit of SEBI (Mutual Funds) Regulations 1996. The MMMFs are those mutual funds which are set up with the objective of investing exclusively in money market instruments. The Liquid mutual fund schemes can make investment in / purchase debt and money market securities with residual maturity of up to 91 days. Presently, the MMMFs and liquid funds are mainly used by the

institutional investors as an investment vehicle which is accessible, convenient and cost-effective with protection of the principal and liquidity. At the end of March, 2013, the net assets under management (AUM) of MMMFs/Liquid funds in India was around ₹934 billion, with 98 per cent of the contributions coming from non-retail investors. The MMMFs account for 19 per cent of the total AUM of the debt mutual funds which, in turn, form 71 per cent of the whole mutual fund sector.

Absence of Constant Net Asset Value Feature

3.40 As constant Net Asset Value (NAV) MMMFs do not exist in India, the risks observed in some advanced jurisdictions, especially the US, are not relevant. The valuation norms have been reviewed by SEBI and accordingly the overarching and overriding principles of fair valuation were outlined in a notification issued in February 2012. This included valuation of securities of all maturities reflective of the realisable value/ fair value. All debt and money market securities across maturities are to be valued at the weighted average price at which they are traded on the particular valuation day and in case such securities are not traded on a particular valuation day then the securities with residual maturity up to 60 days are to be valued on amortisation basis and securities with residual maturity over 60 days have to be valued at benchmark yield/ matrix of spread over risk free benchmark yield obtained from agencies entrusted for the said purpose, provided such valuation is be reflective of the realisable value/ fair value of the securities/assets.

Liquidity Risks of Short Term Debt Funds - Regulatory Measures

3.41 The liquid funds and other short term debt funds in India had faced severe liquidity strain from redemption pressures, as an impact of the global financial crisis during 2008-09. The Reserve Bank had facilitated a short term liquidity window to mutual funds to help ease liquidity pressures. Subsequently, a number of prudential measures were put in place to help the mutual funds withstand the impact of such events of liquidity stress in future.

3.42 These regulatory measures included the restriction on investments of Liquid funds to instruments of up to 91 day residual maturity (as against 182 days permitted earlier), with a view to addressing the asset liability mismatches in open ended schemes. The listing of close ended mutual fund schemes has been made mandatory to provide investors with an exit option. Also, the close ended schemes are allowed to invest in securities of residual maturities not exceeding the maturity of the scheme itself, for a better asset liability management. The provisions regarding uniform cut-off timings for applicability of NAV of mutual fund schemes/plans were modified. The application for investment has to be recognised only after the funds are available for utilisation before the cut-off time without availing any credit facility. Further, to address the credit and concentration risks, no mutual fund scheme is allowed to invest more than thirty percent of its net assets in money market instruments of an issuer, except for investments in Government securities, treasury bills and collateralised borrowing and lending obligation (CBLO).

Circular Flow of Funds between Banks and Liquid Mutual Funds

3.43 In recent years, banks' investments in liquid schemes of mutual funds have grown manifold[17]. The liquid schemes continue to rely heavily on institutional investors such as commercial banks whose redemption requirements are likely to be large and simultaneous. On the other hand, these mutual funds are large lenders in the over-night money market instruments such as CBLO and market repo, where banks are large borrowers. The various schemes of mutual funds also invest heavily in certificates of deposit (CDs) of banks.

[17] Section 2.12 of Chapter II of this Report may also be seen.

Such circular flow of funds between banks and mutual funds could lead to systemic risk in times of liquidity stress. With a view to address these risks, the Reserve Bank has stipulated that the total investment by banks in liquid/short term debt schemes of mutual funds with weighted average maturity of portfolio of not more than 1 year will be subject to a prudential cap of 10 per cent of their net worth as on March 31 of the previous year.

Regulatory Gaps in Collective Investment Schemes

3.44 Some instances have come to light of certain individuals / companies raising money from public by taking advantage of the lack of clarity about in the legal provisions and roles of different agencies like Ministry of Corporate Affairs (MCA), SEBI, RBI, State Governments, and Registrar of Co-operative Societies *etc.* This highlights the need for extending the regulatory perimeter and also plugging the regulatory gaps in the existing framework.

Role of State Governments and Law Enforcement Agencies

3.45 As an immediate interim measure to address the regulatory gap, there is greater focus on information sharing and increased co-ordination among the existing regulators, with an active role for the State Governments. There is also a need for a greater involvement of and coordination with the law enforcement agencies, through the platforms like State level Coordination Committees (SLCC). However, despite all efforts to fill regulatory gaps, the risk appetite and vulnerability of the individual investors to succumb to promises of high returns are difficult to curb. The regulators have taken measures, from time to time, to caution the public and investors to avoid getting lured by various schemes promising fast and high rates of return.

Market conduct and Consumer protection

3.46 Intense competition and perverse incentive structures have frequently led to widespread mis-selling of products and misdirection of clients to inappropriate and risky investments by financial service providers. The instances of mis-selling of products have been observed across customer groups, such as faulty derivatives to corporates (for hedging their exposures) or inappropriate insurance products to individuals. The reputation risk for individual institutions indulging in such activities for short term gains is high. Against this backdrop, regulation is increasingly tilting towards strengthening the aspects of consumer protection and market conduct in the financial sector.

Bancassurance

Mis-selling

3.47 Under, 'bancassurance' model, banks in India have been permitted to undertake insurance business as agents of insurance companies subject to certain conditions and without any risk participation since August 2000. As announced in the Union Budget 2013-14, it is proposed to permit banks to act as insurance brokers so that the entire network of bank branches will be utilised to increase the penetration of insurance services in the country. As insurance brokers the banks will be able to sell insurance products of any company, as against the restriction of only one company applicable under the agent-principal model.

Use of unfair and restrictive practices

3.48 While banks are well suited to distribute insurance products because of their wide network, several issues have arisen regarding their conduct in the process, generally pertaining to mis-selling and certain restrictive / unfair practices (such as linking provision of locker facilities to purchase of insurance products, selling of unsuitable and/or multiple policies *etc.*).

3.49 It was observed that in some cases, banks did not have clear segregation of duties of marketing personnel from other branch functions and bank employees were directly receiving incentives from

third parties such as insurance companies, mutual funds and other entities for selling their products. In some cases direct incentives to the bank staff have created distortions in the sales structure.

