Financial Stability Report

Reserve Bank of India
December 2010

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Foreword

This second edition of the *Financial Stability Report* (FSR) reflects the Reserve Bank's continuing endeavour to communicate our assessment of the incipient risks to financial sector stability. The objective is to interpret and assess disparate elements of the financial sector eco-structure – the macroeconomic setting, policies, markets, institutions – holistically from a systemic risk perspective.

Since the publication of the first FSR in March 2010, the differential in the pace of recovery between the advanced economies and the emerging market economies (EMEs) has further widened. In India, growth has rebounded strongly but inflationary pressures persist, driven both by domestic demand and increasing global commodity prices.

The policy agenda in most EMEs in recent months has been dominated by the management of capital flows. India's dilemma is somewhat contrarian to this. Our concern has been not so much the quantum of flows, which we have been able to absorb because of the widened current account deficit, but rather the nature of these flows. Much of the capital has come in the form of short term portfolio flows and debt flows which are significantly prone to sudden stops and reversals. While the level of reserves has imparted strength to our balance of payments, there has not been much accretion to reserves over the past several months which could alter the equation if global patterns of capital flows change significantly.

India's financial sector has by and large remained resilient save for some strains in the money market on account of tight liquidity. Banks continue to be well capitalised and the asset quality at the aggregate level does not cause serious concerns. The Reserve Bank will continue to monitor and address sectoral exposures as in the past. Effective management of asset-liability mismatches by banks, particularly in view of large long-term infrastructure related exposures, would be a key challenge to be addressed. The Reserve Bank is continuing its efforts to strengthen the prudential framework for banks and non-banking financial institutions. Strengthening the regulation of systemic linkages of large NBFCs and addressing regulatory gaps in the non-banking space would be key focus areas.

There have been significant efforts at both domestic and international levels to strengthen and preserve financial stability. This FSR presents, *inter alia*, an assessment of the Indian position on financial stability relative to the reform agenda being contemplated internationally. It highlights that the adjustment needed to comply with many of these reforms is not likely to stretch our banking system unduly since several of the key prudential safeguards are already part of the domestic regulatory framework. The extended implementation schedules will also ease the adjustment process. However, the space for future capital requirements for banks in a growing economy needs to be taken into account in evaluating the impact of the reforms on the Indian system. There remain important challenges which the regulators, financial market participants and all stakeholders will have to collectively address.

The Financial Stability and Development Council (FSDC) that the Finance Minister mooted in the budget in February 2010 is taking shape. The Reserve Bank's role in it would expectedly be critical. Meanwhile, considerable efforts have been made within the Reserve Bank to upgrade the methods and techniques for assessing the health of the financial system and for identifying and analysing potential risks to systemic stability. This FSR presents the results of some of these efforts.

Pursuit of financial stability is a continuing endeavour - much like the Greek mythological character Sisyphus, who has been likened to central bankers in a recent best seller "*Lords of Finance*". Sisyphus was condemned by the Gods to roll a huge boulder up a steep hill, only to watch it roll down again and having to repeat the task. The challenge for Central bankers is still bigger – they have to manage multiple boulders at a time. Only if central banks succeed in that multi-Sisyphean effort will they be able to keep the dynamic system stable.

We hope this Report would provide useful insights and information to all stakeholders. The Reserve Bank is keen on improving the quality of analysis and presentation in the FSR. Towards this end, we sincerely solicit views, comments and feedback on this Report at fsu@rbi.org.in.

Mumbai
December 30, 2010

D. Subbarao
Governor

List of Select Abbreviations

ABS	Asset Backed Securities
ACR	Asset Coverage Ratio
ADR	American Depository Receipt
ALM	Asset Liability Management
Bankex	Bombay Stock Exchange's Banking Index
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
BPSS	Board for Regulation and Supervision of Payment and Settlement systems
BRIC	Brazil, Russia, India and China
BSE	Bombay Stock Exchange
CAD	Current Account Deficit
CAMEL	Capital, Asset quality, Management, Earning, Liquidity
CASA	Current Account Savings Account
CBLO	Collateralised Borrowing and Lending Obligation
CCIL	Clearing Corporation of India Limited
CCP	Central Counterparty
CD	Certificates of Deposit
CDS	Credit Default Swap
CFSA	Committee on Financial Sector Assessment
CGFS	Committee on the Global Financial System
CIBIL	Credit Information Bureau of India Limited
CP	Commercial Paper
CPS	Convertible Preference Shares
CPSS	Committee on Payment and Settlement System
CRA	Credit Rating Agency
CRE	Commercial Real Estate
CRAR	Capital to Risk-weighted Assets Ratio
CRR	Cash Reserve Ratio
DCCB	District Central Cooperative Bank
DD	Distress Dependence
DER	Debt- Equity Ratio
DICGC	Deposit Insurance and Credit Guarantee Corporation
DIF	Deposit Insurance Fund
DoE	Duration of Equity
DSCR	Debt Service Coverage Ratio
DTL	Demand and Time Liabilities
DvP	Delivery Vs. Payment
ECB	External Commercial Borrowing
EFSF	European Financial Stability Fund
ELD	Equity Linked Debentures
EM	Emerging Market
EME	Emerging Market Economy
EMP	Exchange Market Pressure
ESM	European Stabilisation Mechanism
ETF	Exchange - Traded Fund
EXIM Bank	Export Import Bank
EU	European Union
FAO	Food and Agriculture Organisation
FASB	Financial Accounting Standards Board
FC	Financial Conglomerate
FI	Financial Institution
FII	Foreign Institutional Investor
FMP	Fixed Maturity Plan
FPO	Follow-on Public Offering
FSAP	Financial Sector Assessment Programme
FSB	Financial Stability Board
FSDC	Financial Stability and Development Council
FSI	Financial Stress Indictor
FSR	Financial Stability Report
FSU	Financial Stability Unit
G 7	Group of Seven Industrialised Nations

GAAP	Generally Accepted Accounting Principles
GARCH	Generalised Auto Regressive Conditional Heteroskedasticity
GDP	Gross Domestic Product
GDS	Gross Domestic Savings
GFSR	Global Financial Stability Report
GIMF	Global Integrated Monetary and Fiscal Model
HFC	Housing Finance Company
HFT	Held for Trading
HLCCFM	High Level Coordination Committee on Financial Markets
HTM	Held to Maturity
IADI	International Association of Deposit Insurers
IASB	International Accounting Standards Board
ICAI	Institute of Chartered Accountants of India
ICT	Information and Communication Technology
ID	Investment to Deposit
IDFC	Infrastructure Development Finance Company
IDL	Intra-day Liquidity
IDRBT	Institute for Development and Research in Banking Technology
IFRS	International Financial Reporting Standards
IIF	Institute for Industrial Finance
IIFCL	Indian Infrastructure Finance Company Limited
IIP	Index of Industrial Production
IMF	International Monetary Fund
INR	Indian Rupee
INFINET	Indian Financial Network
IOSCO	International Organisation of Securities Commissions
IRS	Interest Rate Swaps
IRDA	Insurance Regulatory and Development Authority
IPO	Initial Public Offering
IPRE	Income Producing Real Estate
ISDA	International Swaps and Derivatives Association
IT	Information Technology
LAB	Local Area Bank
LAF	Liquidity Adjustment Facility
LBO	Leveraged Buy-Outs
LCR	Liquidity Coverage Ratio
LCFIs	Large and Complex Financial Institutions
LoLR	Lender of Last Resort
LSOs	Loan Sell-offs
LTV	Loan To Value
MCA	Ministry of Corporate Affairs
MF	Mutual Fund
MFI	Microfinance institution
MMMF	Money Market Mutual Fund
MIBOR	Mumbai Interbank Offered Rate
MICR	Magnetic Ink Character Recognition
MIFOR	Mumbai Interbank Forward Rate
MOU	Memorandum of Understanding
MPI	Macro Prudential Indicators
MSCI	Morgan Stanley Capital International
MSS	Market Stabilisation Scheme
MTM	Mark-to-Market
NABARD	National Bank for Agricultural and Rural Development
NBFC	Non-Banking Financial Company
NBFC AFC	NBFC-Asset Finance Company
NBFC-D	Deposit taking NBFC
NBFC-ND-SI	Non-Banking Financial Company-Non Deposit taking-Systemically Important
NBFC-SI	Non-Banking Financial Company-Systemically Important
NBFIs	Non-Banking Financial Institutions
NCD	Non-Convertible Debenture
NDF	Non-Deliverable Forward
NHB	National Housing Bank

NOC	No Objection Certificate
NPA	Non-Performing Asset/Advances
NSCCL	National Securities Clearing Corporation Ltd
NSE	National Stock Exchange
NSFR	Net Stable Funding Ratio
OBS	Off-Balance Sheet
OECD	Organisation for Economic Co-operation and Development
OIS	Overnight Indexed Swap
OMO	Open Market Operation
OTC	Over The Counter
P/E	Price to Earnings Ratio
PEF	Private Equity Funds
PACS	Primary Agricultural Credit Society
PCARDB	Primary Cooperative Agriculture and Rural Development Bank
PCR	Provision Coverage Ratio
PLR	Prime Lending Rate
PMI	Purchase Managers Indices
PMD	Portfolio Multivariate Density
PSB	Public Sector Bank
PSS	Payment and Settlement Systems
QE	Quantitative Easing
QIP	Qualified Institutional Purchases
QIS	Quantitative Impact Study
REE	Real Estate Exposures
REER	Real Effective Exchange Rate
RoA	Return on Assets
RoE	Return on Equity
RRB	Regional Rural Bank
RRPs	Recovery and Resolution Plans
RSA	Rate Sensitive Asset
RSL	Rate Sensitive Liability
RTGS	Real Time Gross Settlement
RWA	Risk-Weighted Assets
S&P	Standard & Poor's
SCARDB	State Cooperative Agriculture and Rural Development Bank
SCB	Scheduled Commercial Bank
SEBI	Securities and Exchange Board of India
SENSEX	Bombay Stock Exchange Sensitive Index
SI	Systemically Important
SIDBI	Small Industries Development Bank of India
SIFI	Systemically Important Financial Institution
SLB	Stock Lending and Borrowing
SLR	Statutory Liquidity Ratio
SMFST	Systemic Macro-Financial Stress Test
SOL	Single Order Limit
SPV	Special Purpose Vehicle
SRM	Systemic Risk Monitor
StCB	State Cooperative Bank
SUCB	Scheduled Urban Co-operative Bank
TA	Total Assets
TAFCUB	Task Force for Urban Co-operative Banks
TB	Treasury Bill
TD	Total Deposits
TI	Total Investments
TIPS	Treasury Inflation Protection Securities
TNW	Tangible Net Worth
TOL	Total Outside Liability
UCB	Urban Co-operative Banks
UTI	Unit Trust of India
VaR	Value at Risk
VAR	Vector Auto Regressive
VCF	Venture Capital Fund
VIX	Volatility Index
WEO	World Economic Outlook
Y-o-Y	Year-on-Year

Chapter I
Assessment and Outlook

Growth has rebounded strongly in the Indian economy while financial conditions remained stable since the publication of the first Financial Stability Report (FSR) in March 2010. Notwithstanding intermittent volatility, especially in equity and foreign exchange markets, driven primarily by exogenous developments, the financial sector remained stress-free. This is also displayed by the Financial Stress Indicator for India, which was introduced in the first FSR. Financial institutions remained healthy, credit offtake has picked up, as has profitability, especially in the first half of 2010-11. The Banking Stability Index points to a healthy improvement in the stability of the banking sector over the past few years. This is corroborated by the results of a range of stress tests undertaken by the Reserve Bank. A number of regulatory measures were announced with a view to tightening the prudential infrastructure, plugging gaps in regulation and ensuring that regulatory and supervisory set up reflected international best practices.

Some soft spots are, however, discernible. The current account deficit is widening while capital flows continue to be dominated by volatile components. External sector ratios have deteriorated, fiscal conditions are still under pressure and inflationary pressures persist. Liquidity conditions tightened beyond the Reserve Bank's comfort level though some policy measures have recently been taken to alleviate the stress. Some issues in the financial market microstructure will need to be addressed. Asset quality of banks and their ALM position continue to warrant monitoring. Regulatory gaps in the non-banking financial sector will need to be plugged. A robust macroprudential framework for the identification of systemic risks will need to be set up. Convergence with the emergent international reforms agenda presents challenges and will require careful calibration.

The tail risks to financial stability are largely exogenous given increasing correlation between global growth and that of EMEs, including India. The finance channel has assumed greater importance increasing the pace and degree of contagion from disturbances abroad. Similarly, business cycle synchronisation of the Indian economy with most of the advanced economies and other EMEs has increased. With both financial and real sector still under stress in advanced economies, the country will have to guard against vulnerabilities arising from risks to global growth and financial stability.

The Global environment

Global economic recovery remains uncertain

1.1 Global economic recovery continues to be uneven and uncertain with downside risks remaining significant. With fiscal stimulus slowly being phased out in advanced economies, private consumption and investment, both of which remain weak in these economies, need to take up the slack seamlessly.

A prolonged low interest rate regime in advanced countries has the potential to increase systemic leverage

1.2 Policy rates in advanced economies are low and are likely to remain so for a protracted period. A prolonged low interest rate regime reduces the opportunity cost of capital and potentially increases forbearances in credit markets and encourages higher systemic leverage. It also creates a yield-seeking environment wherein the investors get into 'crowded trades', including investments in emerging market assets. In times of stress, unwinding of such trades can cause a disorderly correction in asset prices.

Capital flows beyond absorption capacity could create imbalances

1.3 In contrast to advanced economies, in many emerging markets including India, both consumption and investment are fuelling demand and contributing to strong growth. As output nears potential in these economies, monetary accommodation is being withdrawn and policy rates raised to near-neutral levels. The two-track global recovery and divergent course of monetary policy actions have created push and pull factors for large capital inflows into EMEs. Such capital flows have the potential to create imbalances in

domestic financial markets, especially if they exceed the country's absorption capacity. They also leave the country vulnerable to sudden reversals that destabilise the domestic financial markets and the broad economy.

Structural factors behind global imbalances need addressing

1.4 Current account deficits continue to persist in the advanced economies, particularly the United States, though they are expected to narrow down somewhat in 2011. Some of these economies have also been recording high fiscal deficits before and after the crisis. To prevent reemergence of global imbalances, rebalancing from public to private demand in advanced economies and from external to domestic demand in key emerging economies is imperative.

Tensions over currency valuations could escalate

1.5 Easy monetary policy, especially in the US, has led to a weaker US dollar. Several economies in advanced and emerging markets, have reportedly stepped up intervention in the foreign exchange market in a bid to arrest the appreciation of their respective currencies. This has raised the risks of tensions over currency valuations, especially among countries enjoying large current account surpluses with the US.

Fiscal profligacy can disrupt sovereign debt markets and threaten financial stability

1.6 Turbulence in sovereign debt markets in May 2010 and again in recent months has strongly underscored the importance of credible medium-term fiscal consolidation plans for ensuring financial stability. Unfolding market developments clearly demonstrate the strong potential of problems in one country spilling over to other similarly vulnerable nations and to the global economy in general. In particular, the crisis highlighted the limitations imposed by a unified currency (the Euro) in conducting monetary policy tailored to the specific needs of individual jurisdictions leaving the burden of adjustments to fiscal policy. Significant amounts of sovereign debt, especially in European countries, are maturing in the next few years and any renewed turbulence could severely impair the fragile global recovery.

Global banking system is more resilient but funding risks remain

1.7 Since the outset of the financial crisis, financial institutions globally have worked their way through large losses, strengthened capital and liquidity buffers and have lowered leverage. The improvements have, however, yet to fully normalise conditions in bank funding markets. Weaker banks remain dependent on support from central banks and governments. Banks face a major refinancing challenge given the 'wall of redemptions' in the next few years. Strains could emerge as they compete with sovereigns in bond markets. Funding problems could also arise for specific institutions, prompted by renewed stress in sovereign debt markets or downside surprises to economic activity. The problems could quickly become more widespread given the complex linkages of institutions and markets within and across borders.

1.8 A more recent threat has emerged from alleged irregularities in mortgage documents in the US housing markets. If documentation problems prove to be pervasive and, more importantly, throw into doubt the ownership of not only foreclosed properties but also pooled mortgages, the consequences could be severe.

Domestic outlook and assessment

Growth buoyant, but downside risks remain

1.9 Buoyed by strong domestic demand, GDP growth rates have rebounded after some moderation in the aftermath of the global financial crisis. Going forward, the growth momentum is expected to be sustained by increased corporate capital expenditure, infrastructure investments and strong consumption demand. Downside risks remain, especially if global recovery falters, given the greater integration of the domestic economy with the global economy. Persistent accommodative policy in the advanced nations leading to a weak US dollar could impact exports.The key domestic challenges include the widening gap between savings and investment rates and the constraints placed by the availability of infrastructure.

Inflation in India has some structural basis

1.10 Inflation, particularly food inflation, in India continues to rule at elevated levels reflecting in part the structural demand-supply mismatches resulting from, *inter alia*, rising incomes and changing consumption patterns. Non-food manufacturing inflation remains above trend though some moderation has been a welcome development. The recent upswing in food and commodity prices at the global level is also a concern for domestic inflation, going forward. Monetary policy has been tightened. This, along with

the stressed liquidity conditions, has caused short term rates to harden. The increased frequency of policy reviews should help manage expectations and reduce uncertainties.

Stressed liquidity conditions warrant caution

1.11 Liquidity conditions remain tight. The liquidity stress arose initially due to payouts to the Government in respect of telecom auctions. Strains continued to prevail on account of rising large government cash balances, accentuated by rising currency in circulation and faster growth of advances compared to deposits. While the tight liquidity conditions have aided the transmission of monetary policy, excessive deficits induce unpredictability in both availability and cost of funds, making it difficult for the banking system to sustain credit delivery. Several measures have recently been taken (announcement of OMO purchases of government securities of ₹48,000 crore and a permanent reduction in SLR to 24 per cent) to alleviate the tight liquidity conditions. The liquidity situation will require watchful management in the coming months.

Sovereign debt and fiscal deficit, though under control, still remain a concern

1.12 On the fiscal front, though high fiscal deficit is perceptibly worrisome, it has not been considered a major source of vulnerability due to strong growth rates and the fact that India predominantly funds its deficit through domestic sources. The Government has, in the Union Budget for 2010-11, announced a road map for a return to fiscal consolidation and measures for fuel price liberalisation and proposed tax reforms are expected to aid this process. Going forward, fiscal consolidation will necessitate focusing on the 'quality of adjustment', which involves substantial expenditure compression under-pinned by revenue-led correction while ensuring that capital outlay to aid medium-term growth prospects is not affected.

Management of capital flows poses challenges

1.13 Accelerated capital flows to the economy have helped finance the widening current account deficit. However, a potentially worrying feature of capital flows to India has been the dominance of portfolio flows and debt flows as compared to the more stable investment flows on gross basis. Such flows require watchful management as they are prone to sudden stops and reversals.

External debt ratios of the country require careful management

1.14 Increasing international liabilities have resulted in a worsening net international investment position of the country with the ratio of short term external debt to foreign exchange reserves and of total external debt to foreign exchange reserves having risen to their highest level since the foreign exchange crisis during the early 1990s.

Developments in the housing sector have prompted tightening of prudential norms

1.15 House prices have risen sharply in some pockets and the sector remains susceptible to asset price booms. Alluring housing loan schemes offered to the banking system clientele could also be aiding demand in the sector. Against this backdrop, the Reserve Bank has tightened the prudential norms for housing credit.

Household and corporate balance sheets are healthy

1.16 Household and corporate leverage remained low especially relative to norms in the advanced economies. The Industrial Outlook survey also points to an improvement in business sentiments. A few concerns arise in respect of banks' exposures to some industry segments/firms which are highly leveraged. Overall, there was an improvement in the quality of the retail portfolio of banks which points to a possible improvement in the health of households though the level of retail NPAs remains high.

Financial Markets

1.17 Domestic financial markets remained stress-free but susceptible to large external shocks. Looking ahead, the Financial Stress Indicator (FSI) anticipates that conditions are likely to remain orderly over the next three months. However, a few market microstructure issues need attention.

Efficacy of the LAF corridor needs to be improved

1.18 Recourse to liquidity under LAF is dependent upon availability of government securities in excess of mandatory Statutory Liquidity Ratio (SLR) holdings. Since the distribution of excess SLR holdings is not uniform across banks, those short on funds and excess SLR securities have to depend upon other banks to access funds from the Reserve Bank. At times, such indirect access is constrained by availability of limits -

interbank as well as regulatory (lending and borrowing as a proportion of capital funds) limits and banks' own contingency liquidity assessments. In view of such market microstructure issues, the call money rates often breach the LAF corridor when liquidity conditions are beyond the "comfort zone". The Reserve Bank has constituted a Working Group to examine the gamut of issues related to the operating procedures of monetary policy.

Need for a well-developed term structure in money markets

1.19 The money markets in India, including interbank markets, are well regulated. The inter-bank market is largely collateralised but restricted to the overnight tenor. Term money market has not developed on account of the unique circumstances and structure of the financial system. Banks, though, have been raising term funding through Certificate of Deposits (CDs) and bulk deposits. Compared to the term money market, volumes in the CD market are high and growing. However, dependence of banks on such wholesale funding for credit creation is not excessive. If the CD market gets more standardised and there is greater transparency in secondary market trades in CDs, it may promote development of a credible term structure /benchmark.

Deeper and more liquid bond markets desirable

1.20 Bond markets in India and elsewhere in EMEs are characterised by lack of incentives to trade actively. A supply-heavy market on account of large government borrowings is a key factor behind the lack of active trading interest. Moreover, banks and insurance companies are statutorily required to maintain a relatively high proportion of their liabilities in approved securities, mainly government bonds. For financial stability reasons, regulations allow banks in India to hold the entire mandated proportion under the Held-till-Maturity (HTM) category which also reduces the tradeable portion of securities portfolio held by banks.

Increased integration of foreign exchange markets

1.21 The exchange rate of the Indian rupee displayed two-way movement consistent with the Reserve Bank's policy of maintaining orderly conditions in the market rather than targeting any level of the exchange rate. The Reserve Bank's exchange rate policy is designed so as not to intervene in foreign exchange markets if capital flows are "driven by changing economic fundamentals". Increased correlation across markets and faster and easier "pass through" of global disturbances to the domestic markets have led to higher volatilities in the domestic foreign exchange market relative to past years. At the same time, the real sector's ability to hedge the concomitant risks have been enhanced through liberalisation and introduction of hedging products, though the costs of hedging could increase with increased volatility.

Growth of the offshore market

1.22 A recent survey conducted by the BIS points to the rising share of the Rupee offshore non-deliverable market. A large offshore market which interacts with the domestic market raises some systemic concerns since flows arising abroad out of transactions that are not permissible onshore find resonance in the domestic foreign exchange market. Moreover, transactions in these markets are non-transparent and outside the regulatory ambit. A large offshore market, therefore, constrains the systemic regulator's actions for maintaining orderly conditions in the domestic market.

Concentration in few segments

1.23 Some segments of the interest rate market exhibit significant concentration. Market activity in the interest rate swap and, to a lesser extent, in the government bond market is dominated by a small number of banks. While such concentration is not uncommon even in advanced countries, in India, trading is concentrated mostly in banks with smaller balance sheets. As a consequence, the risk taking ability of the system is low and the market remains prone to bouts of illiquidity. Higher participation by 'larger' banks (in terms of balance sheet size) is desirable for market liquidity and vibrancy.

Market development – an ongoing process

1.24 As the economy matures, new and more complex products will need to be introduced in a calibrated manner. In recent times, interest rate futures, STRIPS, currency futures and repo in corporate bonds have been introduced while work is underway for introducing some others like credit default swaps and futures on shorter dated securities. Measures that are being considered to enhance the depth and liquidity of corporate bond markets in India include proposals to remove withholding tax on FII investment, relaxation of rating and net worth criteria for the insurance sector and

relaxation of stamp duties. Introduction of each new product would need to be of value to the real economy and concomitant with the introduction of prudent guidelines, a robust market infrastructure and a systemic monitoring framework for these new markets.

Financial Institutions

Financial sector remained resilient but vigilance on asset quality and liquidity is needed

1.25 The financial sector in India remained resilient. The Banking Stability Index points to a healthy improvement in the stability of the banking sector over the past few years, though the dimensional risk associated with the liquidity of scheduled commercial banks (SCBs) has increased. Capital adequacy ratios of SCBs were well above the regulatory requirements – both from a micro and a systemic perspective. Credit offtake improved with rebound in economic growth. Credit acceleration was evidenced across segments. However, it was particularly marked in case of infrastructure advances and retail credit. Increase in advances in both these segments has to be viewed with caution. A growing portfolio of infrastructure finance could aggravate asset liability mismatches despite the presence of mitigants, while in the retail sector, high levels of NPAs persist. Liquidity conditions could be impacted as the incremental credit deposit ratio accelerated in recent quarters with credit growth outpacing deposit growth.

Asset quality needs to be monitored

1.26 Asset quality continued to pose some concerns as the growth in NPAs outstripped growth in advances leading to a deterioration of gross NPA ratios. These ratios deteriorated despite increased write offs and one time settlements. Doubtful and loss assets comprised over 50 per cent of the stock of NPAs indicating the preponderance of sticky advances.

1.27 Recently, some concerns had arisen in respect of real estate firms allegedly involved in the loan syndication bribery case and the fallout of investigations in regard to issuance of 2G telecom licenses on bank exposures to telecom companies. Detailed enquiries have been undertaken though preliminary findings do not point to widespread irregularities or systemic concerns. However, there could be a potential impact on the flow of credit to these sectors as banks adopt a more cautious approach to lending to these segments of the economy.

Provision coverage ratio met in aggregate, some laggards

1.28 The Reserve Bank, as a countercyclical requirement, had announced that all scheduled commercial banks would be required to maintain a provision coverage ratio of 70 per cent by September 2010. The banking sector, in the aggregate, has met the regulatory requirement though the coverage ratio was yet to be met by the public sector banks, as a whole.

Infrastructure loans could heighten ALM risks though there are mitigants

1.29 From a longer term perspective, the maturity profile of the deposits, advances and investments of banks indicates concentration of shorter term deposits as against deployment of credit in the medium to long term tenure implying presence of inherent structural mismatches in their balance sheets. These trends are primarily driven by the growing share of infrastructural lending in total advances of banks. There are, however, mitigants in the form of high share of low cost CASA deposits and interest rate reset clause stipulated by banks. Further, several initiatives taken recently viz., introduction of repos in corporate bonds, facilitating take out financing, proposed infrastructure debt funds, enhancement in the limit for FII investment in government securities and corporate bonds and the proposed introduction of single name CDSs are expected to improve the flow of finance to the infrastructure sector reducing the pressure on banks to take on increasing quantities of long term credit exposure to this sector.

Off balance sheet (OBS) exposures of foreign banks warrants monitoring

1.30 The OBS exposures of foreign banks increased, warranting careful monitoring, especially as foreign banks account for the bulk of OBS exposures of SCBs. The credit equivalent of these exposures, however, remained low.

A robust co-operative banking sector is critical for financial inclusion

1.31 The co-operative sector remains critical for greater financial inclusion in the country. Multifaceted

efforts at reorganisation of the sector (for example through mergers and amalgamations), recapitalisation, intensive supervision, etc. have led to some improvement in the performance and financial soundness parameters of this segment though some concerns on this front remain. While the segment is not systemically important in terms of size, past instances have amply demonstrated the significant impact any failure in the segment can have on market sentiments about the financial sector with downstream impact on its smooth functioning.

Regulatory environment

The proposed capital rules – some challenges but the banking system not likely to be unduly stretched

1.32 The Basel III proposals reflect the lessons from the crisis and are expected to be "quite game changing". In particular, for emerging economies like India, the implementation comes at a time when the credit demand will remain strong given, *inter alia*, the compulsions of robust growth, the investment needs of infrastructure and the demand ushered in by increasing financial inclusion. However, the comfortable capital adequacy position of the banks in India vis-à-vis Basel II norms means that the Basel III requirements, once fully calibrated, are not likely to be very much higher than the current position. Nevertheless, there could be shortfalls, at the level of individual banks, which would necessitate raising additional capital. The extended implementation schedule for the requirements is expected to ease the transition. Additional capital requirements by public sector banks, if any, could also necessitate recapitalisation by the Government with resultant impact on the total internal debt.

Leverage and liquidity norms not binding constraints but pose some challenges

1.33 The Basel III requirements in respect of leverage and liquidity are also not expected to unduly stretch banks in India. However, constraints in the availability of accurate and timely data and absence of historical episodes of significant liquidity stress in the Indian context means that formulating and predicting liquidity stress scenarios with reasonable accuracy and consistency, as is required under the proposed rules, is going to be difficult.

Identifying objective alternatives to CRAs presents difficulties while the regulatory framework needs to be strengthened

1.34 In India, the Reserve Bank has been emphasising that banks should carry out their own assessment and not rely on ratings exclusively. There are, however, several issues with reducing such reliance. In particular, the reliance of banks on external ratings for arriving at their capital requirements using the Standardised Approach under Basel II is likely to continue in many jurisdictions, including India. CRAs in India are regulated by SEBI. SEBI's jurisdiction over the CRAs, however, only extends to their activities in securities market. It is thus imperative that the accreditation process of rating agencies in respect of activities coming under other regulators and the rating methodology employed for such activities is looked into by the regulator concerned. In respect of banks, the Reserve Bank does accredit CRAs as External Credit Assessment Institutions based on a rigorous evaluation.

Critical accounting standards are currently moving targets and convergence may pose difficulties

1.35 Phased road maps for convergence with the International Financial Reporting Standards (IFRSs) for corporates and banks in India has been announced. The convergence programme could be a major challenge in view of, *inter alia*, the rigorous requirements for skill upgradation and changes in IT systems. This was observed in the previous FSR and needs re-iteration. Also, IFRS 9 relating to Financial Instruments, which is very crucial for banks, is still evolving and the final standard is unlikely to be available before the middle of 2011. The Reserve Bank has constituted a Working Group to address the implementation issues and facilitate formulation of operational guidelines for the convergence.

The supervisory structure for financial conglomerates (FC) will have to draw on international policy developments

1.36 The current supervisory structure for FCs which encompasses a two-pronged approach of off-site surveillance and periodic interface with the conglomerates has proved quite robust in assessing the risks faced by these institutions. Going forward, international regulatory requirements may not immediately mandate separate prudential

requirements for the large Indian firms, as none of them are likely to be considered systemically important globally. Regardless, policies for FCs will need to be strengthened drawing on international policy developments on SIFIs. The legal and operational framework for orderly resolution of institutions, more so for complex financial institutions, will need to be strengthened. A Working Group is examining the feasibility of a holding company model for FCs having banks as well as non-banks.

Nature of incorporation of foreign banks needs careful consideration

1.37 Issues with respect to the operating structure i.e. branch versus wholly owned subsidiary, of foreign banks in India will need careful consideration. From the financial stability angle, the subsidiary model is the preferred approach as it provides effective regulatory control, ring fencing of capital and clearer resolution in case of bankruptcy.

NBFCs vis-a-vis banks – a few avenues for regulatory arbitrage remain

1.38 Internationally, tightening of the regulatory regime for the banking sector has raised the possibility of increased regulatory arbitrage vis-à-vis the non-banking financial sectors. In India, too, this remains an area where vigilance will need to be continuously exercised in view of the strong cross-linkages between the various segments of the financial sector. This is particularly so in the current environment when NBFCs (especially systemically important non-deposit taking NBFCs) are expanding rapidly and both interconnectedness and product competition across types of institutions are intensifying. Several initiatives have been taken to tighten the regulatory framework for NBFCs which include, *inter alia,* imposition of prudential norms as applicable to banks to the non-banking sector.

Entity regulation could leave regulatory gaps which need to be addressed

1.39 Multiple regulators for non-banking financial entities in the country and an entity based approach to regulation gives rise to possible regulatory gaps – functional activities remaining unregulated, gaps in regulation permitting surrogate raising of public funds, leveraged activities by entities like merchant banks, portfolio managers and brokerages not being subject to prudential regulation. These will need to be urgently addressed.

Microfinance institutions (MFIs) – recent concerns warrant closer examination

1.40 In the wake of the legislation by the Government of Andhra Pradesh and the serious concerns in the methods of operations of MFIs, particularly the large for-profit companies, bank loans to these entities which is a significant source of funding, is likely to be impacted. Fresh disbursements have come to a standstill while the recovery rate of the NBFC-MFIs has come down sharply. The impact of non-recovery of MFI loans spilling over to other states and to other channels, including bank lending through Self Help Groups, cannot be ruled out. Given the total outstandings of banks, it is not yet a systemic issue as far as bank balance sheets are concerned. However, the recent developments are bound to impact the MFI-model in a significant way. The Malegam Committee is looking into all the issues and is expected to come out with its recommendations shortly.

Network connectivity important for ascertaining systemic vulnerabilities

1.41 Interconnectedness between various segments of the financial markets and among financial market participants has emerged as an important element of macroprudential supervision. Closer supervision of institutions which are highly interconnected in payment and settlement systems or through inter-bank liabilities is warranted. A systemic regulator would require sophisticated network tools to rigorously study the complex nature of functioning of interconnected financial systems.

Strengthening the institutional mechanism for financial stability

1.42 Post crisis, the Union Budget 2010 has announced the establishment of a high-level Financial Stability and Development Council (FSDC) with a view to strengthen and institutionalise the mechanism for maintaining financial stability. The FSDC is taking shape and the Reserve Bank's role in it would expectedly be critical. The Union Budget also proposed the setting up of a separate Financial Sector Legislative Reforms Commission to rewrite and clean up the financial sector laws to bring them in line with the requirements of the sector. Any revision to legislations

in the banking and financial sector will, however, need to be driven by clear policy direction for the sector.

Financial Market Infrastructure

Financial Market Infrastructure remained robust

1.43 Payment and settlement systems in the country functioned without disruptions. The degree of concentration of payment activities in a few participants requires careful monitoring. Some critical payment and settlement systems remain outside the purview of the Payment and Settlement System Act, 2007.

Systemic risk bearing capacity of CCPs has become critical

1.44 Settlement through Central counterparties (CCPs) has been the preferred mode of settlement for large value interbank transactions in India, wherever feasible. The Clearing Corporation of India (CCIL) acts as a CCP in a wide range of markets, products and participants and the spillover effects of defaults/ disturbances in any one market/product are likely to be commensurately greater. From a stability perspective, a multi-product CCP such as CCIL essentially becomes, and will need to be treated as, an entity which is systemically important.

OTC derivative markets in India have developed within a regulated space; a few issues need to be addressed

1.45 Setting up of a resilient OTC derivatives market infrastructure has been a widely shared key priority for policy makers internationally. In India, the OTC derivatives markets developed within a regulated framework. But some concerns remain. The participation structure in many derivative markets remains skewed with volumes concentrated in a few participants. Volumes in some derivatives markets remain relatively low making it challenging to mandate guaranteed clearing for such products. A further area for regulatory initiative in the Indian markets would be greater standardisation of OTC products and introduction of central clearing arrangements for a greater number of such products. However, given the vanilla nature of products permitted in the country, standardisation of existing products may not be very difficult.

Deposit insurance system in India– robust but some issues remain

1.46 Several issues and key challenges continue to be faced by the deposit insurance system in India. Ensuring the adequacy of the deposit insurance fund remains critical for ensuring the efficiency of the system. The Reserve Ratio for Deposit Insurance and Credit Guarantee Corporation (DICGC) at end-March 2010 was relatively low at 0.85 per cent, though there is no clear international benchmark in this regard. The coverage ratio of deposit insurance in the country remains one of the lowest in terms of per capita income. The need for increasing the cover requires to be examined carefully.

1.47 A robust delivery system to reduce the time taken by DICGC to effect payments on claims well within the stipulated time presents a huge challenge given the geographic spread of the country and the unsatisfactory quality of data in respect of particulars of depositors. The process necessitates improvements to systems of record keeping - the Corporation has already initiated early steps in this direction; and accountability of liquidators to ensure timely flow of information to the Corporation.

Stress testing

Stress Tests reflect muted macro-financial risks in the short run

1.48 Stress testing on the credit, market and liquidity risks faced by banks in India indicates a reasonable degree of resilience of the banking sector. Some deterioration in the capital position of banks is evidenced only in case of a very sharp increase from the current NPA levels. Interest rate risks displayed an increasing trend while some banks continued to face liquidity constraints under stringent stress scenarios. Both aspects warrant monitoring.

1.49 The banking sector also displays resilience in response to stressed domestic macroeconomic variables though the impact of strong headwinds arising from any sharp deterioration in the global economic situation needs to be monitored.

Chapter II
Macroeconomic Environment

The global economy is recovering from the crisis but some existing concerns remain and new concerns have emerged. Several advanced and other economies suffer from slow growth and high sovereign debt. Some measures taken by advanced economies like large interest rate cuts, maintenance of near-zero rates and injections of liquidity are leading to large capital inflows to emerging market economies (EMEs) and to higher commodity prices. The full recovery of trade as well as confidence at the global level is contingent upon recovery of all economies, particularly the advanced economies.

Business cycle synchronisation of the Indian economy with most of the advanced economies and EMEs has increased over time. Thus, deterioration of global risks, uneven recovery in growth and employment, elevated commodity, particularly food prices, and global imbalances have a stronger impact on India than before. On the domestic front, a large share of volatile components in financing of current account deficit (CAD), limited fiscal manoeuvrability and a sharp rise in asset prices too have implications for financial stability. The performance of retail credit has improved but the rise in asset prices, particularly that of housing, is emerging as a concern.

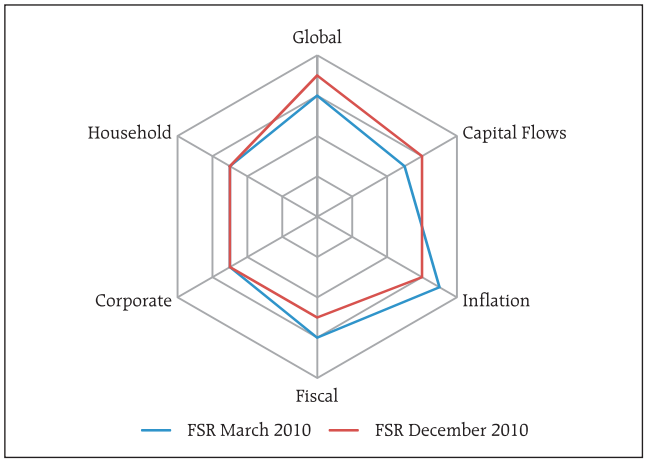
Role of Macroeconomic Risks

2.1 Macroeconomic risks affect financial stability through multifarious channels. The outlook for growth and employment at the global and domestic levels impact the ability of debtors to pay back borrowed funds and perceptions of credit risk. Inflation/deflation risks determine real debt burdens and impact fixed income markets. Fluctuations in asset prices impact the value of collaterals and the ability of debtors to meet their obligations. Macroeconomic imbalances or shocks and unsustainable fiscal and external debt burdens provide fertile ground for triggering disruption of the financial system. The process of economic rebalancing too has implications for the financial system. During internal rebalancing, fiscal consolidation needs to be accompanied by enhancement of private demand through larger and cheaper flow of credit. On the other hand, during external rebalancing, many advanced countries may have to increase their reliance on net exports while several EMEs have to enhance their dependence on domestic demand. This entails, among others, some readjustment of the exchange rates and reorientation of the financial system.

Overall Macroeconomic Risk Scenario in India – Comparative Position

2.2 As compared to our previous assessment in the first Financial Stability Report (FSR) published in March 2010, there has been deterioration in global and capital flows risks. Both household and corporate sectors continue to remain healthy and their risk levels remain unchanged. Inflation risks have abated, although they still remain high. Fiscal conditions too, though stretched, have improved with initiation of consolidation measures (Chart 2.1)

Chart 2.1: Overall Macroeconomic Risks



Note: Distance from the centre measures the level of risk
Source: Staff Estimates

Global Developments

Global Risks Worsen

2.3 Business cycle synchronisation (in terms of GDP) of the Indian economy with most of the advanced and EMEs has increased over time, particularly during recent periods,[1] thereby enhancing the influence of global developments. The Global Financial Stability Report (IMF, October 2010) highlights increases in risks to financial stability as compared to its assessment in April 2010. Aggravation of sovereign debt and deflation concerns contributed to increase in macroeconomic risks. Risks associated with banking sector also went up during this period. However, due to stronger corporate sector, the overall credit risks remained unchanged. Risks associated with emerging markets recorded some improvement due to strong fundamentals and better growth outlook.

Global Growth is uneven and uncertain ...

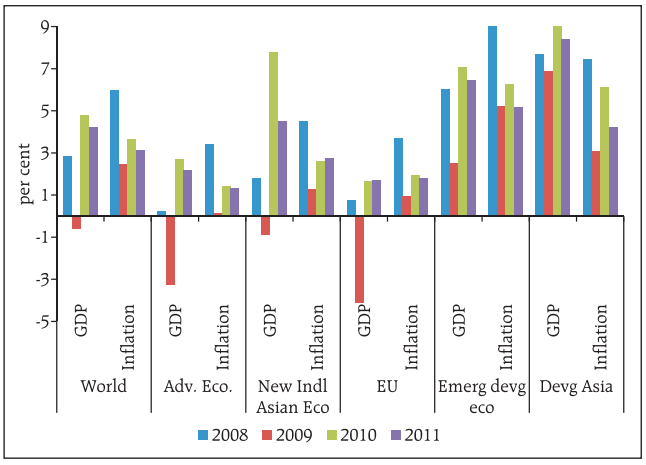
2.4 The IMF has projected that the current calendar year may witness a global recovery followed by modest deceleration in the following year (Chart 2.2). Data on Purchase Managers Indices (PMIs) for manufacturing in the U.S. and Eurozone though above 50, are currently lower than the peak of 60 reached in April 2010, thereby indicating possible prolongation of slow growth (Chart 2.3).