3.50 According to IRDA's Annual Report 2011-12 the maximum complaints in life insurance related to mis-selling. They also mainly pertained to the private sector, though LIC leads the business with over 70 per cent share. The type of complaints were mainly in the nature of unfair trade practices and mis-selling of products (*e.g.* malpractices, actual product sold being different from what was proposed, single premium policy being issued as annual premium policy, surrender value being different from projected, free look refund not paid, misappropriation of premiums *etc*). As a significant portion of private life insurance companies use banks as their corporate agents, there seems to be an urgent need to revisit the marketing and sales strategies used by the banks in pushing insurance products, especially since insurance is among the more complex of financial products for the common man to fully comprehend. Recently, banks in the UK have also been penalised for mis-selling of payment protection insurance to their lending/ credit card customers.

3.51 The limits on commission structure and the operating expenses of insurance companies are laid down in the Insurance Act, 1938 and the Rules framed there under. The compliance with these limits is being monitored by IRDA on an annual basis, and instances of breach are dealt with through penal action. In recent past, there have been instances of both insurance companies as also the corporate agents (banks) being penalised.

3.52 Banks have been advised to disclose to the customers, details of all the commissions / other fees (in any form) received, if any, from the various companies for marketing / referring their products, even in cases where the bank is marketing/ distributing/ referring products of only one company. As a further step in enhancing transparency, banks have also been advised to disclose details of fees / remuneration received in respect of the bancassurance business undertaken by them in the 'Notes to Accounts', from the year ending March 31, 2010. Similar disclosures and codes of conduct for insurance companies have been prescribed by IRDA also. The IRDA is working with the RBI to ensure that the disclosure made by the banks acting as corporate agents, in the Notes to Accounts are enhanced to bring about transparency in the nature of payments received by them.

Mis-selling in Wealth Management and Other Related Activities

3.53 Wealth Management Services (WMS) generally include referral services, Investment Advisory Services (IAS) and Portfolio Management Services (PMS). In India, banks are permitted to offer very limited services, mainly advisory and referral services.

3.54 Grievances relating to mis-selling, whereby products that are unsuitable for a particular customer, either for commission-linked reasons or lack of knowledge, clarity regarding accountability between the product issuer and the advisor/portfolio manager, need to be addressed by improving consumer protection measures. The issues have been widely debated in the inter-regulatory technical group of the FSDC Sub Committee and a review of the extant guidelines on wealth management services offered by banks is being carried out. The aspects on marketing and distribution of third party financial products by banks also need to be factored in while issuing comprehensive guidelines on Wealth Management Services by banks.

3.55 The recently notified SEBI (Investment Advisers) Regulations, 2013, contain detailed norms for risk profiling and suitability, creation of a Separately Identifiable Department or Division (SIDD) for IAS, detailed disclosure to the clients including any conflicts of interest, redressal of investor grievances, *etc.* Such norms are expected to address mis-selling risks to a certain extent.

Need for Stronger Operational Procedures

3.56 All financial sector entities need to comply with the extant KYC, which are meant for safeguarding the financial system against the possibility of its use for money laundering. There is a move for simplifying the KYC guidelines and also towards achieving a uniform basic KYC structure for various segments of the financial system.

3.57 In the wake of recent episodes reported in the media, the Reserve Bank undertook investigations to examine the practices at certain banks involving structuring of transactions to aid tax evasion and fraudulent transfer of funds. Some of these practices related to sale of third party products such as insurance and wealth management services which have been discussed in previous sections. The main findings point towards laxity in adherence to the Know Your Customer / Anti Money Laundering (KYC/AML) guidelines by banks.

3.58 The areas where banks are required to adopt more focussed strategies to ensure adherence to KYC/AML measures include, among other things, monitoring large value transactions in newly opened accounts, operational control over multiple customer identities for the same customer, enhanced skill sets in dealing with money laundering alerts, quicker follow-up and escalation of suspicious transactions. Such measures also relate to accelerated review of risk categorisation at prescribed intervals, need for review of alert thresholds in AML monitoring systems in tune with changing dimensions of transactions in various accounts. Further, the banks need to address the concerns on tackling technological issues involved in updating changes in customers' details over phone lines or through internet banking leading to frauds, diligent adoption of single and enhanced due diligence (SDD/EDD) measures for ascertaining and updating KYC details of customers, dealing with issues relating to splitting of transactions with a view to avoid anti-money laundering checks *etc.*

3.59 The supervisory efforts of the Reserve Bank have been combined with 'guidance' in the form of specific circulars and the broad regulatory guidelines issued to the banks on the subject. Such guidance has covered aspects relating to (i) IT initiatives to be taken by banks for enabling appropriate risk based transaction monitoring mechanism, (ii) dedicated KYC Audits, (ii) recommending operational aspects relating to risk profiling, (iv) fictitious offers of funds/fake lottery rackets/phishing *etc.*

Technology Risks[18] in the Changing Business Environment

3.60 Alongside the rapidly increasing use of technology in banking and finance in recent years, the risks emanating from abuse and failure of technology have also risen. The recent cases of cyber frauds at some banks have highlighted the increasing complexity, sophistication and diversity in the risks to the security and integrity of technology based banking and finance. Globally, the use of online and mobile technologies is driving the proliferation of virtual banks, virtual currencies (Box 3.4) and provision of banking and payment services by un-licensed entities. While leveraging on technology has resulted in many benefits, especially, in extending the reach of the financial services, these developments pose challenges in the form of regulatory, legal and operational risks.

3.61 One of the main risks related to the information technology (IT) systems in banks relates to the obsolescence of the technology and processes built according to the needs of the then prevailing regulatory-cum-business environment. Therefore, a

[18] Technology risks relate to any adverse outcome, damage, loss, disruption, violation, irregularity or failure arising from the use of or reliance on computer hardware, software, electronic devices, online networks and telecommunications systems. These risks can also be associated with systems failures, processing errors, software defects, operating mistakes, hardware breakdowns, capacity deficiencies, network vulnerabilities, control weaknesses, security shortcomings, internal sabotage, espionage, malicious attacks, hacking incidents, fraudulent conduct and defective recovery capabilities.

Box 3.4: Virtual Currency Schemes

A virtual currency can be defined as a type of unregulated, digital money, which is issued and usually controlled by its developers, and used and accepted among the members of a specific virtual community[19]. The virtual currency schemes provide a financial incentive for virtual community users to continue to participate and are able to generate 'float' revenue for their owners. They also provide a high level of flexibility regarding the business model and business strategy for the virtual community.

There are different kinds of virtual currency schemes in vogue at present. While for some kinds of virtual currencies there is no interaction or exchangeability with the 'real' currency, for others the relationship with the real money, goods and services is more active and direct. The 'closed' virtual currency schemes, which are mostly used in online games, have no connection with the real money. Some virtual currency schemes offer the facility of a (mostly unidirectional) conversion rate for purchasing the virtual currency, which can subsequently be used to buy virtual goods and services. Under another category of virtual currency schemes which provide for bidirectional flows, the virtual currency acts like any other convertible currency, with two exchange rates (buy and sell). In such schemes, the virtual currency can be used to buy not only the virtual goods and services, but also to purchase real goods and services. Virtual currency schemes are different from electronic money schemes as the virtual currency being used as the unit of account has no physical counterpart with legal tender status.