2.5 Rebalancing in favour of domestic economies by some countries may inhibit full recovery of world trade. In the U.S., a major trading partner of India, while there is a positive push with the liquidation of inventories, persistence of high unemployment, low growth in consumer spending and dormant housing sector point towards prolonged recovery. Further, the current deleveraging is expected to be a protracted process. And as Japan has experienced, these are difficult conditions to offset with monetary and fiscal policies.

... Unemployment remains high among advanced economies

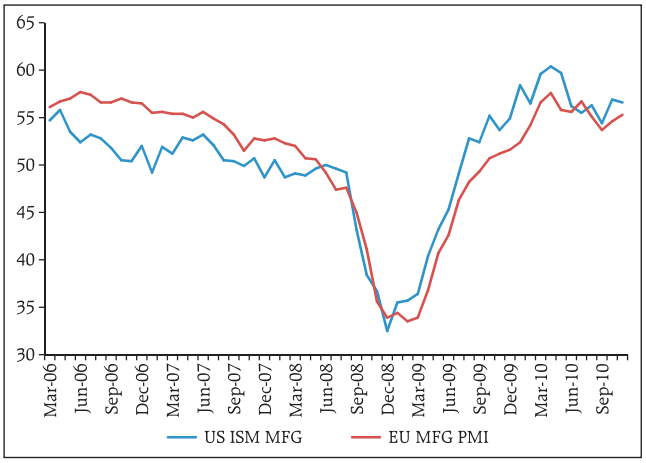
2.6 High unemployment among advanced economies is a concern as it is expected to a have a more persistent impact on global demand (Chart 2.4). Structural employment may take longer to reach its pre-

Chart 2.2: Global Growth and Inflation



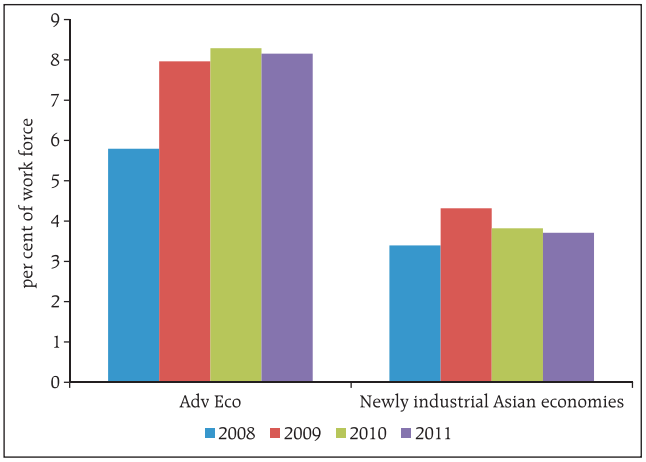
Note: Data for the years 2010 and 2011 are forecasts
Source: WEO, October 2010, IMF

Chart 2.3: PMI in the U.S. and Eurozone



Source: Bloomberg

Chart 2.4: Unemployment



Note: Data for the years 2010 and 2011 are forecasts
Source: WEO, October 2010

[1] RBI (2010). Global Financial Crisis and the Indian Economy. *Report on Currency and Finance.*

crisis levels and may drag down productivity over the medium-term.

Sovereign debt high and resolution to be prolonged

2.7 The sovereign debt crisis has made the link between debt management and financial stability more explicit suggesting the need for closer coordination with fiscal, monetary and financial stability authorities. It is well recognised that government debt cannot grow on a sustained basis well above the growth rate of nominal GDP without causing severe disruptions to the overall economic system. The large share of fiscal resources needed to service higher public debt might crowd out productive expenditures and could also lead to higher distortionary taxation. In the long run, persistently high debt makes economies more vulnerable to adverse shocks, reduces their long-run growth potential and impacts monetary and financial stability. High levels of public debt also tend to undermine the credibility of monetary policy. The sovereign debt crisis and its management provides useful experiences and lessons (Box 2.1).

Box 2.1: Sovereign Debt Crisis

The macroeconomic imbalances and structural weaknesses of the Greek economy surfaced under the pressure of the economic and financial crisis characterised by large fiscal deficit, enormous public debt and consistently eroding competitive position manifested in a gradually deteriorating current account balance. Large holdings of sovereign debt paper with European banks sparked off systemic concerns. Similar concerns in other EU economies namely Portugal, Ireland, Italy and Spain added to these concerns. Heavy selling of the sovereign debt of vulnerable euro area economies took a toll on their banking system. This caused a significant depreciation of the euro and a broader decline in stock prices in the Euro zone but also transmitted volatility to other financial markets across the world. Risk premiums on corporate bonds widened, and corporate bond issuances slowed to a trickle in May. Issuance in emerging markets also dropped sharply.

To assist Greece, on May 2, 2010, Euro Area and IMF pledged US$145 billion in bilateral loans and Stand-by arrangement. Subsequently, the Economic and Financial (Eco-Fin) Council of the European Union (EU) announced stabilisation measures on May 10, 2010. These measures included creation of a European Stabilisation Mechanism (ESM) which incorporates strong conditionality and has two components: (i) the first permits the European Commission to provide up to €60 billion (US $ 79 billion) balance of payments facility for Euro zone members that are facing a severe deterioration in borrowing conditions due to factors beyond their control. This will carry IMF conditionality and will be financed by the issuance of EU bonds; and (ii) the second is a voluntary intergovernmental agreement of Member States to compliment the Commission resources through a Special Purpose Vehicle (SPV) called European Financial Stability Fund (EFSF) and worth up to €440 billion (US$ 580 billion) over a period of three years. The IMF decided to participate in the financing arrangements and would provide at least half of the funding requirements. This would be guaranteed proportionately by participating Euro zone members, and also subject to strong conditionality.

In parallel with the announcement of the ESM, the European Central Bank took action to stabilise euro area sovereign debt markets through sterilised purchases of sovereign debt of certain countries. The ECB announced security markets programme with interventions in both public and private debt securities markets. The G7 also announced the reactivation of bilateral dollar swap lines between the Federal Reserve and ECB, Bank of England and SNB. Temporary swap facilities with the US Federal Reserve were reactivated using ECB-eligible collateral. European policy initiatives and frontloading of fiscal adjustment, led to reduction in tail risks and improvement in financial conditions. However, underlying sovereign and banking vulnerabilities remain a significant challenge amid lingering concerns about risks to the global recovery.

Even as the Greek crisis was going into the backburner, the Irish debt situation has surfaced. Recently the Irish government declared that its recapitalisation commitment to its banking system was going to be higher than previously estimated (from €33 billion to €46 billion i.e. from 20 per cent to 28 per cent of GDP). This immediately raised concerns for the sustainability of Ireland's sovereign debt. The Irish government has stated that its funding needs until mid-2011 are met and initially resisted accepting bailout funds. The Credit Default Swaps on its sovereign debt have risen manifold while the market for its debt is virtually shut.

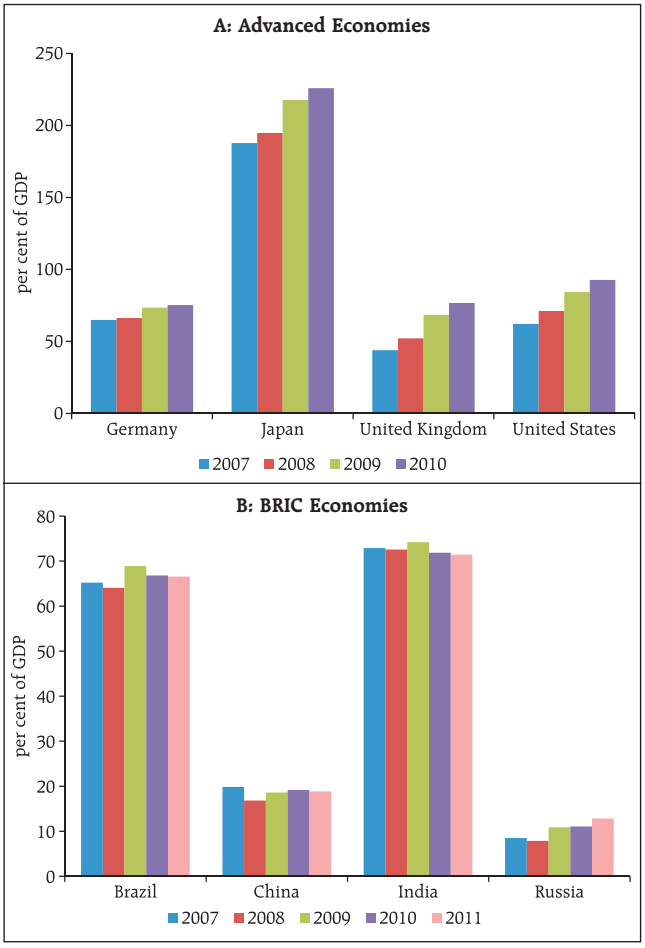
Prior to the crisis, the Irish fiscal situation was very sound. Low corporate taxes, and interest rates (owing to introduction of Euro) have fuelled a bank finance led housing and commercial real estate boom. Taxes associated with asset booms like estate and capital gains tax became a large component and eventually evaporated when the cycle turned during the crisis.

In monetary unions like the euro system member countries pursue independent fiscal policies but do not have recourse to exchange rate or monetary policy levers to make the adjustment needed. This underscores the importance of sound and credible fiscal policies by member countries to ensure the independence and credibility of their collective monetary policy, in the absence of which, monetary policy could become hostage to fiscal excesses of individual members. Developments in the Euro area following the sovereign debt crisis in Greece also underscore the need for and significance of timely fiscal exit, with an emphasis on the quality of adjustment, for ensuring sustainable robust growth in the medium-run.

2.8 Rise in fiscal deficit during and after the crisis is reflected in the increase in public debt in major economies (Charts 2.5A and 2.5B). Aggregate public debt of the advanced economies is projected to rise from 76 per cent of GDP in 2007 to more than 100 per cent in 2011[2]. It has been observed in the previous crises that the real stock of debt nearly doubles three years after the crisis which implies that we may see further deterioration in public debt ratios. Moreover, "the average length of time a country spends in a state of sovereign default is far greater than the average amount of time spent in financial crisis."[3]

2.9 Debt consolidations also pose severe challenges. An analysis of 100 episodes of banking crises during 1980–2008[4] has revealed that: (a) debt consolidation is less successful when countries are hit by longer-lasting banking crises; (b) debt consolidations are more likely to be successful when they are based on cuts in current expenditures; (c) raising tax revenues is important for debt reduction in countries with large consolidation needs; and (d) fiscal adjustment can be complex in the aftermath of banking crises, requiring supporting actions to revive growth through implementation of structural reforms to enhance productivity as well as measures to reduce economic distortions in the economy.

Chart 2.5 General Government Gross Debt -



Note: Data for the years 2010 and 2011 are forecasts
Source: WEO, IMF, October 2010

Twin Deficits complicate the position further

2.10 In addition to fiscal deficits, current account imbalances continue to persist, particularly in advanced economies, though they are expected to moderate in 2011. While excessive fiscal and external imbalances are undesirable individually, the simultaneous occurrence of both deficits poses a more serious concern.[5]

2.11 Some of the major advanced economies have been recording twin deficits before and after the crisis

[2] BIS (2010). *80th Annual Report.*

[3] Reinhart, Carmen M. and Kenneth S. Rogoff (2010), "This Time is Different - Eight Centuries of Financial Folly", *Princeton University Press*, Princeton and Oxford

[4] Baldacci, Emanuele, Sanjeev Gupta and Carlos Mulas-Granados (2010). "Restoring Debt Sustainability After Crises: Implications for the Fiscal Mix". *IMF Working Paper* WP/10/232, October

[5] Based on the identity "*Domestic Private Sector Financial Balance + Governmental Fiscal Balance - the Current Account Balance (or Trade Deficit/Surplus) = 0"* domestic private sector and the government sector cannot both deleverage at the same time unless a trade surplus can be achieved and sustained.

(Chart 2.6). Resolution of twin deficits through inward or domestic orientation by the afflicted economies would inhibit the recovery of world trade. Since the U.S. and Europe account for a major share of exports from India, the recovery in Indian exports is expected to be slow in such a scenario.

Economic Rebalancing too slow

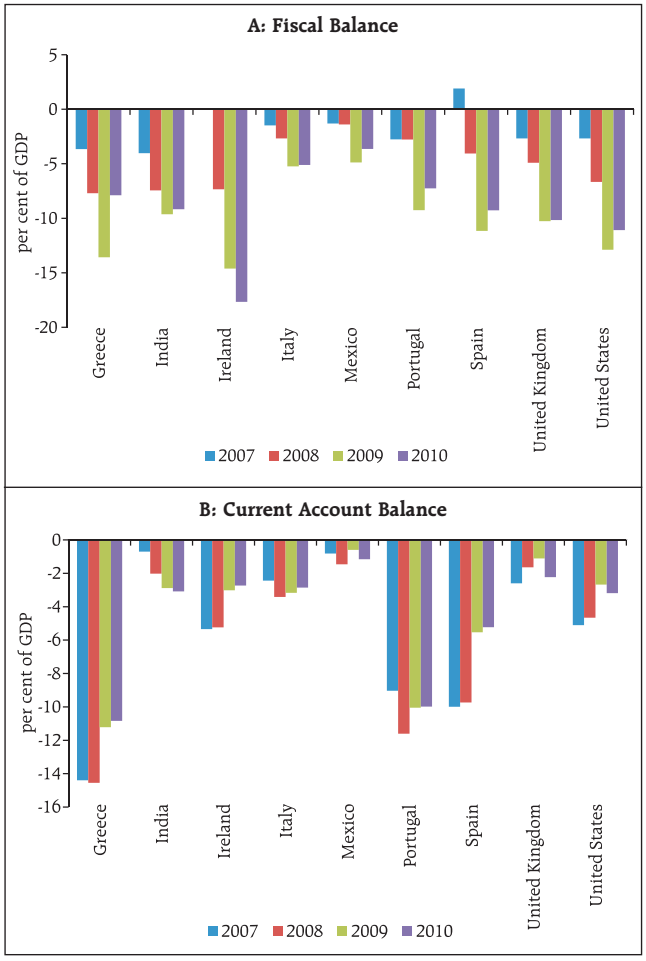
2.12 To prevent reemergence of global imbalances with recovery, both internal and external imbalances need to be corrected by several countries. These two rebalancing acts are taking place too slowly. IMF (WEO, October 2010) has expressed the view that rebalancing from public to private demand in advanced economies and rebalancing from external to domestic demand in key emerging economies are closely related and a robust recovery requires that they move ahead together.

2.13 There are costs associated with different solutions to corrections of fiscal and current account imbalances. WEO has estimated that a fiscal consolidation equal to 1 per cent of GDP typically reduces GDP by about 0.5 per cent within two years and raises the unemployment rate by about 0.3 percentage point. Domestic demand—consumption and investment—falls by about 1 per cent. Further, postponing fiscal consolidation in advanced economies until emerging economies have boosted internal demand increases downside risks in the form of an unfavorable market reaction which raises advanced economies' sovereign and corporate spreads. This, in turn, forces these economies into large, frontloaded, and ill-targeted fiscal consolidation that takes many years to become credible and to bring spreads down.

2.14 Use of very large exchange rate changes which are effected in a short period for correction of current account imbalances can undermine growth and can have adverse socio-economic and political consequences. But moderate real exchange rate adjustments are generally useful to keep current account imbalances within reasonable bounds and are especially important in present circumstances to assure a balanced global recovery.

2.15 For faster and robust recovery, policymakers need to agree to a common path on managing currencies and demand imbalances.

Chart 2.6: Major Twin Deficit Economies



Source: WEO, IMF

Global trade revival need to strengthen further

2.16 In addition to its direct contribution as reflected in national accounts, trade also contributes through knowledge spillovers, externalities and learning. The global crisis has not reduced the stock of global knowledge.

2.17 During 2009 world trade volume contracted by 11.0 per cent (WEO, October 2010). The contraction in exports of advanced economies (-12.7 per cent) was greater than that of emerging and developing economies (-8.2 per cent). During the current year, the loss of the previous year is expected to be almost fully recouped. However, the persistence of Baltic Dry Index at lower levels indicates continuance of sluggishness in the recovery of world trade (Chart 2.7).

Chart 2.7: Baltic Dry Index

Source: Bloomberg

Domestic Developments

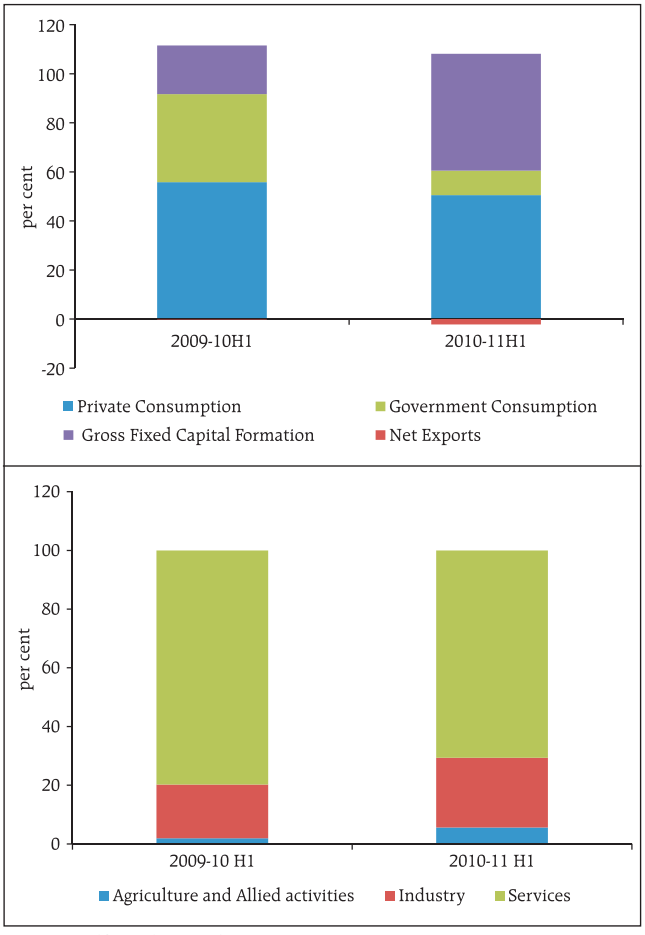
Growth in GDP- Contribution of Demand and Supply Side

2.18 The global financial crisis had depressed demand conditions in 2008-09. Private final consumption and fixed investment witnessed a drag. As a result, large fiscal stimulus measures were undertaken to augment domestic demand in the economy. Despite fiscal stimulus, weak demand conditions persisted till the first half of 2009-10. Growth rebounded during the second half of 2009-10 led by strong growth in fixed investment and recovery in private demand. In the first half of 2010-11, fixed investment and private consumption continued to remain the key contributors to overall growth (Chart 2.8).

2.19 From supply side, the industry and services have emerged as the prime drivers of growth. The industrial sector, which got most impacted by the crisis through the trade channel, has recorded significant recovery.

2.20 The outlook of growth in GDP has substantially improved (Charts 2.9 – 2.10). The PMIs for both manufacturing and services, which were in contractionary mode till March 2009, have been in expansionary mode since then and strengthening over time. Business confidence has also been on the

Chart 2.8 : Contribution to Growth of GDP



H1: First Half (April-September)
Source: CSO

upswing. Select leading indicators of the services sector also indicate resurgence in the sector (Table 2.1).

Table 2.1: Services Sector Indicators

(Per cent)

	2007-08	2008-09	2009-10	2010-11
Commercial vehicles production	4.8	-24.0	35.9	53.6
Power Generation [Surplus/Deficit (-)]	-9.9	-11.1	-10.1	-11.1

2.21 It may be noted that unlike the growth path traversed by present day advanced economies, India has experienced a service dominated growth. The share of manufacturing sector has remained modest (Chart 2.11). Stability and sustenance of higher levels of growth will hinge on greater contribution from the manufacturing sector. The growth in infrastructure sector, in particular, needs to be further enhanced for stable growth.

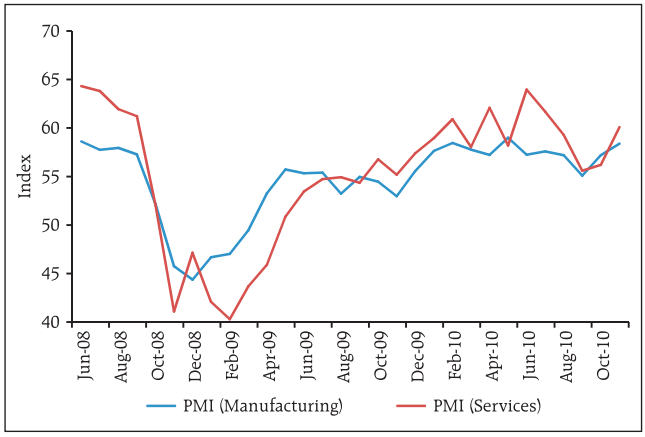
2.22 While industrial production has seen a steady recovery since the second quarter of 2009-10 as compared to low growth in 2008-09 in the aftermath of the Lehman collapse, the volatility in growth rates in the past few months complicates an accurate assessment of underlying macroeconomic conditions (Chart 2.12).