A virtual currency scheme may also be designed to compete with traditional currencies used for international trade. The absence of a distinct legal framework implies that the traditional rules under financial sector regulation and supervision, including the institution of central banks, are not involved in the case of virtual currency. Also, the unregulated link between virtual currency (if permitted), and traditional currency with a legal tender status poses challenges as the complete control over the differently denominated virtual currency is given to its issuer, who governs the scheme and manages the supply of money at will.

The regulators are studying the impact of online payment options and virtual currencies to determine potential risks associated with them.

review of suitability of the existing IT infrastructure is required to be carried out to assess the capability of the IT systems to handle the changing demands of business and compliance functions in the evolving environment.

Need for Review of IT Risk Management Framework

3.62 Globally, the management of IT systems is being increasingly outsourced. There is a wide spread trend of further sub-contracting of some of the sub-processes by the primary outsourcer to third parties, which exposes the clients to transfer risks. The legal issues, pricing and service level agreement (SLA) terms with the outsourced vendor play an important role in case of a dispute with the outsourced vendor who has the responsibility of completing the assigned responsibility. With this, risks relating to security and reputation come to the fore, which need to be dealt with carefully.

3.63 In view of the risks arising out increased use of technology, there is a need for banks to implement systems and processes to establish a robust technology risk management framework. There is a need for these institutions to put in place adequate risk mitigation techniques and security controls to ensure business continuity. Further, banks and regulators have to play a proactive role in increasing the financial awareness of their customers, especially under the IT environment. The regulators have taken various measures to address the emerging technology risks in their respective areas, *e.g.* the Reserve Bank has issued additional guidelines[20] to the banks on securing card transactions and electronic payment transactions.

[19] ECB (2010), "Virtual Currency Schemes", *Report by the European Central Bank*, October

[20] http://rbi.org.in/scripts/NotificationUser.aspx?Id=7874&Mode=0

Financial Market Infrastructure

Compliance with International Standards in Financial Market Infrastructure

3.64 India is committed to the adoption and implementation of the international standards and best practices in payment systems including, the new Committee on Payment and Settlement Systems (CPSS)-IOSCO standards Principles of Financial Market Infrastructures (PFMIs). The oversight framework for CCIL is proposed to be drawn up based the PFMIs and CCIL was assessed using the assessment methodology of the PFMIs. As found from this exercise, CCIL has implemented several measures to strengthen its risk management framework which include complete revamp of the margining system in Securities Segment, implementation of changes to forex forwards regulations pertaining to exit option for members, limited liability for members and computation of default fund *etc.*

3.65 The Securities and Exchange Board of India (SEBI) has also examined the policies related to technology risk management being followed by the Financial Market Infrastructures (FMIs) under its regulatory jurisdiction, *viz.* exchanges, clearing corporations and depositories. It has been found that while there were no major technology risks to the functioning of FMIs at present, the technology infrastructure needed to be geared to meet the newer challenges.

Payment and Settlement Systems

3.66 The payment and settlement systems (PSS) forming the major part of the FMI play a vital role in ensuring financial stability. The PSS infrastructure in India continued to perform without any major disruptions. The broad policy direction of the Reserve Bank, which has the legislative authority to regulate and supervise PSS in the country, is inclined to migrating an increasing proportion of all payment transactions, especially the large value / wholesale transactions, to the electronic payment products.

Risks from High Frequency Trading

3.67 The previous FSRs had covered the potential risks from high-frequency trading (HFT) in equity markets. Even as the risks from HFT specific to the segments of the market are being addressed, the nature of the HFT and the associated risks are undergoing a transformation due to innovations like 'big data[21]'. The 'new HFT'[22] using analytics and algorithms based on 'big data' attempt to develop trading strategies by extracting information on market sentiments from the enormous amount of information available on internet including the social media. As the use of big data is transforming the financial markets, the regulations also need to keep pace.

Regulation of Algorithmic Trading in Indian Equity Markets

3.68 At present, Algorithmic trading (Algo) and HFT account for only about 14 per cent of the cash market turnover in the Indian exchanges as against 80 per cent in developed markets like US and Europe. A proper regulatory structure and continuous monitoring of regulatory systems would avert, *inter alia*, operational risks and other risks posed by Algo and HFT. As algorithmic trading is an evolving field, SEBI and stock exchanges are continuously studying the practice and taking steps as deemed necessary to minimise the associated risks and to better regulate the same.

3.69 India is one of the few securities markets in the world to implement a framework regulating the practice of algorithmic trading. SEBI has issued instructions in March 2012 which *inter alia* included a list of minimum order-level checks to be performed

[21] The term 'big data' refers to large or /and complex data sets which cannot be efficiently managed with the standard software tools.

[22] Shah S, A. Horne and J. Copella (2012), ''Good Data Won't Guarantee Good Decisions'', *Harvard Business Review*, April

on algorithmic orders, framework for penalising cases of high order-to-trade ratios and framework of conformance testing of new algorithms. Other risk management measures that have also been mandated include increase in the Base Minimum Capital (BMC) of the trading members that undertake algorithmic trading and changes to the practice of enablement of the trading terminals of the trading members that were disabled upon exhaustion of the collateral. In continuum to the earlier instructions, SEBI has laid down further guidelines by specifying that the stock brokers / trading members that provide the facility of algorithmic trading shall subject their algorithmic trading system to a system audit every six months in order to ensure that the requirements prescribed by SEBI / stock exchanges with regard to algorithmic trading are effectively implemented.

Need for ensuring fairness in order management under co-location facility

3.70 SEBI is presently examining various issues, as part of proposed measures to better regulate the facility of co-location. SEBI's proposals seek to provide greater equality and fairness in order handling to the participants that do not use co-location services *vis-à-vis* participants that place orders using automated trading system and are co-located at the stock exchange.

Erroneous Trades on the Stock Exchanges – Measures Taken

3.71 "Error Trades" are transactions that result from system or human error in entering the order parameters such as name of the security, volume to be traded, price for trade, *etc.* Such unintended trades usually have an adverse effect on the price formation and impact orderly trading. While incidents of erroneous orders are few as compared to the total number of orders handled by the exchanges in a year, measures implemented by the stock exchanges such as 'upfront real-time risk management system', 'scrip-level price bands' and 'market-wide index circuit breakers', are expected to limit the damage that may result from erroneous orders. SEBI has also taken measures to strengthen the pre-trade risk management framework by introducing Value per order Limit, Cumulative limit on value of unexecuted orders of a stock broker, Dummy price bands and Risk Reduction Mode *etc.*

Exposure of Settlement Guarantee Funds of Clearing Houses to banks

3.72 In the screen-based trading environment where counterparties to trade are anonymous, Clearing Corporation/ Clearing House of a Stock Exchange acts as a CCP and guarantees settlement of net obligations arising out of trades executed on the stock exchange. Under this arrangement, the CCP assumes the risks of unsettled transactions on behalf of the brokers and their ultimate clients. In order to mitigate these risks, the CCP maintains a Settlement Guarantee Fund (SGF) and collects margins which comprise of contributions from brokers/clients in the form of Bank Guarantees and securities (which may in turn be issued by banks) amongst others. The CCP is thus exposed to the banks both directly and indirectly and therefore CCPs are interconnected to Banks they are exposed to. This interconnectedness of CCPs to banks can be a potential source of systemic contagion, in case of failure of a bank.

Concentration of Exposure of CCPs to Banks

3.73 SEBI, in its guidelines issued in February 2005, had specified that the stock exchanges shall lay down exposure limits either in absolute terms or as percentage of the Trade Guarantee Fund (TGF) / SGF that can be exposed to a single bank directly or indirectly. The total exposure includes guarantees provided by the bank for itself or for others, as well as debt or equity securities of the bank which have been deposited by members towards total liquid assets.

3.74 Accordingly, National Securities Clearing Corporation Limited (NSCCL), the clearing house of the National Stock Exchange (NSE) has specified a maximum exposure limit of 15 per cent of SGF for a single bank in respect of bank guarantee and bank securities that can be accepted as collaterals. These norms are periodically monitored for adherence to specified limits. NSCCL accepts collaterals issued by empanelled banks in the specified forms namely bank guarantees and fixed deposit receipts. Currently there are 58 empanelled banks with NSCCL for the purpose, while Indian Clearing Corporation Limited (ICCL) of the Bombay Stock Exchange (BSE) accepts Bank Guarantees issued by Schedule Commercial Banks only. SEBI also has specified that not more than 5 per cent of the TGF/SGF or 1 per cent of the total liquid assets (TLA) deposited with the exchange, whichever is lower, shall be exposed to any single bank which has a net worth of less than ₹5 Biliion and is not rated P1 (or P1+) or equivalent, by a RBI recognised credit rating agency or by a reputed foreign credit rating agency, and not more than 50 per cent of the TGF/SGF or 10 per cent of the total liquid assets deposited with the exchanges, whichever is lower, shall be exposed to all such banks put together.

Possible Concentration Risks Due to Common Set of Banks

3.75 The exposures of SGFs of NSCCL and ICCL, to the top five banks (Table 3.2) are adequately diversified. As per the exposure limits specified by NSCCL, SGF can have the highest exposure of 75 per cent to top five banks put together. While the exposure of the SGF of NSCCL and the exposure of the SGF of ICCL are individually less than the upper limit, the fact that four banks are common in the list of top five banks, makes it even more important that the exposures limits are monitored on an ongoing basis.

Table 3.2: Exposure of NSCCL and ICCL to top five banks (as on March 31, 2013)

NSCCL			ICCL		
Sl. No.	**Bank Name**	**Exposure as a % of SGF**	**Sl. No.**	**Bank Name**	**Exposure as a % of SGF**
1.	Bank 1	8.09	1.	Bank 1	7.63
2.	Bank 2	4.85	2.	Bank 2	6.13
3.	Bank 3	4.65	3.	Bank 3	3.38
4.	Bank 4	2.92	4.	Bank 4	1.78
5.	Bank 5	1.85	5.	Bank 5	1.42
Total Exposure to Top 5 Banks		**22.76**	Total Exposure to Top 5 Banks		**20.34**

Note: In case of BSE exposure is a % of SGF+Total Liquid Assets
Source: NSE & BSE

Annex-1

Systemic Risk Survey

The Systemic Risk Survey (SRS) was initiated by the Reserve Bank in October 2011 to capture the views of market participants and other stakeholders on the aggregate risks facing the financial system. The present Survey was conducted in April 2013.

As the factors driving the on-going turmoil in global financial markets have been changing, the perception of market participants has also changed from the first round of SRS conducted in October 2011 to the latest round conducted in April 2013. Deterioration in asset quality and market volatility were perceived to be important factors affecting the financial system during the first SRS. As per the latest survey, market participants perceive global and macro-economic risks to be the most important factors affecting the financial system. Majority of respondents feel that there is medium chance of a high impact event occurring in the global financial system, whereas, in the first SRS, the chance of occurrence of high impact event in the global financial system was high. The participants, however, continued to have fair confidence in the stability of the Indian financial system (Table 1).

Among the global risks, declining global growth, sovereign risk/contagion and global inflation are polled as prominent factors. Deterioration of the domestic outlook, domestic inflation, elevated current account deficit, high fiscal deficit and lack / slow pace of infrastructure development are major macroeconomic risks identified by participants. The foreign exchange risk, funding risk, asset quality deterioration and low credit off-take have also been mentioned as risks facing the Indian financial system (Table 2).

Survey respondents felt that there was a medium chance of a high impact event occurring in the Indian financial system in the next half-year period. The stakeholders had medium level of confidence in the stability of the global financial system as a whole. There is a perception that if instability in the global financial system escalates in the next six months, the stability of the Indian economy would be impacted strongly. However, the survey also indicates that the participants are fairly confident of the stability of the Indian financial system (Table 3). Further, the perception has remained mostly unchanged during the past half-year (Chart 1).

Table 1: Major Risk Groups identified in Systemic Risk Survey – April 2013

Major Risk Groups	Apr-13	Shift	Oct-12	Shift	Apr-12	Shift	Oct-11
A. Global Risks		⇔		⇑		⇔	
B. Macro-economic Risks		⇑		⇓		⇓	
C. Market Risks		⇓		⇓		⇔	
D. Institutional Risks		⇑		⇔		⇓	
E. General Risks		⇔		⇔		⇔	

Note:

Risk Category

Very high	High	Medium	Low	Very low

Change in risk since last survey		
⇑	⇔	⇓
Increased	Same	Decreased

The risk perception as emanating from the systemic risk survey conducted at different time points (on half yearly basis in April and October), may shift (increase/ decrease) from one category to the other, which is reflected by change in colour. However, within the same risk category (i.e. the boxes with same colour), the risk perception may also increase/ decrease or remain the same, which have been shown by the arrows. The shift in risk perception is between two consecutive surveys.