Persistence of Inflation

2.23 While the risks to growth have receded, inflation risks have come to the fore. Inflationary pressures persist both from higher global commodity prices and domestic demand. Global prices of major commodities, including crude oil, gold, iron ore, silver and farm goods like cotton have risen sharply. This can largely be attributed to excess liquidity maintained by central banks. The FAO Food Price Index has also risen close to its pre-crisis peak. Upswing in food prices, particularly of sugar, cereals and edible oil at the global level (Chart 2.13) is of concern to India as it limits the use of food imports as a tool for curbing domestic food inflation which continues to rule at elevated levels.

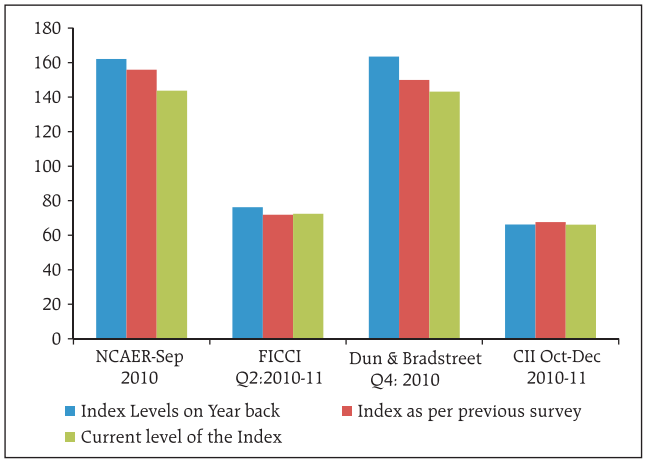
2.24 Structural demand-supply mismatches in several commodities have contributed to high domestic food price inflation (Chart 2.14). In particular, prices of protein-rich foods like eggs, milk, pulses, meat and fish as well as fruits and wheat in India has been ruling at

Chart 2.9: Rise in Purchasing Managers Index (PMI)



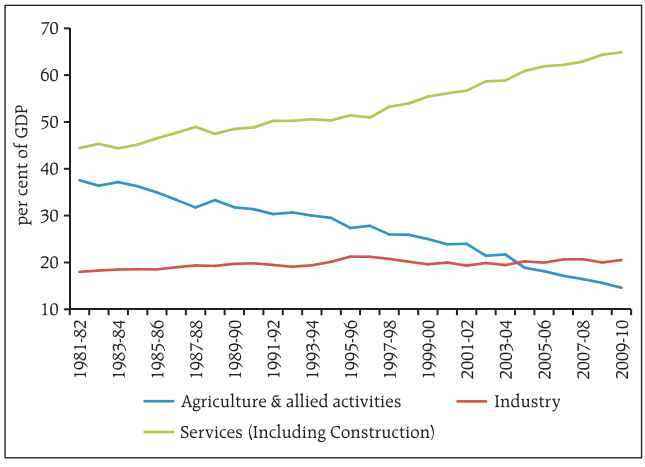
Source: HSBC Markit

Chart 2.10: Business Expectations Surveys



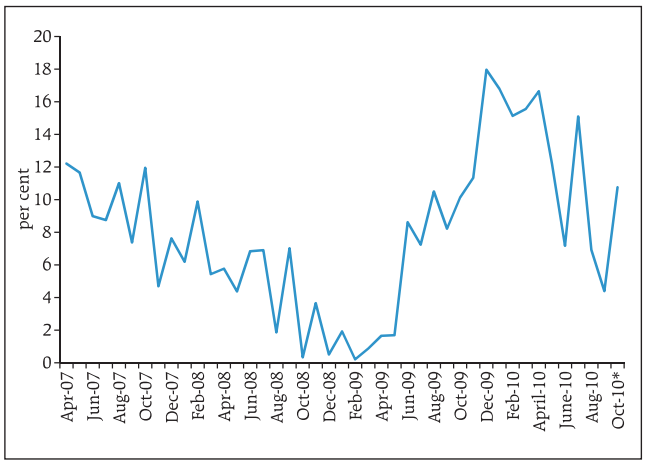
Source: Respective Agencies

Chart 2.11: Structural Transformation of GDP



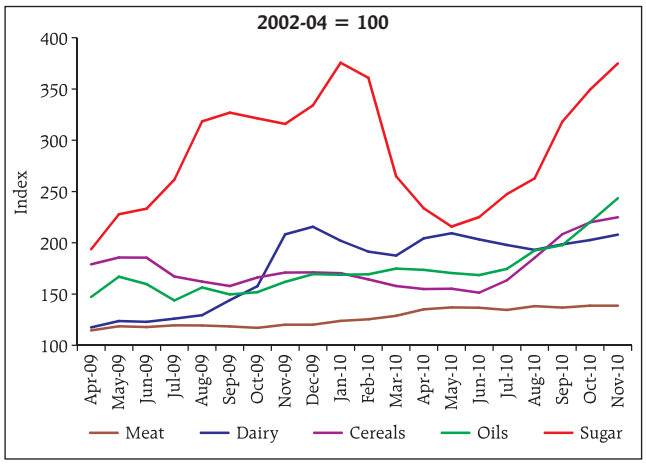
Source: CSO

Chart 2.12: Change in Index of Industrial Production



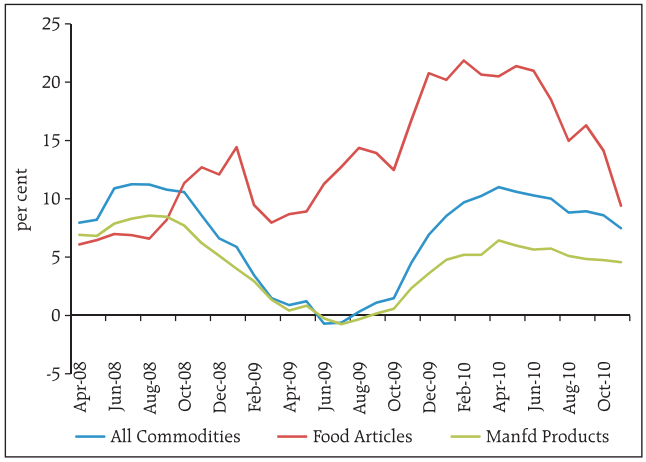
Source: CSO

Chart 2.13: Elevated Global Food Prices



Source: FAO

Chart 2.14: Elevated Domestic Food Prices



Source: Government of India

high levels. The causative factors include rising income, changing consumption pattern, stagnant agricultural productivity and rising global prices.

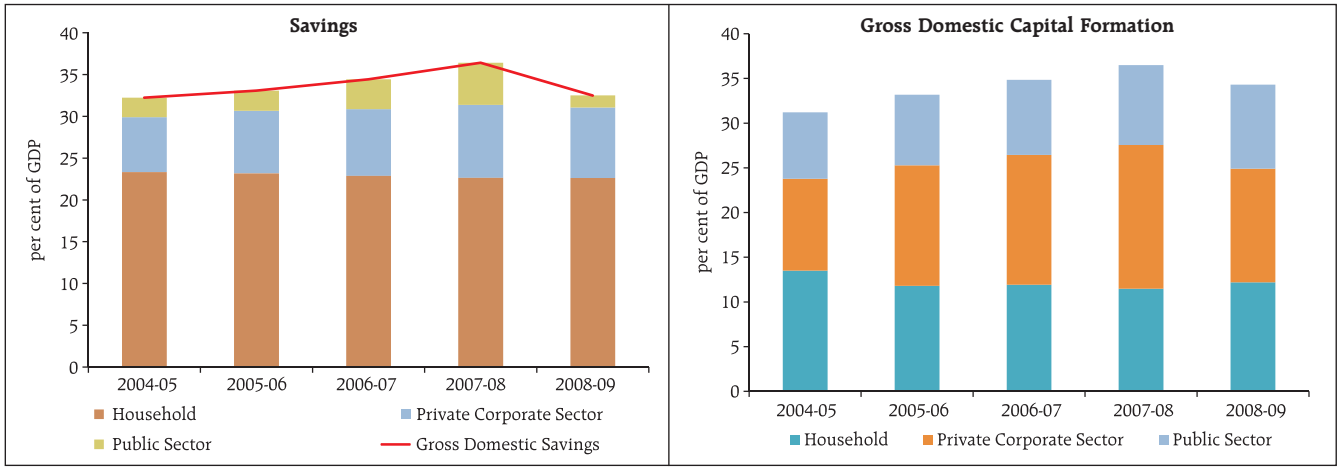
2.25 The monetary policy response has been calibrated based on domestic growth-inflation scenario and global developments. Since October 2009, the Reserve Bank has cumulatively raised the cash reserve ratio (CRR) by 100 basis points, and the repo and reverse repo rates under Liquidity Adjustment Facility (LAF) by 150 and 200 basis points, respectively. Recently, statutory requirement of investment in SLR securities has been reduced by one percentage point and open market purchase of government securities worth ₹48,000 crore has been announced to ameliorate the shortage of liquidity. The increased frequency of policy reviews should help in managing expectations and reducing uncertainties.

Savings and Investment – the shortfall widens

2.26 The rate of gross domestic savings (GDS) was lower in 2008-09 reflecting the impact of sharp fall in the rates of savings of the public sector and marginal fall in that of private corporate sector. The rate of saving of the household sector remained unchanged at the previous year's level (Chart 2.15).

2.27 The gross domestic investment rate declined consequent to a fall in private corporate investment. However, the fall in investment was less than that of savings and the shortfall was reflected in the widening of current account deficit.

Chart 2.15: Savings and Investment

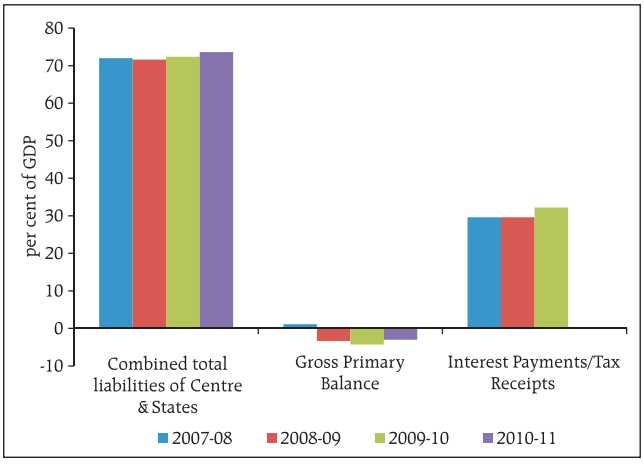


Source: CSO

Fiscal situation still stretched

2.28 Use of countercyclical fiscal measures and the recent sovereign debt crisis underscores the importance of fiscal conditions for financial stability. In India, apart from enabling output stabilisation on a high growth path, fiscal measures have been used for limiting the impact of temporary but large supply shocks on headline inflation. The extraordinary fiscal policy measures undertaken in India during 2008-09 and 2009-10, to a large extent, achieved the short-term objective of containing the economic slowdown and stimulating the economy thereafter. The public debt, as a result, rose in 2009-10 and is expected to cross 73 per cent of GDP in the current year (Chart 2.16).

Chart 2.16: Combined Debt of Centre and States and Primary Balance



Source: RBI

2.29 Though India has a relatively high level of deficit and debt among emerging market countries, the sovereign has not committed the 'original sin'[6] of high borrowing in foreign currency. Most of the country's public debt is denominated in domestic currency and held domestically. The Government does not borrow in external commercial markets. However, investment by FIIs has been allowed subject to macroprudential caps on such investment.

2.30 The maturity profile of debt[7] also compares favourably with other countries. The average maturity

[6] Inability to borrow abroad in terms of domestic currency and to borrow domestically long-term is referred to as "Original Sin" in Eichengreen, Barry and Ricardo Hausmann (1999), "Exchange Rates and Financial Fragility," in *New Challenges for Monetary Policy,* Kansas City: Federal Reserve Bank of Kansas City, pp.329-368

[7] Choice of maturity of issuance of debt can affect monetary conditions and funding markets for banks and others as securities in a market economy are normally priced off the sovereign yield curve. Issuance of short term government debt can reduce the government's short-run debt servicing burden but interfere with impact of monetary policy decisions on the yield curve. Shortening maturity of debt issuance also increases the government's refinancing risk. At the same time, increased long term public debt creates a steep yield curve thus creating incentives for banks to extend duration of assets and reduce it for liabilities. It also sharpens the risk/cost trade-off for sovereign debt management.

of outstanding debt and share of debt maturing in the next few years for India is comfortable vis-à-vis some select countries (Charts 2.17 and 2.18). The funding structure also shows no extreme risk (Chart 2.19).

2.31 Nevertheless, the current debt level hovering above 70 per cent for the past three years is much above the historical averages of 55 per cent in the 1980s and 63 per cent in the 1990s. As a result of the high debt, the interest payments have been rising and account for almost one-third of the total tax receipts. Lowering of debt would provide room for fiscal manoeuverability and send a strong signal of the government's commitment to fiscal consolidation.

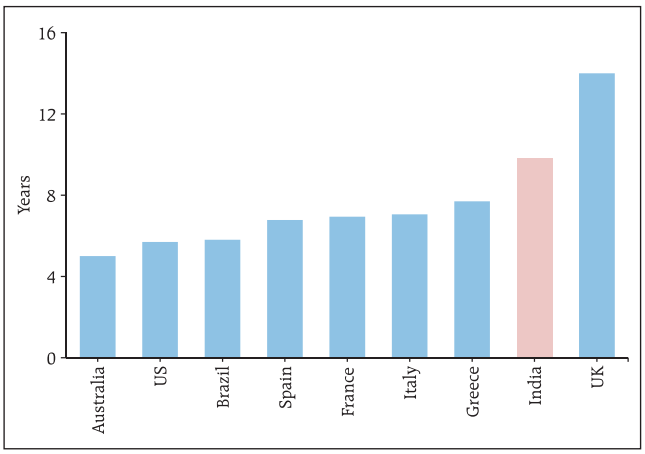
2.32 This year, government revenues have been buttressed by one-time receipts especially telecom receipts and divestment proceeds. Going forward, fiscal consolidation should focus on 'quality of adjustment' underpinned by revenue-led correction and reprioritisation of expenditures with a focus on outcomes.

Widening of Current Account Deficit and Resurgence of Capital Flows

2.33 Notwithstanding some fiscal consolidation, the current account has been widening accompanied by rise in capital flows. Studies on cyclical synchronisation and variance decomposition studies have highlighted the growing importance of financial channels of transmission of global developments in recent periods[8]. Moreover, the probability of a banking crisis conditional on a capital flow bonanza has been found to be higher than the unconditional probability[9]. Thus, the rise in capital flows needs to be closely monitored.

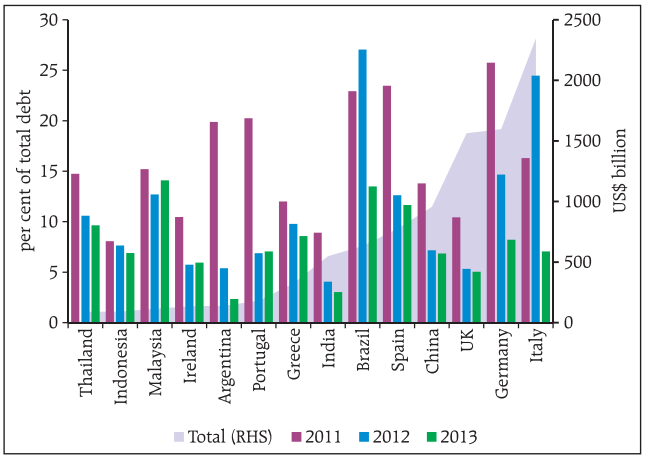
2.34 The absorptive capacity of capital flows as reflected in the magnitude of the CAD has increased in the recent years from 2.4 per cent of GDP in 2008-09 to 2.9 per cent of GDP in 2009-10, which reflected the recovery in growth (Chart 2.20). The uncertain and uneven global recovery, particularly in advanced economies, could have an adverse impact on exports

Chart 2.17: Average Maturity of Sovereign Debt in some Select Countries



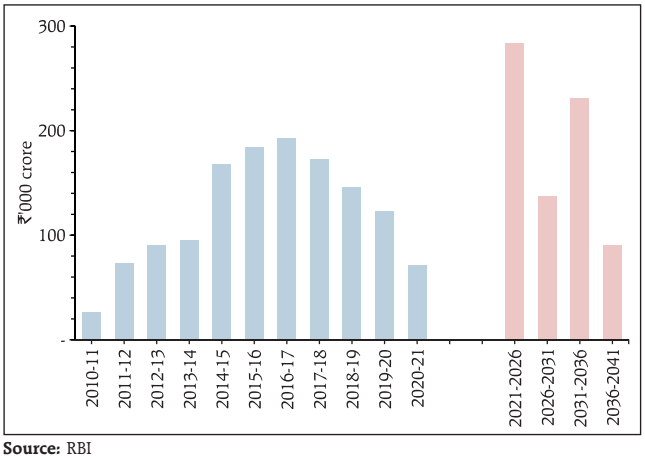
Source : Various Treasuries

Chart 2.18: Sovereign Debt maturing in next three years



Source : Bloomberg

Chart 2.19: Maturity Profile of Central Government Dated Securities



Source: RBI

[8] RBI (2010). *op. cit.*

[9] Reinhart and Rogoff (2010), *op. cit.*

from India. Hence, during 2010-11, the CAD/GDP ratio could rise further. While capital flows to the country are expected to be robust, an increase in the share of lumpy and volatile capital flows in funding widening deficit raises the risks of the destabilising impact of sudden stops or reversal of capital flows. Excess capital flows also pose challenges for exchange rate, interest rate and inflation environment. These are discussed in Chapter III of the Report.

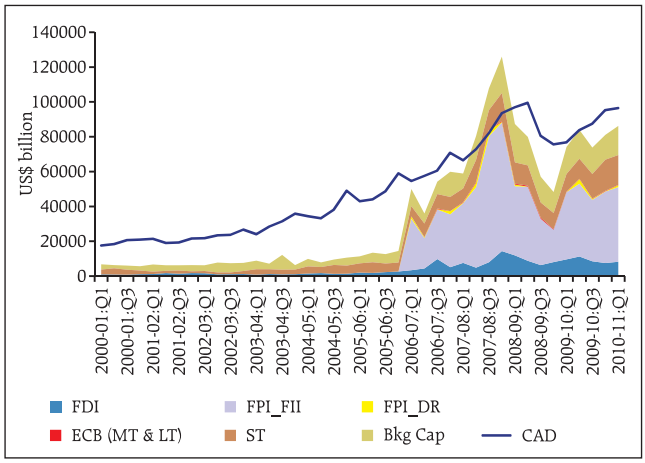
International Investment Position

2.35 Along with widening of CAD, there has been rapid growth in international liabilities after March 2009 resulting in increase in net claim of non-residents on India (international assets-international liabilities) or the net international investment position and in June 2010, which stood at US$ 185.1 billion, more than three times its level in June 2008 (US$ 58.6 billion) and more than two times its level in June 2009 (US$ 86.3 billion). Increase in FDI, portfolio investment and loans have contributed to the growth in international liabilities (Chart 2.21). The enhanced exposure to external liabilities is reflected in the sharp increase in the ratio of external debt to foreign exchange reserves from 89.1 per cent of GDP in 2008-09 to 99.1 per cent as at end June 2010. Moreover, the ratio of short-term debt to reserves has increased from 17.2 per cent to 21.0 per cent during the same period (Chart 2.22). The above trends point to emerging concerns with respect to India's external liability position warranting close monitoring.

Real Estate: Some Concerns Emerge

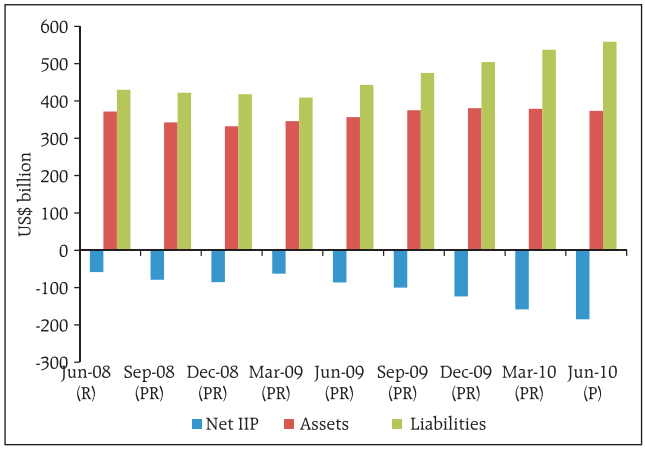
2.36 Housing price has emerged as one of the most reliable indicators of banking crises[10]. Commenting on the outlook of the real estate, the recent WEO (October 2010) observes that in economies where real estate markets are still in decline, the drag on real activity will continue. And in economies where house prices and residential investment are rebounding, concern about bubbles is eliciting policy actions that will temper any short term boost to economic activity emanating from this sector.

Chart 2.20: Components of Capital Flows



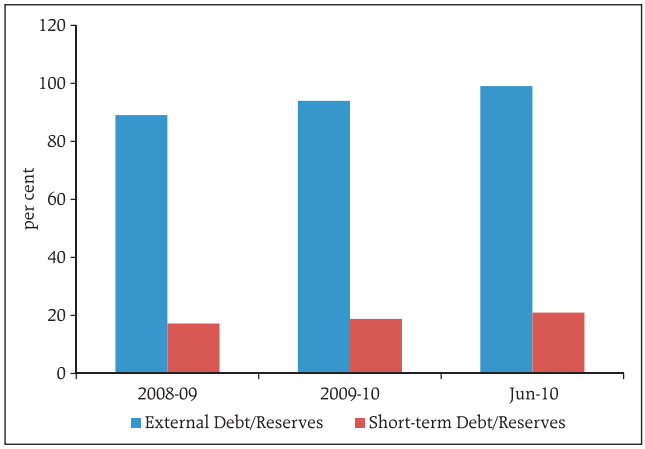
FDI: Foreign Direct Investment FPI_FII: Foreign Portfolio Investment by FIIS
Bkg. Cap: Banking Capital ECB (MT & LT): Long and Medium Term ECBs
FPI_DR: Foreign Portfolio Investment through Depository Receipts
ST: Short-term Credit
Source: RBI

Chart 2.21: International Investment Position



R: Revised PR: Partially Revised P: Provisional
Net IIP: Net International Investment Position
Source: RBI

Chart 2.22: External Liabilities on the Rise



Source: RBI

[10] Reinhart and Rogoff (2010), op. cit

2.37 In India, data on housing prices reveal that prices in many centres have surpassed their pre-crisis levels. The growth in credit to housing sector remained healthy as the banks continued to offer alluring schemes to prospective housing loan borrowers (Chart 2.23).

Continued rise in NPAs in the real estate

2.38 Though the share of credit flowing to real estate has remained stable, the NPAs in real estate sector recorded a rise, thereby underlining the need for more intensive monitoring (Chart 2.24). Against this backdrop, the Reserve Bank announced a series of measures to tighten prudential norms in the sector, as discussed in Chapter IV of this Report.

Corporate Sector

Corporate Interest Liability remains Moderate

2.39 The low interest rate environment and moderation of growth rate resulting in deceleration in borrowings was reflected in a sharp dip in the burden of interest payments in the corporate sector (Chart 2.25). During the first half of current year the growth in interest payments has been modest. The interest coverage ratio continued to hover around 5.

2.40 Except for a small dip in the aftermath of Lehman crisis, the corporate sector has maintained its profitability which implies that servicing of borrowed funds may not get adversely impacted.

RBI Survey shows improved outlook

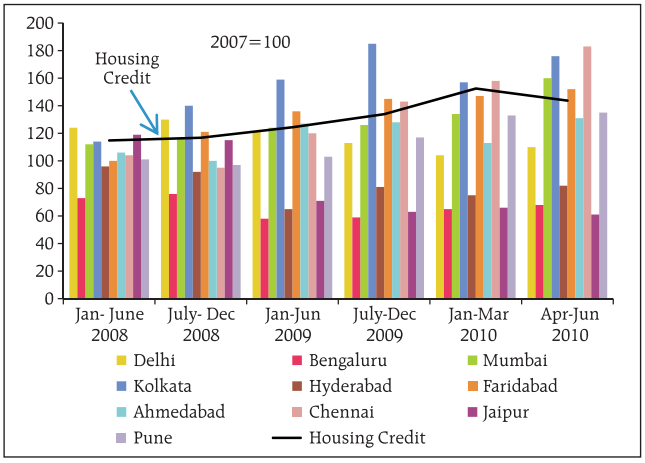
2.41 RBI Industrial Outlook Survey points towards sharp improvement in assessment of the July-September 2010 quarter and expectation of October-December 2010 (Chart 2.26). Both demand and employment conditions have recorded an uptrend.

Household Sector

Borrowing remains at low level

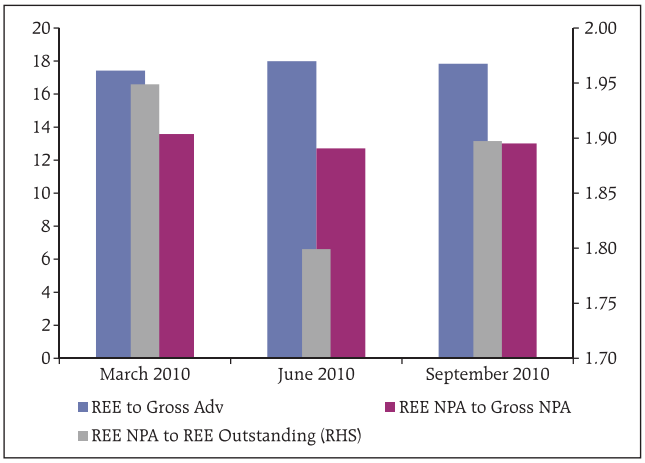
2.42 As mentioned in the first FSR, the dependence of households on bank credit has been ruling at low levels. This trend continues during the first half of 2010-11 (Chart 2.27).

Chart 2.23: Housing Prices and Credit



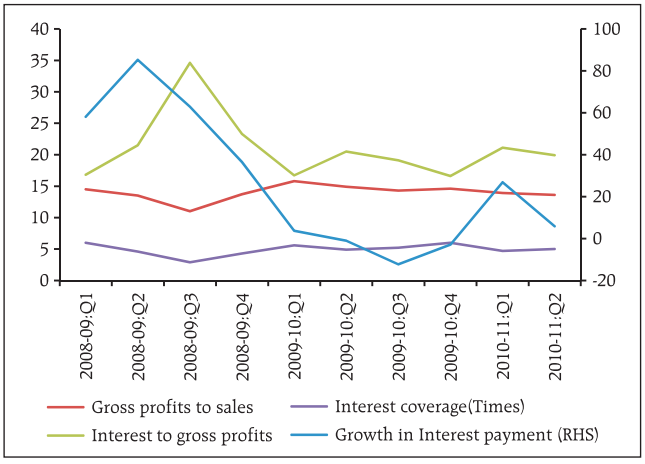
Source: NHB, RBI

Chart 2.24: Quality of Banks Assets in Real Estate Sector



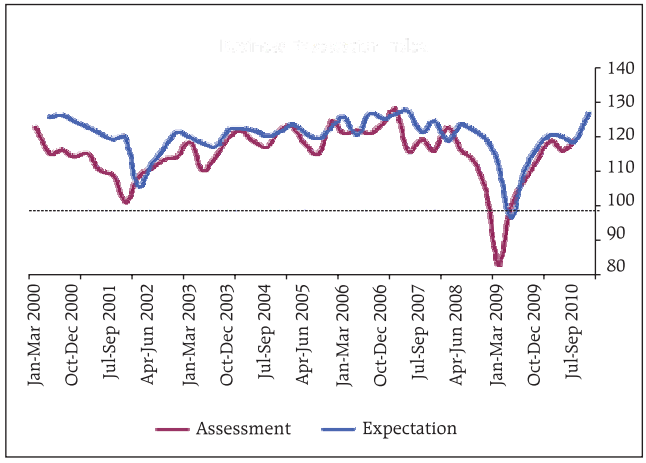
Note: REE-Real Estate Exposure
Source: RBI

Chart 2.25: Interest Payments, Profits and Tax



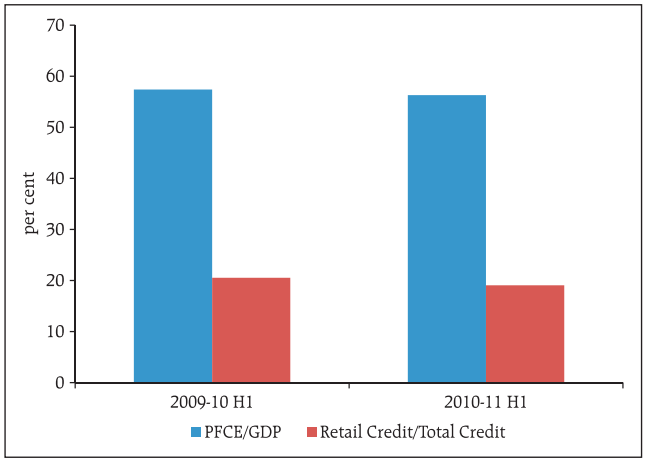
Source: RBI

Chart 2.26: Industrial Outlook Survey



Source: RBI

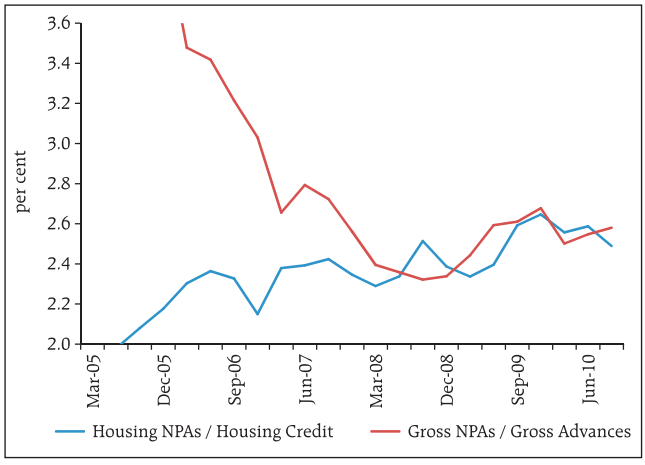
Chart 2.27: Household Consumption and Borrowing



Source: CSO, RBI

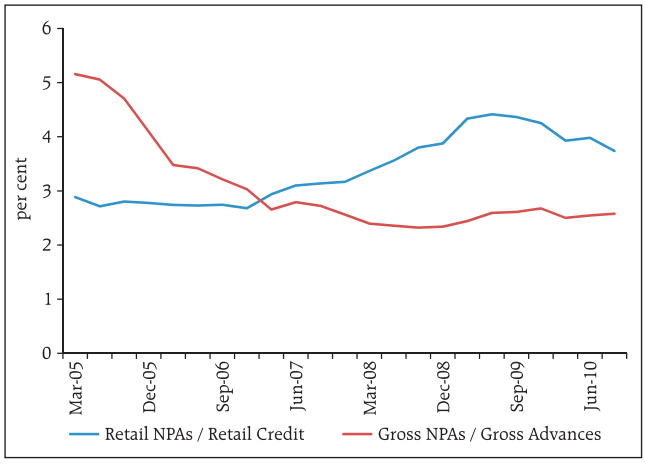
2.43 As mentioned earlier, developments in the housing sector are emerging as a concern due to sharp rise in prices in some centres and in some segments of the housing sector. There was significant increase in the delinquencies in housing loans though gross NPA ratio remained moderate at around 2.5 per cent. As discussed in Chapter IV of this Report this was largely a result of adverse credit selection during the periods of aggressive lending prior to the crisis. (Chart 2.28). Overall, however, there has been some improvement in the quality of the retail loan portfolio of banks which is reflected in lower retail NPAs (Chart 2.29). This points to a possible improvement in the health of households though the level of retail NPAs remains high. The position could be expected to improve with stronger economic growth.

Chart 2.28: Quality of Credit to the Housing Sector



Source: RBI

Chart 2.29: Improvement in Quality of Retail Assets



Source: RBI

Concluding Remarks

2.44 Though the economy is set to move on a higher growth trajectory, certain downside risks at the global and domestic levels remain. First, uncertain and uneven global recovery, particularly in advanced economies, could have an adverse impact on exports from India. Second, the global imbalances continue to persist. There have been some efforts towards rebalancing but the pace of progress is very slow. Third, slow recovery, efforts at rebalancing and competitive currency adjustments are expected to prolong the recovery in world trade. Fourth, the potential surge in capital flows raises the spectre of asset price booms

in some emerging and developing economies. Fifth, high liquidity is driving international crude oil and other commodity prices, which has inflationary implications. Sixth, the rise in current account deficit and the increase in the share of volatile capital flows in financing the deficit require corrective measures. Seventh, the level of public debt needs to be lowered to enhance the fiscal space available to the policymakers and improve the sovereign rating and confidence level. Eighth, rise in housing prices in certain centres and certain practices warrant closer monitoring.

Chapter III
Financial Markets

Prolonged period of financial system fragility, weak economic growth outlook and worsening fiscal strains in advanced economies have together created a climate that is not congenial for financial stability. The current policy support, both implicit and explicit, has not helped in addressing such risks. Funding risks could crystallise with a spill over into India, especially in view of the growing significance of the finance channel. The current two-track recovery in global economy coupled with divergent monetary policy actions has propelled capital flows to EMEs. Risk of asset bubbles in Indian financial markets is a possibility if the current rate of flows is sustained. Moreover, complacency can arise out of strong economic recovery, international investor confidence in the form of FII flows and current level of business and consumer confidence. Hence, the situation warrants watchful monitoring as they embody potential for build-up of risks.

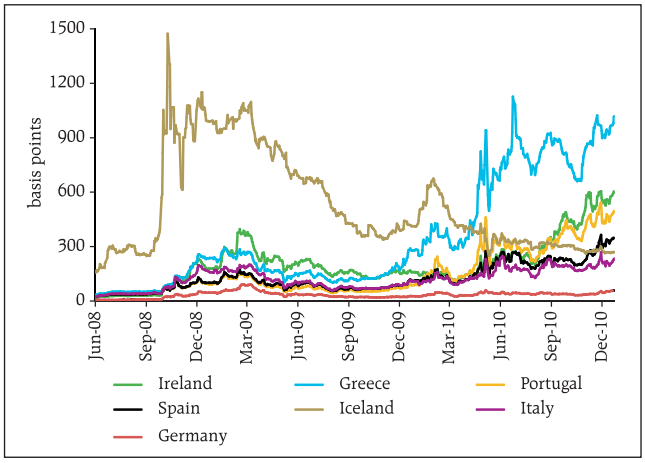
3.1 The most notable development since the previous FSR in March 2010 has been the disturbances in global financial markets caused by concerns over the sustainability of the fiscal position in several European countries. The stress felt in the sovereign bond markets spread quickly to bank funding markets in May 2010 resulting in broader risk aversion among investors. The domestic financial markets were orderly apart from a liquidity constraint due to some structural and seasonal factors.

The global financial markets

3.2 Some strains have redeveloped over concerns about liquidity and solvency of Ireland's large banking system and, as a result, its sovereign debt. The Ireland shock has led to a larger question about the future of the monetary union. In earlier years, before the introduction of the Euro, the adjustment process could have been facilitated in part by exchange rate depreciation that reflected the country's risk.

3.3 In contrast, Iceland which had similar problems to Ireland in the form of an oversized banking sector, but with an independent currency, defaulted on its debt and passed on some of the losses to lenders. Iceland's sovereign CDS, at the time of writing, was trading below Ireland's (Chart 3.1). While Iceland may have avoided a deeper slump, the default might have damaged its long term prospects.

Chart 3.1 : Sovereign CDS Prices

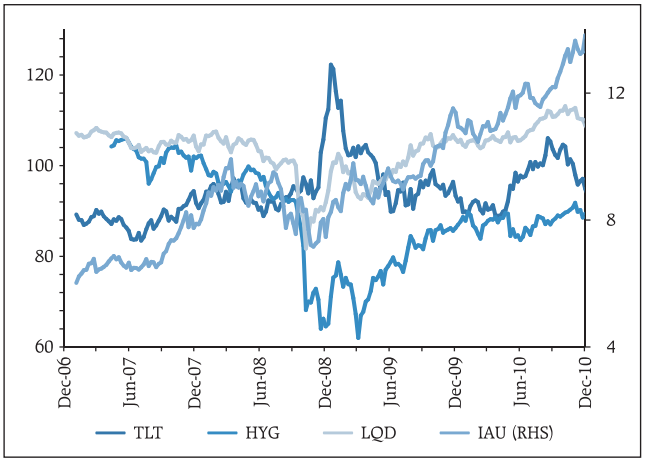


Source : Bloomberg

Accommodative monetary policy persists

3.4 Having reduced policy rates to near zero levels, the Federal Reserve expanded its balance sheet size as the next policy tool. Japan too embarked on Quantitative Easing (QE) by setting up a fund of JPY 5 Trillion (approximately US$ 60 billion) to buy various assets including Japanese treasury securities. In Europe, the ECB has started a Securities Market Program wherein it effectively became a buyer-of-last-resort for the peripheral European sovereign bonds whose markets became dysfunctional and relaxed rating criteria in its collateral policy. Concerns about the health of the banking sector in Europe (particularly in the directly affected countries) and some southern European sovereigns and Ireland remain.

Chart 3.2 : Prices (US$) of ETFs[2] in Various Assets Listed in US[3]



Source : Bloomberg

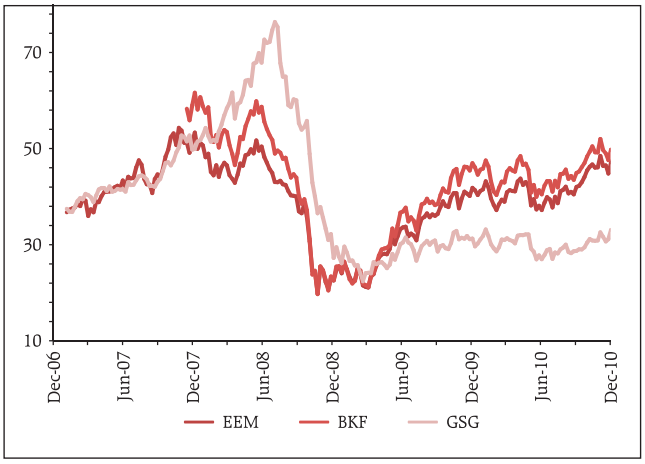
Systemic Leverage on the rise

3.5 Corporate bond issuers were able to raise both short and long term money at record low interest rates that compare favourably with dividend yields on their stocks thus incentivising higher leverage. Leveraged loan[1] sales are approaching a three-year high, enabling companies to slash borrowing costs, as yields relative to junk bonds reached the narrowest in many months.

Asset bubbles may reemerge

3.6 The low and benign interest rates in advanced economies accompanied by lower market volatility since the crisis have given rise to fears of asset bubbles in various markets (Charts 3.2 and 3.3). A low yield environment encourages investors to enter into 'crowded trades' such as emerging market assets. Bank of Japan has opined that "such easy monetary conditions are likely to contribute to the emergence of another bubble" (Governor Masaaki Shirakawa, October 2010).

Chart 3.3 : Prices (US$) of ETFs in Various Assets Listed in US[4]



Source : Bloomberg

[1] A loan provided to a company that already holds large debt on its balance sheet and therefore carries a higher risk of default. Such loans are arranged typically through a syndicate and given to firms perceived to be good candidates for turnaround. Such loans are often used in leveraged buy-outs (LBOs) of firms.

[2] ETFs, which are growing in popularity among international investors, have been used to depict movements in various asset classes.

[3] Barclays ETFs (iShares) listed in US stock exchanges for various assets classes have been used to depict their movement. TLT is the iShares Barclays 20+ Treasury Bond Fund and tracks the eponymous Index. It is composed of Treasury bonds of maturities higher than 20 years. HYG refers to the iShares iBoxx $ High Yield Corporate Bond Fund. LQD and IAU are similarly the iShares iBoxx $ Investment Grade Corporate Bond Fund and iShares Gold Trust respectively.

[4] EEM refers to Barclays iShares MSCI Emerging Markets Bond Index Fund and seeks to track the MSCI TR Emerging Markets Index of equities. BKF stands for the MSCI BRIC Index Fund for equities. GSG is the iShares S&P GSCI Commodity-Indexed Trust.

Moral hazards of accommodation

3.7 The above developments raise the spectre of increased systemic leverage with potentially disruptive effects when normalisation of monetary policy starts. The Japanese experience with a long period of deflation fighting measures including quantitative easing shows that given the low cost of forbearance in a low interest rate regime, banks tend to have a lesser incentive to monitor underlying credit weaknesses of the borrowers and loans may be extended/restructured more liberally. New credit may also be extended on overoptimistic assumptions of servicing capacity based on current low interest rates. Such actions may impact the credit quality of the loan portfolio of banks and the health of their balance sheets. All of these raise the spectre of increased systemic leverage.

3.8 A prolonged period of very low interest rates (Charts 3.4 and 3.5) carries several risks for financial markets, especially if economic decisions are taken by private players, including banks, on the assumption that the accommodative policy stance will continue indefinitely. They could start relying on central bank facilities on a routine basis creating dependencies on policy support.

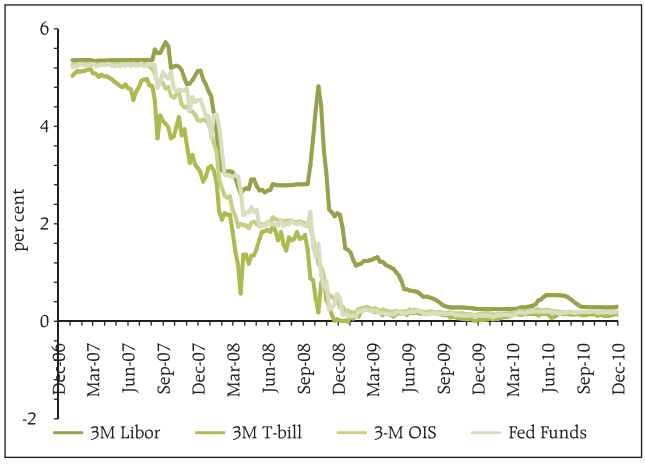
Tensions over Currency Valuations

3.9 Easy monetary policy followed in advanced countries, especially the US, has led to a weakening US dollar (Chart 3.6). Japan intervened in mid-September 2010 as its currency closed in on its all-time high against the US dollar. Central banks in several EMEs have also responded with stepped up foreign exchange market intervention. Persistence of accommodative policies could lead to tensions over currency valuations, especially amongst countries enjoying large current account surpluses with the US.