Source: RBI, Systemic Risk Surveys – October 2011 to April 2013

Table 2: Various Risks identified in Systemic Risk Survey – April 2013

Risk Item		Apr-13	Changes	Oct-12
A. Global Risks	Global slow down		⇩	
	Sovereign Risk / Contagion		⇩	
	Funding Risk (External Borrowings)		⇧	
	Global Inflation / Commodity Price Risk (including crude oil prices)		⇧	
	Other Global Risks		⇩	
B. Macro-economic Risks	Deterioration in domestic economic outlook		⇩	
	Domestic Inflation		⇧	
	Current Account Deficit		⇧	
	Capital inflows/ outflows (Reversal of FIIs, Slow down in FDI)		⇔	
	Sovereign rating downgrade		⇧	
	Fiscal Risk (High Fiscal deficit)		⇔	
	Corporate Sector Risk (High Leverage/ Low Profitability)		⇩	
	Lack / Slow pace of Infrastructure development		⇩	
	Real Estate Prices		⇩	
	Household savings		⇧	
	Political Risk		⇩	
	Other Macroeconomic Risks		⇧	
C. Market Risks	Foreign Exchange Rate Risk		⇩	
	Equity Price Volatility		⇩	
	Funding Risk / Liquidity Risk/ Interest Rate Risk		⇧	
	Other Market Risks		⇔	
D. Institutional Risks	Regulatory Risk		⇔	
	Asset quality deterioration		⇧	
	Additional capital requirements of banks		⇩	
	Funding difficulties of banks		⇧	
	Low credit off-take		⇧	
	Excessive credit growth		⇔	
	Operational Risk		⇧	
	Other Institutional Risks		⇔	
E. General Risks	Terrorism		⇔	
	Natural disaster		⇩	
	Social unrest (Increasing inequality)		⇔	
	Other General Risks		⇔	

Note:

Risk Category

Very high	High	Medium	Low	Very low

Change in risk since last survey		
⇧	⇔	⇩
Increased	Same	Decreased

The risk perception as emanating from the systemic risk survey conducted at different time points (on half yearly basis in April and October), may shift (increase/ decrease) from one category to the other, which is reflected by change in colour. However, within the same risk category (i.e. the boxes with same colour), the risk perception may also increase/ decrease or remain the same, which have been shown by the arrows. The shift in risk perception is between two consecutive surveys

Source: RBI, Systemic Risk Surveys – October 2012 and April 2013

Table 3: Perception on occurrence of high impact events and their impact on Indian financial system

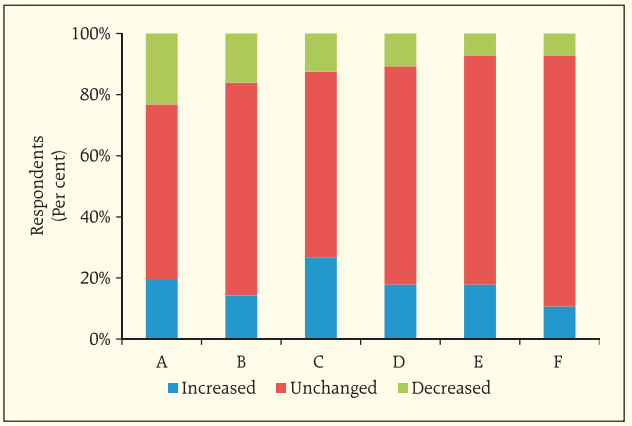
A : High impact event occurring in the global financial system in the period ahead (In Short Term : upto 1 year)	
B : High impact event occurring in the global financial system in the period ahead (In Medium Term : 1 to 3 years)	
C : High impact event occurring in the Indian financial system in the period ahead (In Short Term : upto 1 year)	
D : High impact event occurring in the Indian financial system in the period ahead (In Medium Term : 1 to 3 years)	
E : Confidence in the stability of the global financial system as a whole	
F : Expectation that instability in the global financial system, if it escalates in the next six months, would affect the stability of the Indian economy	
G : Confidence in the stability of the Indian financial system	

Note:

Risks					
A - D	Very high	High	Medium	Low	Very low
E &G	No confidence	Not very confident	Fairly confident	Very confident	Complete confidence
F	Affect significantly	Affect to a large extent	Affect somewhat	Affect to a limited extent	No impact

Source: RBI, Systemic Risk Survey – April 2013

Chart 1: Change in Perception over the past six months



A : High impact event occurring in the global financial system in the period ahead (In Short Term: upto 1 year)

B : High impact event occurring in the global financial system in the period ahead (In Medium Term: 1 to 3 years)

C : High impact event occurring in the Indian financial system in the period ahead (In Short Term: upto 1 year)

D : High impact event occurring in the Indian financial system in the period ahead (In Medium Term: 1 to 3 years)

E : Confidence in the stability of the global financial system as a whole

F : Confidence in the stability of the Indian financial system

Source: RBI, Systemic Risk Survey – April 2013

Annex-2

Methodologies

Macroeconomic Stability Map

The Macroeconomic Stability Map is based on seven sub-indices, each pertaining to a specific area of macroeconomic risk. Each sub-index on macroeconomic risk includes select parameters representing risks in that particular field. These sub-indices have been selected based on their impact on macroeconomic or financial variable such as GDP, inflation, interest rates or assets quality of banks. The seven sub-indices of the overall macroeconomic stability index and their components are briefly described below:

Global Index: The global index is based on output growth of the world economy. A fall in output growth affects overall sentiments for the domestic economy in general and has implications for demand for domestic exports, in particular. Capital flows to the domestic economy are also affected by growth at the global level. Therefore, a fall in output growth is associated with increased risks.

Domestic Growth: The domestic growth index is based on growth of gross domestic product. A fall in growth, usually, creates headwinds for bank asset quality, capital flows and over-all macroeconomic stability. Hence, a fall in growth is associated with increased risks.

Inflation: Wholesale Price Index Inflation is used to arrive at the Inflation Index. Increase in inflation reduces purchasing power of individuals and complicates investment decision of corporate. Therefore, an increase in inflation is associated with higher risks.

External Vulnerability Index: The Current Account Deficit to GDP Ratio, Reserves Cover of Imports and ratio of Short Term Debt to Total Debt are included in the external vulnerability Index. Rising CAD and ratio of short term debt to total debt and falling Reserves Cover of Imports depict rising vulnerability.

Fiscal Index: The fiscal index is based on fiscal deficit and primary deficit. Higher deficits are associated with higher risk. High government deficit, in general, reduces the resources available to the private sector for investment and also has implications for inflation.

Corporate Index: The health of the corporate sector is captured through profit margin[EBITDA (Earnings before Interest, Tax, Depreciation and Amortisation) to Sales], the interest coverage ratio [EBIT (Earnings before Interest, Tax) to Interest Payments]. A lower profit margin and lower interest coverage ratio are associated with higher risks.

Household Index: This Index is based on retail non performing assets. Increase in retail NPAs is associated with higher risk.