Domestic Financial Markets

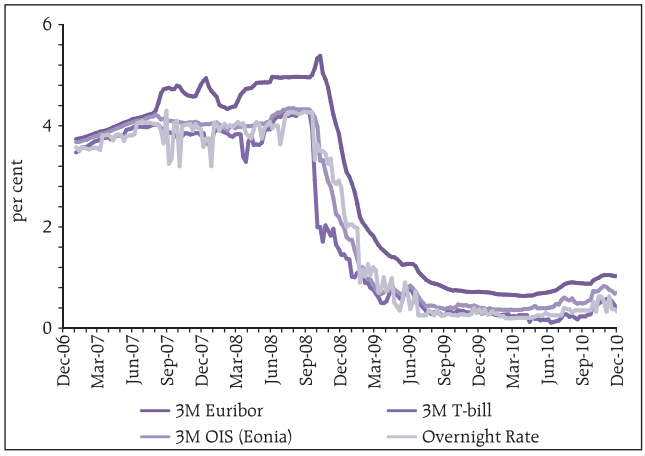
3.10 The domestic financial markets functioned in an orderly manner since March 2010 though some strains in inter-bank liquidity persisted. The growth prospects of the Indian economy coupled with higher yield has attracted capital flows into Indian financial markets. While such flows aid in funding the current account deficit, large and lumpy flows can distort valuations in financial markets and fuel asset bubbles.

Chart 3.4 : US dollar Money Market Rates (3-month and overnight)



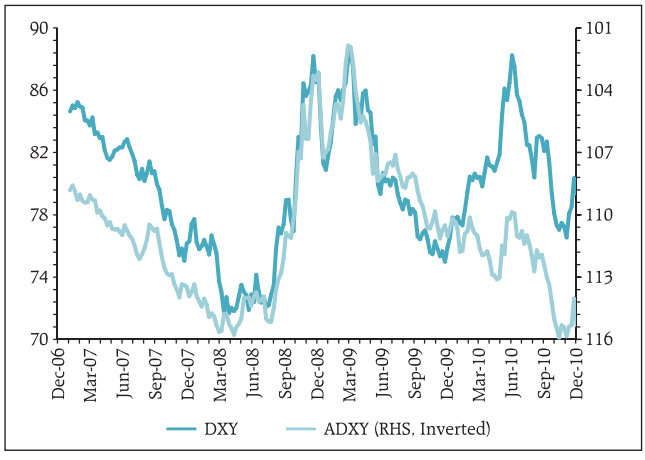
Source : Bloomberg

Chart 3.5: Euro Money Market Rates (3-month and overnight)



Source : Bloomberg

Chart 3.6 : Value of the US dollar vis-à-vis Developed (DXY) and Asian Currencies (ADXY)

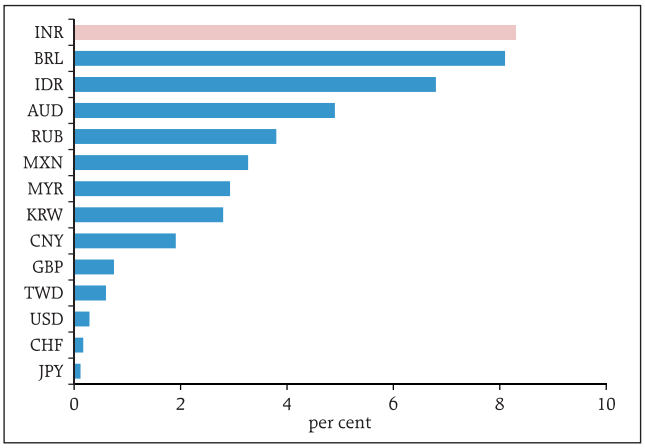


Source : Bloomberg

3.11 Excessive capital flows remain one of the key risks faced by the Indian economy. India, like many emerging markets especially in Asia, has recovered from the financial crisis-led slowdown much faster than the advanced world. Significant policy tightening in India has resulted in widening of the interest rate differential vis-à-vis advanced economies (Chart 3.7). In an environment of low risk aversion, it is not surprising that capital flows to the country have risen in tandem with the increase in the interest rate differentials in recent months (Chart 3.8).

3.12 Large capital flows potentially create imbalances in the near term especially when, in the absence of large and deep capital markets, incremental growth in absorption capacity[5] fails to match the pace of flows.

Chart 3.7 : Annualised Yields on 3-month Deposit Rates in Various Currencies as on December 15, 2010

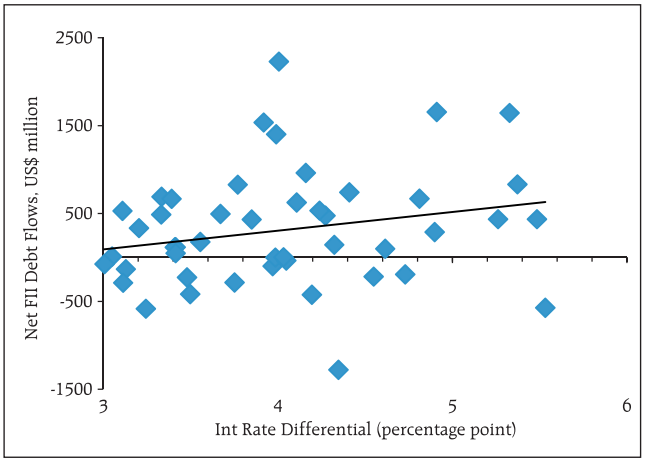


Source : Bloomberg

Increased reliance on non-FDI flows

3.13 A potentially worrying feature of capital flows to India has been the dominance of portfolio flows as compared to the more stable investment flows. Foreign portfolio capital inflows (gross) constituted more than half of all capital inflows last year. Such capital is typically volatile and requires watchful management. Further, by their very nature, such portfolio flows tend to inflate Real Effective Exchange Rate (REER) (with potential impact on trade balance) as compared to FDI flows which in fact have reduced REERs in some regions[6].

Chart 3.8 : Monthly Net FII Debt Flows versus 10-year Yield Differential between US and Indian Sovereign Bonds over the Last 4 Years



Source : Bloomberg

Rising prominence of the finance channel increases contagion risks

3.14 There are four channels of transmission of shocks viz. trade, finance, commodity prices and expectations. In India, an analysis of the trends in cyclical synchronisation shows that the finance channel of transmission was more pronounced during recent periods, reflecting the strengthening of the global integration of the Indian economy through increasing financial flows. Financial variables, viz., bank credit, capital inflows, call rate and the Sensex explain as much as 50 per cent of the variation in GDP for data from 1996 to 2009 using a vector autoregressive model. The impact of the financial channel was pronounced on account of capital flows (RBI, July 2010).

[5] Generally the current account deficit of a country constitutes its absorption capacity.

[6] Damyana Bakardzhieva, Sami Ben Naceur, and Bassem Kamar, The Impact of Capital and Foreign Exchange Flows on the Competitiveness of Developing Countries, IMF, July 2010

3.15 This increasing synchronisation also raises the risk of the disruptive impact of sudden reversals on domestic markets. IMF's econometric tests on portfolio flows to emerging markets suggest that such flows (Charts 3.9 and 3.10) tend to be "persistent" and have "high degrees of autocorrelation" over several months. The inflow of such funds into EM countries, like India, is often self reinforcing with success in initial investments by a fund leading to further allocation by the same fund as well as emulation by others.

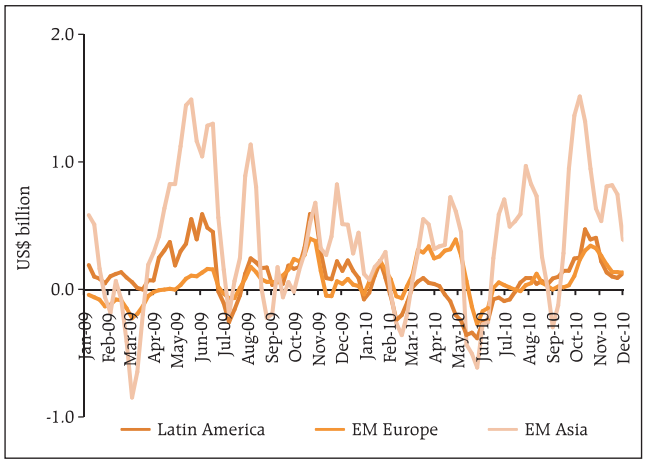
3.16 Typically, flows are expected to be more stable under orderly conditions in global financial markets whereas any rise in risk aversion as indicated by the VIX Index (popularly referred to as the "fear gauge") could lead to a reduction or even reversal of flows (Chart 3.11). As mentioned earlier, the strains have resurfaced in global markets and a return to higher volatility and risk aversion cannot be ruled out.

3.17 The transmission of shocks from advanced economies is accentuated by the presence of international banks through affiliates. While the presence of these banks has benefits in terms of enhanced efficiency, liquidity provision, risk-sharing, and overall superior growth opportunities, it also enhances the ease of transmission of global shocks to the domestic economy, for example through volatilities in cross-border lending. "Domestically-owned banks in emerging markets are not immune to transmission and associated lending growth contraction. The *ex ante* balance sheets of source countries appear to matter for the *ex post* consequences"[7].

Approach to capital flows

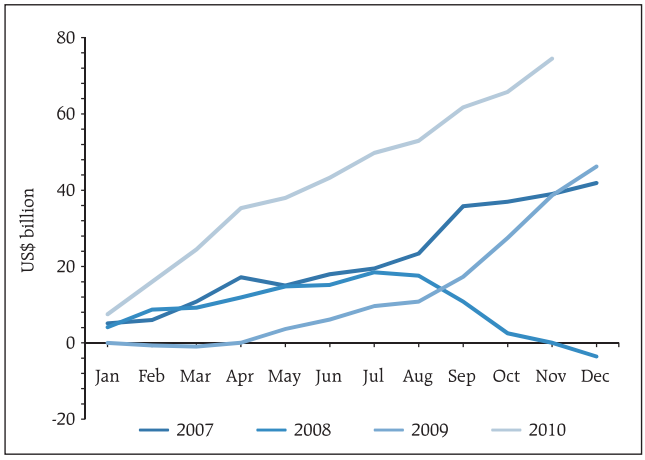
3.18 There are no easy options to managing excessive capital flows. Emerging markets like India are continuing to face the usual dilemma of the impossible trinity. There is a consensus emerging that macroprudential tools are more appropriate than monetary policy to address excessive capital flows. In the Indian context, a combination of price, end-use restrictions and quantity based measures have been calibrated to tackle such flows. Capital controls as

Chart 3.9 : Emerging Market (EM) Dedicated Regional Equity Fund Flows in 2010 (weekly, smoothed in US$ billions)



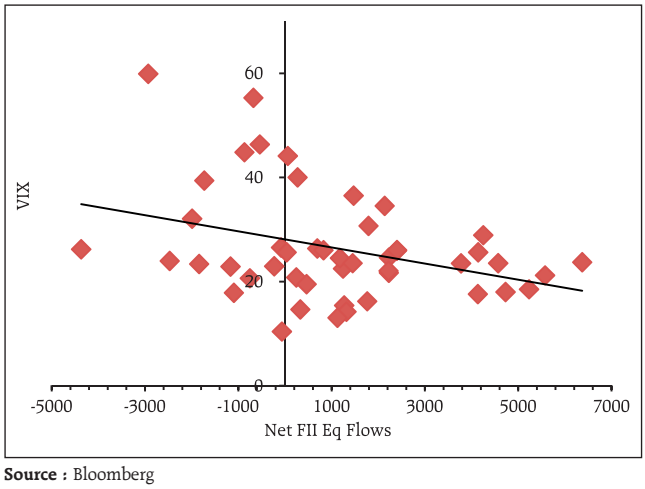
Source : IIF

Chart 3.10 : Cumulative EM Fixed Income Capital Flows



Source: IIF

Chart 3.11: Monthly Net FII Flows versus VIX Index over the last 4 years
(in US$ million)



Source : Bloomberg

[7] Global Banks and International Shock Transmission: Evidence from the Crisis, Nicola Cetorelli, Linda S. Goldberg, Federal Reserve Bank of New York, May 2010

options for capital account management can, in theory, help in cherry picking of flows. But such controls can be circumvented. The Reserve Bank's policy toward capital account management is conscious of such possibilities.

Foreign exchange markets: Rising integration

3.19 The exchange rate displayed two-way movements consistent with the Reserve Bank's policy of maintaining orderly conditions in the market rather than targeting any level of the exchange rate. The Reserve Bank's exchange rate policy is designed so as not to intervene in foreign exchange markets if capital flows are "driven by changing economic fundamentals". Its exchange rate intervention is limited to absorbing lumpy and volatile flows that threaten macroeconomic and financial stability (Governor D. Subbarao, October 2010). The broad traded range during the period of review was ₹44 to ₹47 against the US dollar.

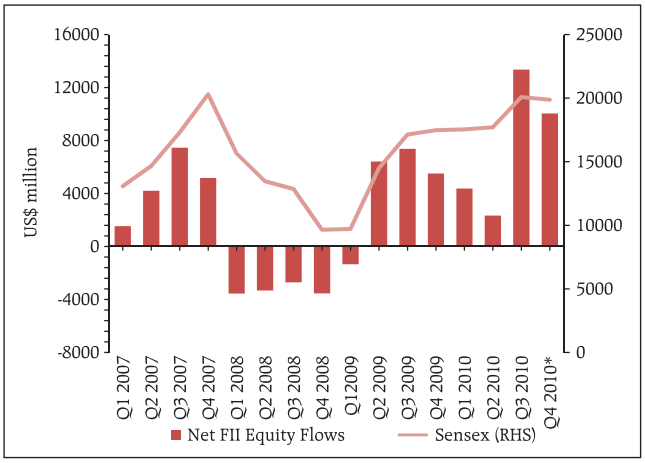
Volatility aligning to international levels

3.20 Increased correlation across markets and faster and easier "pass through" of global disturbances to the domestic markets has led to increased volatilities, especially in the domestic equity and currency markets. Sentiments in Indian foreign exchange market are often aligned to the broad US dollar strength or weakness, generalised risk appetite or aversion and FII purchase or sale activity in the equity market (Chart 3.12). As a result, volatilities in domestic foreign exchange market have started aligning to those of advanced markets (Chart 3.13). This carries the risk of higher hedging costs for the real sector.

Trends in the currency futures market

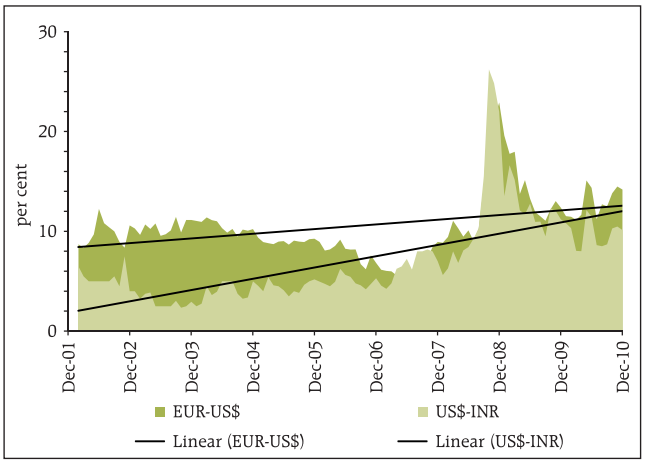
3.21 With the launch of the United Stock Exchange of India (USEI) in September 2010, currency futures in India are traded on three exchanges. In a departure from trends globally, turnover in currency futures is comparable to that of OTC foreign exchange forwards and swaps markets. Trading volumes in currency futures, particularly with the start of the USEI, have risen sharply without a concomitant rise in open interest which suggests preponderance of speculative day-trading (Chart

Chart 3.12 : Quarterly FII flows and Sensex



Source: Bloomberg
*until 15 December 2010

Chart 3.13 : 3 Month Implied Vols in US$/INR and EUR/US$



Source : Bloomberg

3.14). Such speculative activities, if prevalent, could be facilitated by low transaction costs (as exchanges are not charging transaction fees) and the non-applicability of the securities transaction tax. At the same time, tighter spreads on currency futures are indicative of higher liquidity. While this is encouraging, undue reliance on 'speculators' for market liquidity can be disruptive during periods of market stress.

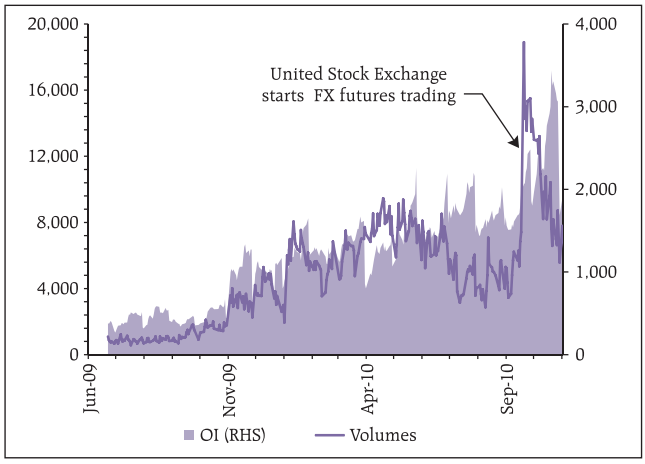
Large offshore Rupee market

3.22 Recent estimates[8] point to a large and growing share of offshore currency markets - 52 per cent of total daily turnover for foreign exchange forwards [Non-deliverable Forward[9] (NDFs)] and swaps and 34 per cent for interest rate swaps, forward rate agreements and interest rate options (though there is some understatement of the size of the onshore market). Prevalence of a large offshore market raises systemic concerns with regard to both monetary policy and financial stability as the offshore and onshore markets do not operate in silos.

3.23 An internal study looking to gauge the inter-linkages between the onshore and offshore market points out that change in NDF premia Granger-cause changes in onshore forward premia. In turn, the changes in the onshore spot rate Granger-cause the same in NDF premia. Such linkages cause a broad alignment between the onshore and offshore markets (Chart 3.15) that makes pass-through of external shocks easier.

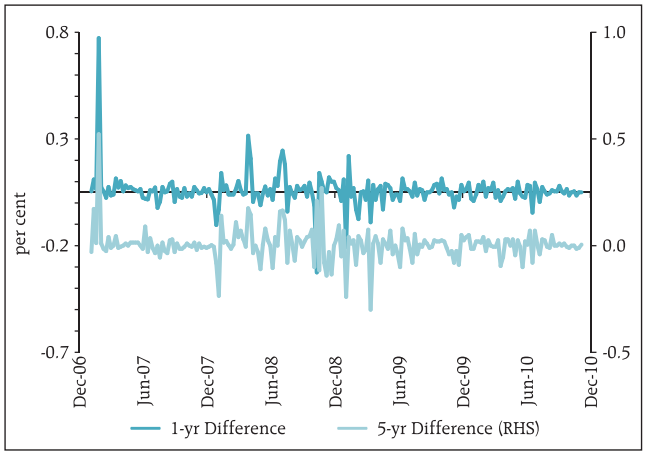
3.24 In the Indian context, the major participants in the NDF markets are understood to be hedge funds and multinational firms (both domestic and foreign). Such participants tend to be guided more by international developments than domestic factors. Adding to the risks arising from NDF markets is the fact that information and flows going through in such markets are not available in a reliable and transparent manner. This opacity prevents the central bank from having an adequate early warning mechanism to tackle balance

Chart 3.14: Trend in Volumes (₹crore) and Open Interest (in 000s) on all three exchanges for USD-INR Futures in 2010



Source : NSE, MCX-SX, USEI

Chart 3.15 : Difference between Offshore and Onshore OIS Rates in 1-year and 5-year Maturity



Source : Bloomberg

[8] BIS Triennial Central Bank Survey of 2010

[9] Non-deliverable Forward is a forward contract in which counterparties agree to settle the difference between the contracted NDF price and the prevailing spot price on maturity in cash. Such transactions typically take place in an offshore location in order to overcome regulations banning a certain current or capital account transaction or owing to convenience of operating from an offshore venue. In India, the current account transactions are liberalized and can be freely undertaken onshore while there are some capital account transactions that are prohibited.

sheet adjustments and disorderly winding down of large one-way bets driven by market players.

Indian money markets: resilient with a few soft spots

3.25 Money market rates increased as policy rates were hiked and liquidity conditions tightened. Call money rates rose from around 3.5 per cent to 7 per cent in mid-December 2010. CP and CD rates have risen more sharply than warranted by rate hikes by the Reserve Bank. 3 month CD/CP rates have scaled 9 per cent in mid-December from around 4 to 5 per cent at end-March 2010 (Chart 3.16).