Financial Markets Stability Map

With the objective to measure stability of the financial market, Financial Market Stability Map has been prepared based on the indicators of four sectors/markets namely banking sector, foreign exchange market, equity market and debt market. The indicators selected from various sectors/markets are following; i) Banking Sector: Beta of CNXBANK Index and NIFTY Index, CD Rate and CD rate minus Implied Forward rate, ii) Foreign Exchange Market: CMAX of daily INR-US Dollar exchange rate, which is defined as $X_t/Max(X_i, i=1,2,..upto\ one\ year)$. Where, Xt is the INR-US Dollar exchange rate at time t, and 25 Delta Risk Reversals of foreign exchange rate, iii) Equity Market: Inverse of NIFTY CMAX and India VIX, and iv) Debt Market: Corporate bond which is average return of corporate bonds rated A, AA, and AAA, 10-years Government bond yield and CP Rate.

Variance-equal transformation has been used to convert the indicators at same level before construction of the Map. Four indicators for the four selected sectors/market were prepared based on simple average of elementary indicators which are presented as a cobweb map.

Systemic Liquidity Index

Systemic liquidity in the financial system refers to the liquidity scenario in the banking sector, non-banking financial sector, the corporate sector and prevailing foreign currency liquidity. Current needs for liquidity are also influenced by expectations about availability of funds and their rates in future. The Systemic Liquidity Index(SLI) was constructed using the following four indicators representing various segments of the market:

- Weighted Average Call Rate minus RBI Repo Rate
- 3 month Commercial Paper (CP) Rate minus 3 month Certificate of Deposits (CD) Rate
- 3 month CD Rate minus 3 month Forward Implied Deposit Rate
- Weighted Average Call Rate minus 3 Month Overnight Index Swap (OIS) Rate

The SLI was derived as a simple average of the Standard normal or Variance-equal transformed values of the above mentioned indicators.

Banking Stability Map and Indicator

The Banking Stability Map and Indicator (BSI) present an overall assessment of changes in underlying conditions and risk factors that have a bearing on stability of the banking sector during a period. Following ratios are used for construction of each composite index:

Table : Indicators used for construction of Banking Stability Map and Banking Stability Indicator

Dimension	**Ratios**			
Soundness	CRAR	Tier-I Capital to Tier-II Capital	Leverage ratio as Total-Assets to Capital and Reserves	
Asset-Quality	Net NPAs to Total-Advances	Gross NPAs to Total-Advances	Sub-Standard-advances to gross NPAs	Restructured-Standard-Advances to Standard-Advances
Profitability	Return on Assets	Net Interest Margin	Growth in Profit	
Liquidity	Liquid-Assets to Total-Assets	Customer-Deposits to Total-Assets	Non-Bank-Advances to Customer-Deposits	Deposits maturing within-1-year to Total Deposits
Efficiency	Cost to Income	Business (Credit + Deposits) to staff expenses		Staff Expenses to Total Expenses

The five composite indices represent the five dimensions of Soundness, Asset-quality, Profitability, Liquidity and Efficiency. Each index, representing a dimension of bank functioning, takes values between zero (minimum) and 1 (maximum). Each index is a relative measure during the sample period used for its construction, where a high value means the risk in that dimension is high. Therefore, an increase in the value of the index in any particular dimension indicates an increase in risk in that dimension for that period as compared to other periods. For each ratio used for a dimension, a weighted average for the banking sectors is derived, where the weights are the ratio of individual bank asset to total banking system assets. Each index is normalised for the sample period as 'Ratio-on-a-given-date minus Minimum-value-in-sample-period divided by maximum-value-in-sample-period minus Minimum-value-in-sample-period'. A composite measure of each dimension is calculated as a weighted average of normalised ratios used for that dimension, where the weights are based on the marks assigned for assessment for CAMELS rating. Based on the individual composite indices for each dimension, the Banking Stability Indicator is constructed as a simple average of these five composite sub-indices.

Banking Stability Measures (BSMs) – Distress Dependency Analysis

In order to model distress dependency, methodology described by Goodhart and Segoviano (2009) has been followed. First, the banking system has been conceptualised as a portfolio of banks(BIs). Then, the PoD of the individual banks, comprising the portfolio, has been inferred from equity prices. Subsequently, using such PoDs as inputs (exogenous variables) and employing the Consistent Information Multivariate Density Optimizing (CIMDO) methodology (Segoviano, 2006), which is a non-parametric approach based on cross-entropy, the banking system's portfolio multivariate density (BSMD) have been derived. Lastly, from the BSMD a set of conditional PoDs of specific pairs of BIs, and the banking system's joint PoD(JPoD) are estimated.

The BSMD and thus, the estimated conditional probabilities and the JPoD, embed the banks' distress dependency. This captures the linear (correlation) and non-linear dependencies among the BIs in the portfolio, and allows for these to change throughout the economic cycle. These are key advantages over traditional risk models that most of the time incorporate only correlations, and assume that they are constant throughout the economic cycle.

Network Analysis

Matrix algebra is at the core of network analysis, which is essentially an analysis of bilateral exposures between entities in the financial sector. Each institution's lending and borrowings with all others in the system are plotted in a square matrix and are then mapped in a network graph. The network model uses various statistical measures to gauge the level of interconnectedness in the system. Some of the most important are as follows:

Connectivity: This is a statistic that measures the extent of links between the nodes relative to all possible links in a complete graph.

Cluster Coefficient: Clustering in networks measures how interconnected each node is. Specifically, there should be an increased probability that two of a node's neighbours (banks' counterparties in case of the financial network) are also neighbours themselves. A high clustering coefficient for the network corresponds with high local interconnectedness prevailing in the system.

Shortest Path Length: This gives the average number of directed links between a node and each of the other nodes in the network. Those nodes with the shortest path can be identified as hubs in the system.

In-betweeness centrality: This statistic reports how the shortest path lengths pass through a particular node.

Eigen vector measure of centrality: Eigenvector centrality is a measure of the importance of a node (bank) in a network. It describes how connected a node's neighbours are and attempts to capture more than just the number of out degrees or direct 'neighbours' a node has. The algorithm assigns relative centrality scores to all nodes in the network and a bank's centrality score is proportional to the sum of the centrality scores of all nodes to which it is connected. In general, for an NxN matrix there will be N different eigen values, for which an eigen vector solution exists. Each bank has a unique eigen value, which indicates its importance in the system. This measure is used in the network analysis to establish the systemic importance of a bank and by far it is the most crucial indicator.