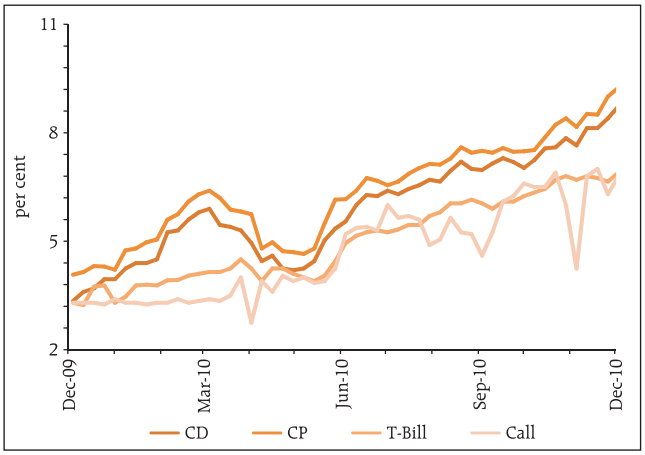
Liquidity deficit requires watchful management

3.26 Liquidity conditions exhibited some strains initially due to large payouts to the Government for allocation of 3G spectrum and Broadband Wireless Access. Tight money market conditions have been accentuated by structural factors such as significantly above-trend currency expansion and relatively sluggish growth in bank deposits even as the credit growth accelerated in 2010-11. In recent weeks, liquidity tightened beyond the Reserve Bank's "comfort level", as a result of build-up of government balances (Chart 3.17).

3.27 The strains are being managed through a combination of policy measures and active liquidity management by the Reserve Bank aimed at bringing primary liquidity and liquidity deficit closer to the comfort zone and to stabilize overnight interbank rates. The latest measures in this regard include a reduction in the Statutory Liquidity Ratio by one percentage points to 24 per cent and conduct of open market operations for purchase of securities through auctions. These actions announced in the Mid-Quarter Monetary Policy Review on December 16, 2010 can potentially inject liquidity of the order of ₹48,000 crore on an enduring basis.

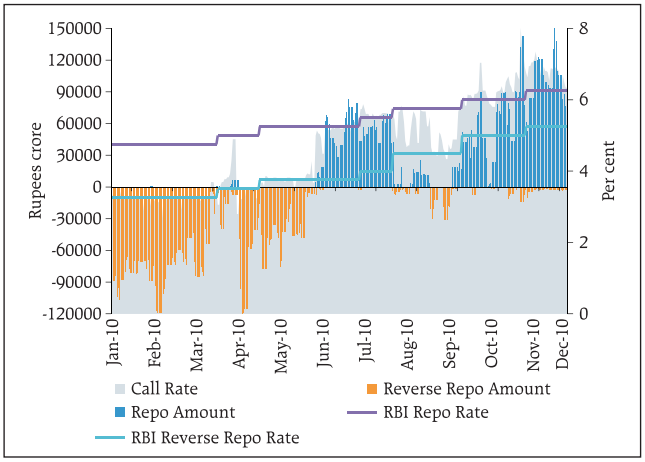
3.28 Persistent and excessive deficits induce unpredictability in both availability and cost of funds, making it difficult for the banking system to price their liabilities/assets or sustain credit delivery. The success of the latest policy measures is contingent upon the market's response to the OMO purchase auctions. The liquidity situation will require watchful management in the coming months.

Chart 3.16 : 3 Month and Overnight Rates



Source : Bloomberg

Chart 3.17 : Call Rates, Liquidity Adjustmennt Facility (LAF) Corridor and its Usage



Source: RBI

Inter-bank markets substantially collateralised but remain largely overnight

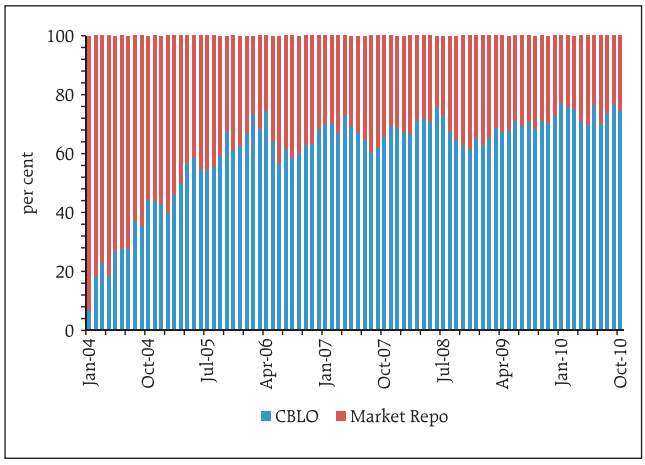
3.29 The focus of the Reserve Bank has been to encourage collateralisation, development of an appropriate yield curve and better risk management by market participants. Policy measures in this regard include restricting access of the call money market to banks and primary dealers, widening the availability of products, putting in place guaranteed clearing of government securities transactions, addressing information asymmetry through trade reporting, monitoring and appropriate disclosure requirements. Accounting treatment of repo transactions has been revised to reflect the economic essence of repo as a collateralised instrument and to reflect the fair picture of risks faced by lenders and borrowers.

3.30 The collateralised market exists in two forms: Market Repo and Collateralised Lending and Borrowing Obligation (CBLO)[10]. Repos in government securities permitted only to eligible participants, mostly regulated entities, are settled through a CCP (CCIL). The market has shown distinct preference for the CBLOs as it offers greater flexibility, much like a tri-party repo (Chart 3.18).

3.31 Insurance companies and mutual funds are the major providers of funds in the inter-institutional money market. Their shift from the call money market has contributed to the collateralisation of the overnight money market (Chart 3.19).

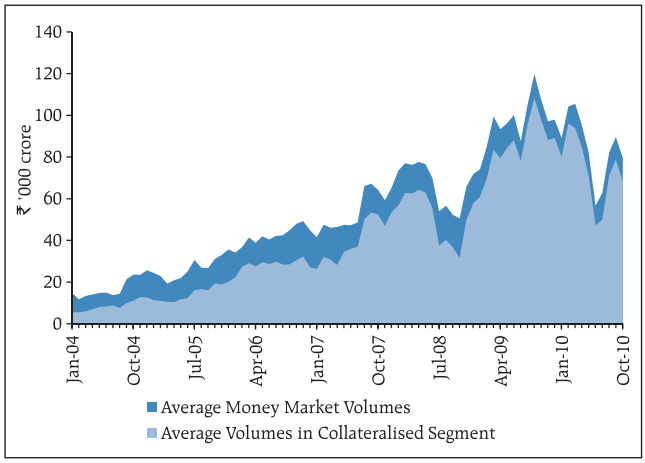
3.32 Repo market creates a strong link between asset prices (collateral value) and funding costs for institutions through the process of margining. While a credit squeeze (liquidity hoarding in a downward market by cash lenders) helps the cash lender's position, it forces borrowers in the repo market into deleveraging of illiquid assets (earlier offered as collateral). This leads to investor concerns about counterparties which feed into funding concerns for financial institutions. For India, this is not an issue (so far) because the repo market is almost entirely in government securities and banks as borrowers have recourse to central bank funding against government securities on a daily basis under LAF.

Chart 3.18 : Share of Collateralised Lending



Source: CCIL

Chart 3.19 : Composition of Indian Money Market



Source: CCIL

[10] CBLO is a money market product conceived and developed by CCIL. It can be traded with guaranteed settlement at CCIL among participants and has a maximum tenor of one year.

Intraday volatility in call rates

3.33 Call money rates generally stayed within the LAF corridor while the corridor itself was reduced by 50 basis points in line with the attainment of greater normalcy in global and domestic financial markets. However, call money market rates in the country often display intraday volatility. Volatility tends to increase towards the end of the day in thin market conditions when some banks seek funds to cover unexpected Real Time Gross Settlement (RTGS) flows. The LAF facility operated by the Reserve Bank once every morning proved to be inadequate during stressful liquidity conditions. Considering this aspect, the Reserve Bank has decided to conduct LAF twice a day – one in the morning and another in the second half of the day.

Non-uniform distribution of excess SLR securities leads to volatilities in call rates

3.34 Recourse to liquidity under LAF is dependent upon availability of government securities in excess of mandatory Statutory Liquidity Ratio (SLR) holdings. Since the distribution of excess SLR holdings is not uniform across banks, those short on funds and excess SLR securities have to depend on other banks to access funds from the Reserve Bank. At times, such indirect access is constrained by availability of limits - interbank as well as regulatory (lending and borrowing as a proportion of capital funds) limits. In view of such market microstructure issues, the call money rates tend to breach the LAF corridor in tight liquidity conditions (Chart 3.17).

Impact of government balances on money market rates

3.35 The Reserve Bank as holder of Central Government balances receives tax payments at regular intervals, the flow back of which is dependent upon government spending. Pay-ins by the telecom companies (post auctions for 3G on mobile and Broadband and Wireless Access services) to Central Government stressed the liquidity conditions in May and June 2010. However, the tight liquidity conditions continue to persist on account of structural factors as indicated in paragraph 3.26 of this Chapter. Going forward, in the background of greater exchange rate flexibility and increases in the tax/GDP ratio, Government balances may become more critical in affecting liquidity conditions.

Idiosyncrasies in development of term money volumes

3.36 In India, banks, primary dealers, insurance companies and mutual funds typically lend temporary surpluses only in the overnight markets making the term money market very shallow. To an extent, the lack of a term money market is due to the balance sheet structure of the banks in India. Inter-bank claims or purchased funds[11] account for a small proportion of the banks' assets in India. The liability side is deposit driven, with emphasis on low cost current account and savings account (CASA) deposits, reflecting the "lend-and-hold" model of Indian banking as opposed to the originate-and-distribute model that relies more on wholesale market funding. This feature has, however, lent stability to the banking system.

3.37 In addition, there is the general issue of the public sector banks (PSBs) not being active in the financial markets. Borrowing in the call money market segments is dominated by foreign and private sector banks that hold less than 30 per cent of the banking system's assets. PSBs comfortably raise wholesale resources through Certificates of Deposit (CDs) and bulk deposits when warranted or deploy short-term surpluses through large ticket corporate loans at a premium over the prevailing call money or reverse repo rate, even when on a risk adjusted basis a term loan to another bank may have been equally attractive or prudent. The inertia of PSBs evidenced in financial markets is possibly a result of their focus on traditional banking products coupled with an organisational structure which does not incentivise active treasury management.

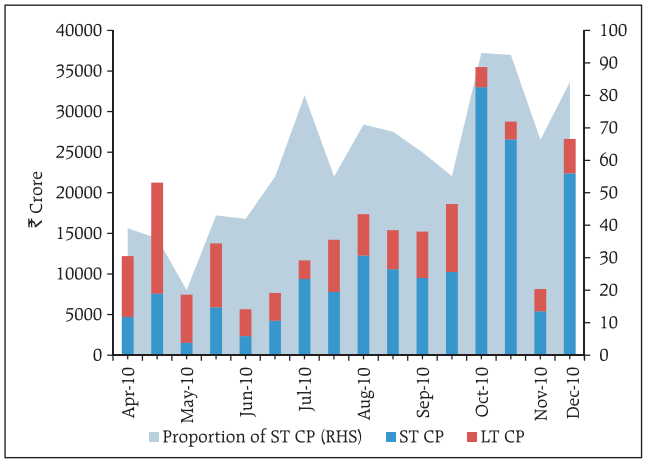
[11] Typically, banks can provide their liquidity needs by two methods: *stored liquidity* and/or *purchased liquidity*. The former utilizes on-balance sheet liquid assets and a well-crafted deposit structure to provide all funding needs; the latter uses non-core liabilities and borrowings to meet funding needs. CFSA Report (2009) recommends that "It may be worthwhile considering specific regulatory capital charge if a bank's dependence on purchased liquidity exceeds a defined threshold".

3.38 CDs represent a term instrument which is used by the major participants in the money market i.e. banks, PDs, MFs and insurance companies. Volumes in the CD market are high and growing - outstanding amount of CDs is nearly ₹3,53,000 crore (as on December 24, 2010) with fortnightly average issuance size of around ₹25,000 crore. Though the CD rates are not pure inter-bank rates (i.e. free from reserve requirements, stamp duty, etc), they are still largely reflective of the term structure. Measures such as (i) polling of 3, 6, 9 and 12 month CD rates (ii) wider dissemination of primary market details (iii) trading on the NDS platform for enhancing price transparency (iv) reporting of CD issuances (to the Reserve Bank) by banks through a return filed through the Online Financial Reporting System (OFRS) and (v) rationalising the stamp duty structure on CDs can provide impetus to the growth of a robust CD market in India.

Shortening of Maturity patterns of Commercial Papers (CPs)/ CDs

3.39 Mutual Funds are the major investors in CPs and CDs. The issue of circularity of funding whereby banks invest in instruments of mutual funds who in turn invest in CPs and CDs was highlighted in the FSR of March 2010. In recent months, significant growth in CPs and CDs of tenor up to 3 months was evidenced. This trend appears to be largely driven by regulatory instructions requiring mutual funds and asset management companies to mark-to-market all money market instruments having residual maturity greater than 91 days (Chart 3.20). This trend could potentially raise liquidity and rollover risks for the issuing entities in times to come.

Chart 3.20 : Shifting Maturity Pattern of CPs in 2010 (in per cent of Total Issuance for Composition)

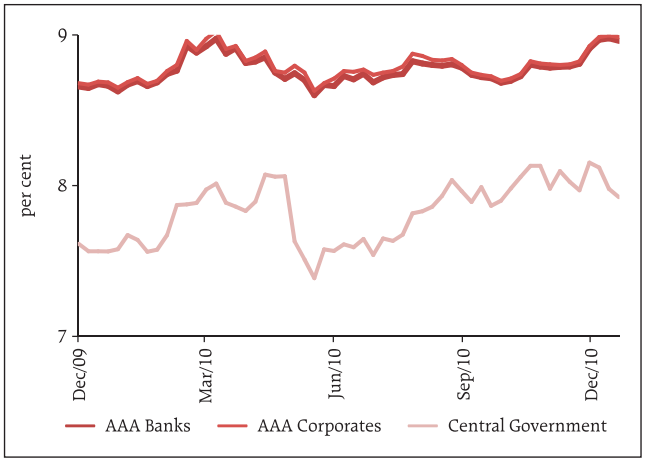


Source : RBI

Domestic Bond Markets: More depth and liquidity needed

3.40 Since the last FSR, the bond yields at the shorter-end have firmed up considerably in response to rate hikes and the tight liquidity conditions in the money market. The yield curve is much flatter now. Corporate spreads in the 5 and 10-year sectors have narrowed as the yields on government securities have risen more in comparison, possibly due to the large primary market supply (Chart 3.21).

Chart 3.21 : 10-year Bond Market Rates



Source : Bloomberg

3.41 Bond markets in India and elsewhere in EMEs are characterised by lack of incentives to trade actively. A supply-heavy market on account of large government borrowings is a key factor behind the lack of active trading interest. The Banks and insurance companies are statutorily required to maintain a relatively high proportion of liabilities in approved securities, mainly government bonds (Chart 3.22). For financial stability reasons, regulations allow banks in India to hold the entire mandated proportion under the Held-till-Maturity (HTM) category which also reduces the tradable portion of securities portfolio held by banks.

Hedging possible but not preferred

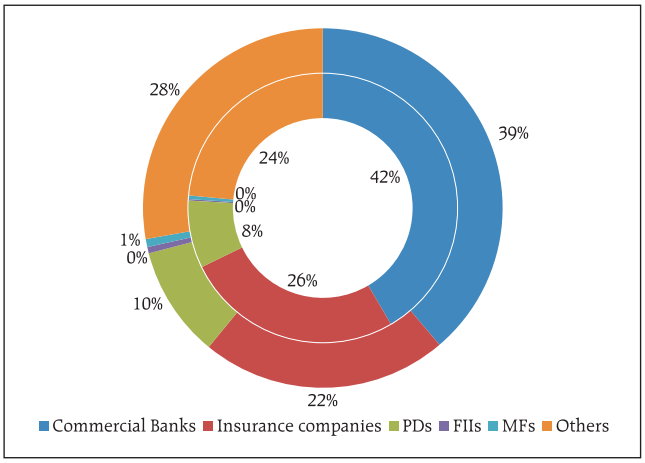
3.42 Interest rate swaps (IRS) were introduced in India for hedging interest rate risk of investment portfolios. The market for interest rate swaps is fairly liquid up to 5 years though hedging a government bond portfolio using IRS involves a significant degree of basis risk.

3.43 To an extent, the lack of incentive to manage risks dynamically works against the success of hedging products like the Interest Rate Futures (IRFs). The futures contract is settled by physical delivery and since most of the securities in the deliverable basket, including the cheapest to deliver, are illiquid, pricing of the contract is not easy. Moreover, the duration of bank portfolios is lower than that of the underlying of the 10-year bond futures contract and therefore, it is not best-suited for hedging purposes. In order to address these issues, the Reserve Bank is, in consultation with the Securities and Exchange Board of India (SEBI), examining the introduction of cash-settled IRF contracts in 2-year and 5-year notional coupon bearing Government of India securities and 91-day Treasury Bills.

Corporate bond market growing but slowly

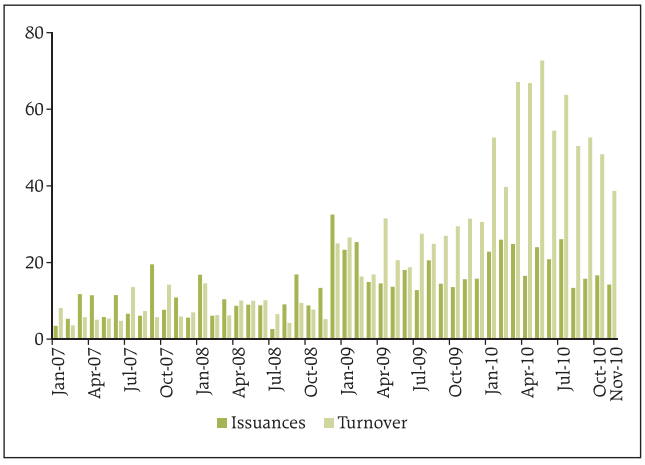
3.44 A vibrant corporate bond market is considered imperative for bringing about the much needed shift in the Indian financial system of disintermediation away from the banks. However, inspite of persistent policy focus, this is one area where the outcomes have been less than satisfactory. While volumes in the secondary market have increased four-fold between 2007 and 2010 (Chart 3.23), the absolute amounts

Chart 3.22 : Holding Pattern of Government Bonds in March 2007 (Inner) and September 2010 (Outer)



Source: RBI

Chart 3.23 : Monthly Corporate Bond Trading Turnover and Private Issuances in 2010 (in ₹ 000 crore for issuance)



Source : SEBI

remain low. Many proactive policy measures have been taken in the recent past to improve the market microstructure necessary for facilitating marketisation of corporate bonds, including improving the issuance procedures, standardisation of market conventions, putting in place efficient trading and settlement mechanism and enabling repoability of corporate bonds. Trades in corporate bonds have to be mandatorily reported and are centrally settled[12] though the secondary market is not liquid enough to facilitate guaranteed settlement .

3.45 However, the intractable issues pertain to the structural elements relating to the lack of appetite for credit risk among non-bank institutional investors, particularly insurance funds and pension funds. While part of it can be attributed to discomfort with the existing legal framework for enforcing security and the bankruptcy regime, large supply of risk-free sovereign securities and securities of quasi-sovereign entities, including financial institutions, works as a disincentive to go down the credit curve. Some tax related issues also remain to be addressed.

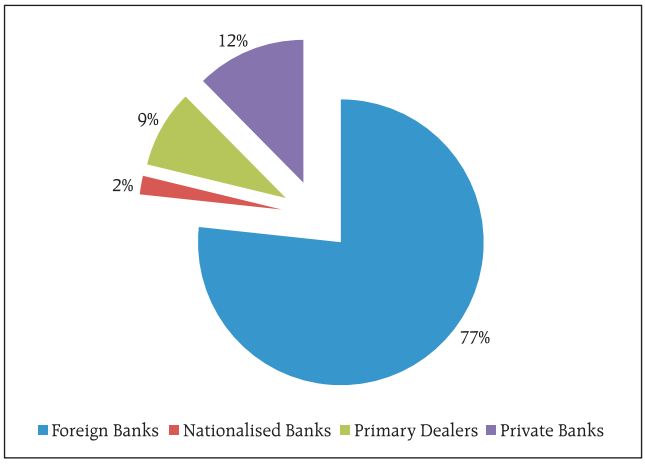
3.46 A case has been sought to be built in favour of allowing banks to guarantee bonds. While this may be expedient, the underlying objective of de-risking the bank balance sheets will not be met. Further, this would hamper the process of true price discovery for credit risk in the market through corporate bonds.

3.47 Going ahead, the proposed introduction of Credit Default Swaps (CDS) could provide a fillip to the development of the domestic corporate bond markets. The introduction of CDS in India will have to be calibrated with the introduction of standardised contracts with centralised reporting and standardised day-end pricing of outstanding contracts initially, to be followed by migration to CCP cleared and guaranteed settlement over a period of time, as has been the international experience in this respect (Box 3.1).