Tiered Network Structures: Typically, financial networks tend to exhibit a tiered structure. A tiered structure is one where different institutions have different degrees or levels of connectivity with others in the network. In the present analysis, the most connected banks (based on their eigen vector measure of centrality) are in the inner most core. Banks are then placed in the mid core, outer core and the periphery (the respective concentric circles around the centre in the diagrams), based on their level of relative connectivity. The range of connectivity of the banks is defined as a ratio of each bank's in degree and out degree divided by that of the most connected

bank. Banks that are ranked in the top 10 percentile of this ratio constitute the inner core. This is followed by a mid core of banks ranked between 90 and 70 percentile and a 3rd tier of banks ranked between 40 and 70 percentile. Banks with connectivity ratio of less than 40 per cent are categorised as the periphery.

Solvency Contagion analysis

The contagion analysis is basically a stress test where the gross loss to the banking system owing to a domino effect of one or more bank failing is ascertained. We follow the round by round or sequential algorithm for simulating contagion that is now well known from Furfine (2003). Starting with a trigger bank i that fails at time 0, we denote the set of banks that go into distress at each round or iteration by Dq, q= 1,2, …For this analysis, a bank is considered to be in distress when its core CRAR goes below 6 per cent.

Liquidity Contagion analysis

While the solvency contagion analysis assesses potential loss to the system owing to failure of a net borrower, liquidity contagion estimates potential loss to the system due to the failure of a net lender. The analysis is conducted on gross exposures between banks. The exposures include fund based and derivatives. The basic assumption for the analysis is that a bank will initially dip into its liquidity reserves or buffers to tide over a liquidity stress caused by the failure of a large net lender. The items considered under liquidity reserves are (a) excess CRR balance; (b) excess SLR balance; (c) available marginal standing facility and (d) available export credit refinance. If a bank is able to meet the stress with the liquidity buffers alone, then there is no further contagion.

However, if the liquidity buffers alone are not sufficient, then a bank will call in all loans that are 'callable', resulting in a contagion. For the analysis only short term assets like money lent in the call market and other very short term loans are taken as callable. Following this, a bank may survive or may be liquidated. In this case there might be instances where a bank may survive by calling in loans, but in turn might propagate a further contagion causing other banks to come under duress. The second assumption used is that when a bank is liquidated, the funds lent by the bank are called in on a gross basis, whereas when a bank calls in a short term loan without being liquidated, the loan is called in on a net basis (on the assumption that the counterparty is likely to first reduce its short term lending against the same counterparty).

Macro Stress Testing

To ascertain the resilience of banks against macroeconomic shocks, macro stress test for credit risk was conducted. Here, the credit risk indicator was modeled as function of macroeconomic variables, using various econometric models that relate banking system aggregate to the macroeconomic variables. The time series econometric models being used are; (i) multivariate regression in terms of the slippage ratio; (ii) aggregate VAR using slippage ratio; (iv) quantile regression of slippage ratio, (v) multivariate panel regression on bank-group wise slippage ratio data; and (vi) multivariate regressions for sectoral NPAs. The banking system aggregates includes current and lagged values of slippage ratio, while macroeconomic variables include GDP growth, short term interest rate (call rate), WPI inflation, exports-to-GDP ratio $\left(\frac{Ex}{GDP}\right)$, gross fiscal deficit-to-GDP ratio $\left(\frac{GFD}{GDP}\right)$ and REER.

While the multivariate regression allows evaluating the impact of selected macroeconomic variables on the banking system's NPA and capital, the VAR model reflects the impact of the overall economic stress situation on the banks' capital and NPA ratio, which also take into account feed-back effect. In these methods, conditional mean of slippage ratio is estimated and assumed that the impact of macro variables on credit quality will remain same irrespective of the level of the credit quality, which may not always be true. In order to relax this assumption, quantile regression has been adapted to project credit quality, in which, in place of conditional mean the conditional quantile has been estimated.

The Modelling Framework

The following multivariate models were run to estimate the impact of macroeconomic shocks on the GNPA ratio/ slippage ratio (SR)[1]:

- *Aggregate banking system multivariate regression*

  The analysis was carried out on slippage ratio at the aggregate level for the commercial banking system as a whole.

$$SR_t = \alpha_1 + \beta_1 SR_{t-1} - \beta_2 \Delta GDP_{t-2} + \beta_3 Call_{t-1} - \beta_4 \left(\frac{Ex}{GDP}\right)_{t-2} + \beta_5 \Delta WPI_t + \beta_6 \left(\frac{GFD}{GDP}\right)_{t-1}$$

  Where, $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6 > 0$.

- *Vector AutoRegression (VAR)*

  In notational form, mean-adjusted VAR of order p (VAR(p)) can be written as

$$y_t = A_1 y_{t-1} + \ldots\ldots + A_p y_{t-p} + u_t \quad ; \text{t=0,1,2,3,....}$$

  Where, $y_t = (y_{1t}, \ldots\ldots, y_{Kt})'$ is a (K×1) vector of variables at time t, the A_1 (i=1,2,...p) are fixed (K×K) coefficient matrices and $u_t = (u_{1t}, \ldots\ldots, u_{Kt})'$ is a K-dimensional white noise or innovation process.

  In order to estimate, VAR system, slippage ratio, call rate, inflation, growth and REER were selected. The appropriate order of VAR has been selected based on minimum information criteria as well as other diagnostics and suitable order was found to be two. Accordingly, VAR of order 2 (VAR(2)) was estimated and stability of the model was checked based on roots of AR characteristic polynomial. Since, all roots are found to be inside the unit circle, this selected model was found to be fulfilling the stability condition. The impact of various macroeconomic shocks was determined using impulse response function of the selected VAR.

- *Quantile Regression*

  In order to estimate slippage ratio at desired level of conditional quantile, following quantile regression at median (which is the present quantile of slippage ratio) was used:

$$SR_t = \alpha_1 - \beta_1 SR_{t-1} - \beta_2 \Delta GDP_{t-1} + \beta_3 Call_{t-4} - \beta_4 \left(\frac{Ex}{GDP}\right)_{t-1} + \beta_5 \Delta WPI_t + \beta_6 \left(\frac{GFD}{GDP}\right)_{t-1}$$

  Where, $\alpha_1, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6 > 0$.

- *Bank-group wise panel fixed-effect regression*

  Bank-group wise slippage ratios were estimated using the following fix effect panel regression.

$$SR_{it} = \alpha_i + \beta_1 SR_{i(t-1)} - \beta_2 \Delta GDP_{t-1} + \beta_3 Call_{t-2} - \beta_4 \left(\frac{Ex}{GDP}\right)_{t-1}$$

  where, α_i is the bank-group specific parameter and $\alpha_i, \beta_1, \beta_2, \beta_3$, and $\beta_4 > 0$.

[1] Slippage ratio, exports/GDP, and the call rate are seasonally adjusted.

- *Sectoral multivariate regression*

  The impact of macroeconomic shocks on various sectors was assessed by employing multivariate regression models using aggregate NPA ratio for each sector separately. The dependent variables consisted of lagged NPAs, sectoral GDP growth, inflation, and short-term interest rate.

  Derivation of the NPAs and CRAR from the slippage ratios, which were projected from the above mentioned credit risk econometric models, were based on the following assumptions: credit growth of 15 per cent; recovery rate of 5.6 per cent, 6.3 per cent, 6.3 per cent and 9.6 per cent, during June, September, December and March quarters, respectively; write-offs rate of 3.3 per cent, 3.8 per cent, 4.6 per cent and 5.2 per cent, during June, September, December and March quarters, respectively; risk weighted assets growth of 18 per cent, and profit growth assumed to be at 15 per cent, 5 per cent and -5 per cent under baseline, medium risk and severe risk, respectively. The regulatory capital growth is assumed to remain at the minimum by assuming minimum mandated transfer of 25 per cent of the profit to the reserves account. The distribution of new NPAs in various sub-categories was done as prevailing in the existing stock of NPAs. Provisioning requirements for various categories of advances are 0.4 per cent for standard advances, 20 per cent for sub-standard advances, 75 per cent for doubtful advances, and 100 per cent for loss advances. The projected values of the ratio of the non-performing advances were translated into capital ratios using the "balance sheet approach", by which capital in the balance sheet is affected via the provisions and net profits. It is assumed that the existing loan loss provisioning coverage ratios remain constant for the future impact.

Single Factor Sensitivity Analysis – Stress Testing

As a part of quarterly surveillance, stress tests are conducted covering credit risk, interest rate risk, liquidity risk etc. Resilience of the commercial banks in response to these shocks is studied. The analysis covers all scheduled commercial banks..

Credit Risk

To ascertain the resilience of banks, the credit portfolio was given a shock by increasing NPA levels, for the entire portfolio as well as for select sectors, along with a simultaneous increase in provisioning requirements. For testing the credit concentration risk, default of the top individual borrower and the largest group borrower is assumed. The estimated provisioning requirements so derived were adjusted from existing provisions and the residual provisioning requirements, if any, were deduced from banks' capital. The analysis was carried out both at the aggregate level as well as at the individual bank level, based on supervisory data as on March 31, 2013. The scenario assumed enhanced provisioning requirements of 1 per cent, 30 per cent and 100 per cent for standard, sub-standard and doubtful/loss advances, respectively. The assumed increase in NPAs was distributed across sub-standard, doubtful and loss categories in the same proportion as prevailing in the existing stock of NPAs. The additional provisioning requirement was applied to the altered composition of the credit portfolio.

Interest rate risk

The fall in value of the portfolio or income losses due to the shifting of INR yield curve are accounted for the total loss of the banks because of the assumed shock. The estimated total losses so derived were reduced from the banks' capital.

For interest rate risk in the banking book, Duration Analysis approach was considered, for computation of the valuation impact (portfolio losses) on the investment portfolio. The portfolio losses on investments were calculated for each time bucket based on the applied shocks. The resultant losses/gains were used to derive the impacted CRAR. The valuation impact for the tests on banking book was calculated under the assumption

that the HTM portfolio would be marked to market. In a separate exercise for interest rate shocks in trading book, the valuation losses were calculated for each time bucket on the interest bearing assets using duration approach.

Liquidity Risk

The aim of liquidity stress tests is to assess the ability of a bank to withstand unexpected liquidity drain without taking recourse to any outside liquidity support. The analysis is done as at end-March 2013. The scenario depicts different proportions (depending on the type of deposits) of unexpected deposit withdrawals on account of sudden loss of depositors' confidence and assesses the adequacy of liquid assets available to fund them.

Assumptions in the liquidity stress test are as follows:

- It is assumed that banks would meet stressed withdrawal of deposits through sale of liquid assets only.
- The sale of investments is done with a hair cut of 10 per cent of their market value.
- The stress test is done on a static mode.

Stress Testing of Derivatives Portfolio of Select Banks

The stress testing exercise focused on the derivatives portfolio of a representative sample set of top 22 banks in terms of notional value of derivatives portfolio. Each bank in the sample was asked to assess the impact of stress conditions on their respective derivatives portfolios.

In case of domestic banks, the derivatives portfolio of both domestic and overseas operations was included. In case of foreign banks, only the domestic (i.e. Indian) position was considered for the exercise. For derivatives trade where hedge effectiveness was established was exempted from the tests, while all other trades were included.

The stress scenarios incorporated four sensitivity tests consisting of the spot USD/INR rate and domestic interest rates as parameters

Table: Shocks for Sensitivity Analysis

	Domestic Interest Rates	
Shock 1	Overnight	**+250 bps**
	Upto 1yr	**+150 bps**
	Above 1yr	**+100 bps**

	Domestic Interest Rates	
Shock 2	Overnight	**-250 bps**
	Upto 1yr	**-150 bps**
	Above 1yr	**-100 bps**

	Exchange rates	
Shock 3	USD/INR	**+20 per cent**

	Exchange Rates	
Shock 4	USD/INR	**-20 per cent**

Scheduled Urban Co-operative Banks

Credit Risk

Stress tests on credit risk were conducted on Scheduled Urban Co-operative Banks (SUCBs) using their asset portfolio as at end-March 2013. The tests were based on single factor sensitivity analysis. The impact on CRAR was studied under two different scenarios. The assumed scenarios were as under:

- Scenario I: 50 per cent increase in gross NPAs.
- Scenario II: 100 per cent increase in gross NPAs.

Liquidity Risk

Liquidity stress test based on cash flow basis in 1-28 days time bucket was also conducted, where mismatch [negative gap (cash inflow less than cash outflow)] exceeding 20 per cent of outflow was considered stressful.

- Scenario I: Cash out flows in 1-28 days time bucket goes up by 50 per cent (no change in cash inflows).
- Scenario II: Cash out flows in 1-28 days time bucket goes up by 100 per cent (no change in cash inflows).

Non-Banking Financial Companies

Credit Risk

Stress tests on credit risk were conducted on Non-Banking Financial Companies (includes both Deposits Taking and Non-Deposit taking and Systemically Important) using their asset portfolio as at end-December 2012. The tests were based on single factor sensitivity analysis. The impact on CRAR was studied under two different scenarios;

- Scenario I: GNPA increased two times from the current level.
- Scenario II: GNPA increased 5 times from the current level.

The assumed increase in NPAs was distributed across sub-standard, doubtful and loss categories in the same proportion as prevailing in the existing stock of NPAs. The additional provisioning requirement was adjusted from the current capital position. The stress was conducted at individual NBFCs as well as at an aggregate level.