Concentration in Indian financial markets

3.48 The OTC derivative markets in India, as also the government securities market to an extent, display a significant degree of concentration. While concentration in financial markets is not unusual, the domination by a few banks in the OTC interest rate derivatives market (Chart 3.24) heightens the risks of illiquidity during times of market stress. During stressful times, market makers tend to withdraw their services in order to use their inventory, counterparty limits and liquidity to protect their own portfolios. Each participant has an incentive to withdraw, and if they all do so; the worst case scenario, markets can become dysfunctional[13] . The skewed participation also raises the risks of faster transmission of disturbances from global financial markets.

Chart 3.24 : Market Share (by Notional Amount) in IRS (MIBOR) for October 2010



Source : CCIL

[12] Repo in corporate bonds was allowed in March 2010 after ensuring settlement on DVP basis through transitory pooling accounts of exchange clearing houses with the Reserve Bank.

[13] Gary J. Schinasi, Restoring Financial Stability, 2006

Box 3.1: Proposed Safeguards in Credit Default Swaps (CDS)

Credit risk transfer products like CDS have the potential to change an institution's risk profile, destabilize the cash market and increase systemic risk. Build-up of excess leverage, opacity and counterparty risk management emerged as key issues in the financial crisis with regard to Over-the-Counter (OTC) markets, particularly in CDS. In India, CDS is sought to be introduced with adequate safeguards. An Internal Group of the Reserve Bank has suggested that several measures be put in place before CDS is introduced in India for Corporate debt. It has sought mandatory reporting of trades and setting up of a trade repository for capturing the CDS trades before the eventual migration to a centralized clearing system. Some other safeguards suggested in the report to address systemic risks in CDS are:

- Users cannot buy CDS protection without having an economic reason to hedge by way of an underlying bond or portfolio.
- Only financially sound entities with adequate risk management can act as market makers.
- The protection seller in the CDS market shall have internal limits on the gross amount of protection sold by it on a single entity as well as the aggregate of such individual gross positions.
- Participants shall maintain margins in cash or government securities only.
- Protection sellers shall have to fix a limit on their Net Long risk position in CDS contracts, in terms of Risky PV01, linked to a percentage of the Total Capital Funds of the entity. Gross PV01 of all non-option rupee derivatives should be within the 0.25 per cent of net worth of the bank as on the last balance sheet date.
- A reporting platform would collect and make available data to the regulators for surveillance and regulatory purposes and also publish, for market information with a lag, relevant price and volume data on CDS activities such as notional and gross market values for CDS reference entities broken down by maturity, ratings, gross and net market values of CDS contracts and concentration level for major counterparties.

Exchange traded versus OTC design

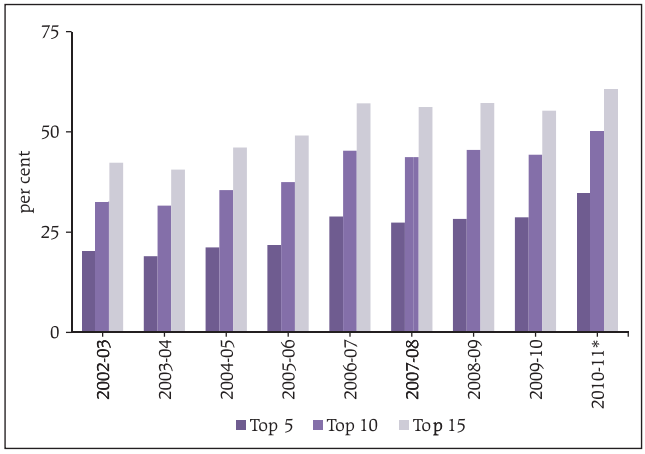
Both CDS indices and Single name CDS trade OTC. While interbank trades in respect of indices are generally cleared through exchange clearing houses, progress in migrating to centralised clearing and settlement in respect of single name CDS contracts has been slow worldwide. An exchange-traded product provides a sound platform for price discovery, which is neutral and independent. Counterparty credit risk gets transferred to clearing houses of exchanges which act as CCPs. Market activity is significantly more transparent and at the same time more anonymous. As the experience with currency products demonstrate, exchange traded contracts can 'crowd in' a variety of participants, thereby deepening the market, reducing bid-offer spreads and market impact cost. Further, exchanges through its day-end (and occasional intra-day margins) make credit valuation adjustment upfront and transparent.

While the merits of CCP settlement are undeniable, the advantages of the exchanges in managing the risk of a diverse class of contracts are largely contingent on the liquidity of underlying contracts. Given the current state of development of the corporate bond market, liquidity in all single name CDS cannot be assured. Large pool of illiquid contracts with the clearing house concentrate risks, provide little netting benefits by way of central clearing to the counterparties and in the event of credit defaults (which tend to be correlated), can be potentially destabilising to the system. Credit risks inherent in illiquid contracts are better managed by banks as it can be dovetailed within the counterparty client limits. Moreover, there are no established benchmarks for margining of credit contracts (unlike foreign exchange futures where the existence of maturity specific exchange rate volatility predated introduction of currency futures). In the absence of such historical data, the margining regime in the exchanges runs the risk of either being too conservative or too low thereby either impairing liquidity or endangering clearing house solvency respectively. These factors have made exchanges reluctant to clear the less liquid segments of the single name contracts and transition to exchange settlement of single name CDSs has been slow in Europe and US notwithstanding a clear mandate to the exchanges for the same.

3.49 Concentration is high in government securities market in terms of both the number of participants and the number of securities actively traded. The top 15 participants accounted for more than 60 per cent of outright trades in government securities in 2010-11 (April to November) (Chart 3.25). Similarly, a single security accounted for over 46 per cent of traded volumes in the government securities market in September 2010 while the top three traded securities accounted for over 75 per cent of the trading volume during the month. Overall, only a tiny fraction (0.43 per cent in September 2010)[14] of the outstanding stock of government debt gets traded on any day. The shallow liquidity in the government securities market lowers the economic utility of market based valuations of securities and limits exit options for the participants during stressful market situations.

3.50 Higher participation by 'larger' banks (in terms of balance sheet size) is critical for better market liquidity. Presently, it is the banks with smaller balance sheets that dominate trading in the secondary markets (Table 3.1). This skewed participation hampers volume growth and makes the market prone to bouts of illiquidity.

Chart 3.25 : Market Share of Participants in Government Securities Trading



Source: CCIL
* April to November 2010

Table 3.1: Share of Banks in Aggregate Size/turnover of all SCBs in September 2010

(in per cent)

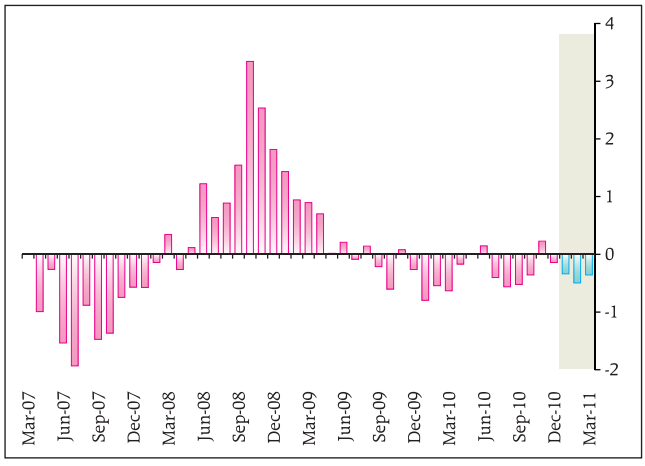
	Balance sheet	Outright G sec	Outright Forex	MIBOR
Public Sector Banks	72.5	14.8	24.4	0.9
Private Sector Banks	19.7	12.2	16.9	12.5
Foreign Banks	7.8	42.0	58.5	78.7

Source: RBI, CCIL

Financial Stress Indicator – healthier conditions forecasted

3.51 The Financial Stress Indicator[15] mirrored the heightened global stress scenario in the third quarter of 2008-09 in the wake of the failure of Lehman Brothers. In response to the swift and calibrated monetary and fiscal measures initiated in India, the FSI has been on the downward trajectory since November 2008. The recent period, as manifested in the FSI, (Chart 3.26) has been stress-free barring two occasions in which small and temporary stress levels

Chart 3.26 Financial Stress Indicator - India[16]



Projections are for period from December 2010 until March 2011
Source : RBI Calculations

[14] Average daily trading volumes in government dated securities, treasury bills and state development loans during September 2010 as a percentage of the outstanding stock of government dated securities, treasury bills and state development loans as on September 30, 2010.

[15] The FSI is designed to capture the contemporaneous severity of the developments as they transpire in domestic financial markets and in the banking sector. It has four components viz. Banking, foreign exchange, debt and equity markets. The Banking component includes sensitivity i.e. beta of banking sector's stock index (Bankex) to broader market (Sensex), spreads on CDs over treasury bills, GARCH volatility of Bankex and growth in real rate of non-food credit of banks. The Forex component includes EMP and GARCH volatility of the US$/INR exchange rate. The Debt segment incorporates changes in the slope of the sovereign yield curve and spreads of CPs over treasury bills in 3 month maturity. The equity component includes level of Nifty and its GARCH volatility. Details of construction methodology were furnished in FSR March 2010.

[16] The projections use univariate time series models (ARIMA, ARCH, and GARCH) to forecast each of the ten component indicators of the FSI from the four broad sectors viz. banking, exchange rate, debt and equity markets. The shaded portion represents the forecast value from December 2010 to March 2011. The mean value is almost zero as FSI is constructed based on standarised value

were discerned. In May 2010, tensions in European sovereign bond market caused volatility across global financial markets while in November 2010, it was volatility in the foreign exchange market as reflected in rise in Exchange Market Pressure (EMP)[17]. Going forward, the financial markets as a whole are expected to remain stress-free during last quarter of 2010-11.

Concluding Remarks

3.52 The exogenous threats to stability of financial markets in India are likely to be more potent than endogenous ones. The two-track recovery in global growth and divergent paths of monetary policy measures between advanced and emerging economies has increased the risk of large and auto-correlated capital inflows with the potential to create imbalances in Indian financial markets, especially if they exceed the country's absorption capacity. Dominance of volatile portfolio flows facilitates sharp reversals (in the wake of external shocks) and could destabilise domestic financial markets. External shocks could arise as a result of higher systemic leverage that is incentivised by the prolonged low interest rate regime. They could also arise as a result of tensions in markets over currency valuations.

3.53 In India, the finance channel for spread of contagion has become stronger than the trade channel in recent years and this could facilitate a faster and wider spread of contagion. Domestic financial markets remained resilient. Banking system liquidity has remained tight beyond the comfort zone of the central bank. The latest measures to ease liquidity are contingent upon the success of the OMO purchase auctions and higher government spending. Volatility in the foreign exchange market may remain high due to increased integration and a growing offshore market. Narrow participation in the interest rate swap market can render it illiquid in times of market stress. Development of the term money and corporate bond markets will be challenging despite there being no serious regulatory impediments. Given the dominant position of banks in the financial sector, active participation from the larger banks is critical for the vibrancy in most segments of the financial markets.

[17] EMP is defined as a function of change in exchange rate, reserve level and MIBOR rate

Chapter IV
Financial Institutions

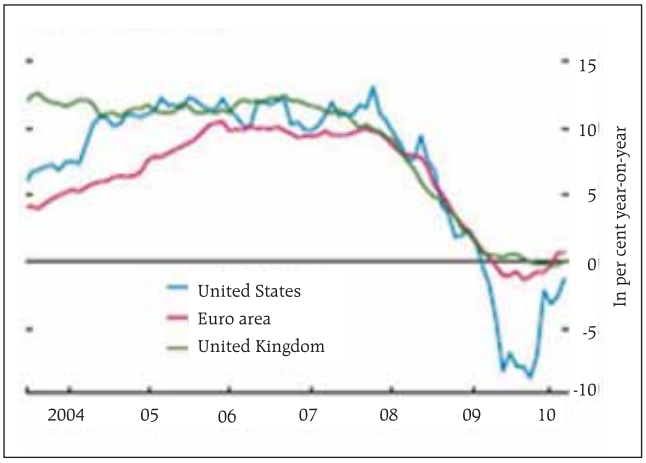
Banks in advanced economies continue to be weighed down by slow credit growth, funding risks, reliance on government and central bank support, contagion impact from the concerns about sovereign debt sustainability, etc. In contrast, the Indian financial system which is largely dominated by the banking sector, remains well capitalised. Some concerns, however, remained. Credit off take has recovered during the first half of 2010-11 but remains off its pre-crisis levels. Deposit growth remained subdued resulting in increased reliance of banks on borrowings (especially certificate of deposits) to fund credit growth. Resultantly, the incremental credit deposit ratio was high especially during the first quarter of 2010-11. Asset quality remained robust though some concerns emanated from the fact that slippages exceeded the rate of growth of advances, and resulted in increased requirements for provisions. The increase in delinquency in the housing loan segment could cause some concern. Housing prices have risen sharply in some centres, leading to the Reserve Bank tightening prudential norms in respect of housing loans. Growing concentration of liabilities in short term while funding assets of relatively longer terms could be a concern if these mismatches persist, though mitigating factors such as high level of low cost deposits and interest rate reset clauses stipulated by banks for longer term loans e.g. infrastructure loans, exist. Several steps to develop alternative financing options for infrastructure may assist in lowering such mismatches. While consolidation in the co-operative sector led to improvements in their financial soundness indicators, progressive tightening of their regulatory regime has brought the regulatory structure for the sector closer to that for the commercial banks. Prudential requirements for the non-banking financial sector were further tightened as the criticality of the sector's inter-connectedness with the banking system and its importance for financial stability is being increasingly realised. Their activities are now being monitored based on their core operational area and balance sheet characteristics. A Banking Stability Index has been introduced in this FSR to assess the dimensional changes in the risks/vulnerabilities being faced by the banking sector. The Index indicates an improvement in the stability of the banking sector over the past few years though dimensional risks associated with the liquidity of scheduled commercial banks have increased as compared to the risks in September 2009.

Post crisis Global scene

Despite improvements in asset quality and capital strength, recovery remains uncertain

4.1 Banks, globally, remained vulnerable to the still tentative global recovery and to the disturbances caused in global financial markets by the sovereign debt crisis which first emerged in May 2010. The EU-IMF bailout package and the publication of the results of stress tests conducted on many large European banks by the EU helped restore some normalcy. But some tensions have emerged again as concerns about Ireland's sovereign debt and the health of Irish banks have resurfaced. Credit off take improved (Chart 4.1), estimate of crisis-related bank write downs declined (from US $ 2.8 trillion in April 2010 to US $ 2.3 trillion in October 2010) and substantial recoveries were made. The banking system in advanced economies, however, continued to remain vulnerable to confidence shocks, and to

Chart 4.1: Banks' Private Credit Growth in Advanced Economies



Source: GFSR Oct. 2010, IMF

excessive reliance on government or central bank support. Concerns about the sustainability of the improved conditions and about imminent further deleveraging remain (on account of funding risks as banks face a "wall of redemptions" in the next couple of years) (GFSR October 2010). Banks improved their capital adequacy ratios even as the global reforms agenda unfurled requiring them to keep aside much higher levels and improved quality of capital than before. However, the banks have a long implementation period extending up to 2019 to adjust to the requirements for higher quality and quantity of capital.

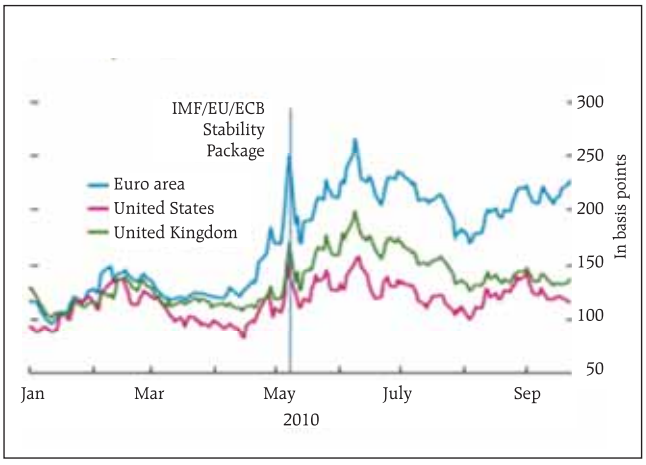
4.2 The above trends were reflected in the movements of the banking sector CDS spreads (Chart 4.2) and in the performance of banking stocks (Chart 4.3). Banking stocks in Asia performed better reflecting the less severe impact of the crisis on Asian economies and their faster recovery.

4.3 International banks had been provided credit guarantees on debt issuances for a limited period during the post-Lehman scenario by advanced country sovereigns and large sums of short and medium term capital were raised by the banks for refinancing their existing assets and fund new ones. The redemption of these bonds over the next two years could prove to be a major refinancing challenge if the vulnerabilities in the funding markets as well as competitive demand for funds from sovereigns remain.

4.4 A more recent threat has emerged from alleged irregularities in mortgage documents in the US housing markets. If documentation problems prove to be pervasive and, more importantly, throw into doubt the ownership of properties pertaining to foreclosed loans and pooled mortgages, the consequences could be severe enough to threaten financial stability.

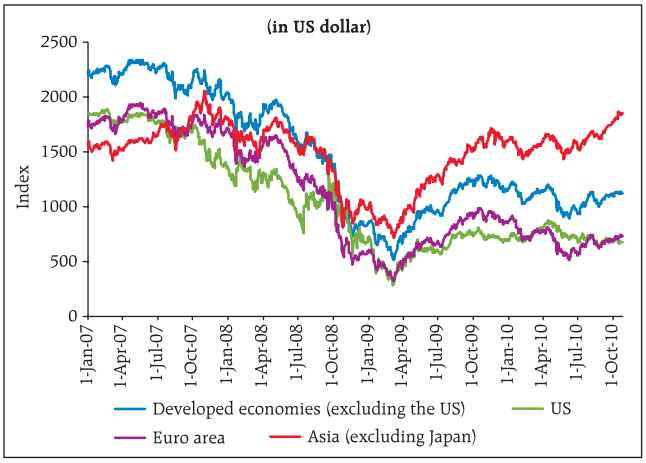
4.5 Despite the financial crisis having revealed funding mismatches to be one of the major structural weaknesses of international banks, there was little incentive for the banks for lengthening their funding maturities in the current low interest rate environment. On the contrary, banks are incentivised to "ride the yield curve" and increase maturity of their assets. Such strategies by the banks along with existence of promise of central banks to keep rates at

Chart 4.2: Banking Sector CDS Spreads



Source: GFSR Oct. 2010, IMF

Chart 4.3: Global Banking Indices



low levels for 'extended period' may create vulnerabilities. Funding markets were vulnerable to negative public announcements as such events could cause short term financiers to pull out, triggering distress sales by the borrowers. Vulnerabilities in global bank funding markets remain a key concern for emerging markets as these could cause disruption in the capital flows, affecting trade credit and impairing the ability of domestic firms to raise capital abroad. In this context, a multinational structure of global banks (operating through sizeable foreign branches and subsidiaries and funding those affiliates locally in the host country and currency) may reduce reliance on cross border funding needs.

4.6 Banks in India remained resilient even during the crisis and do not face the funding and maturity risks of the kind encountering the global banks. However, given the growing integration of the Indian financial sector with the global economy, the CDS spreads of the banks in India as also their equities' performance largely paralleled the global trends, especially trends in Asia (Charts 4.4 & 4.5).

Domestic developments

Scheduled Commercial Banks

Balance sheet

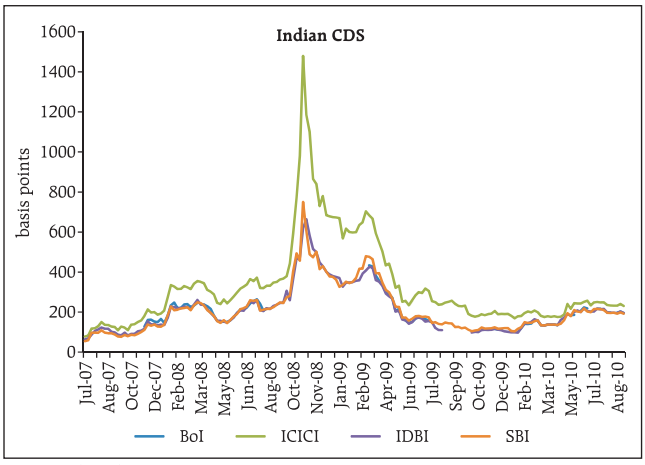
Recovery in credit growth has pulled the balance sheet along

4.7 The size of the balance sheet of scheduled commercial banks grew by 16.49 per cent on a year on year basis as at end September 2010 marking an improvement over the growth rate of 14.86 per cent witnessed during 2009-10. The higher growth was primarily driven by a recovery in credit off take. However, balance sheet growth rates remained off their pre-crisis peaks (Charts 4.6 and 4.7).

Penetration of the banking sector has continued to grow

4.8 The penetration of the banking sector in the economy (as evidenced by the ratio of banking assets

Chart 4.4: CDS Spread of Select Indian Scheduled Commercial Banks

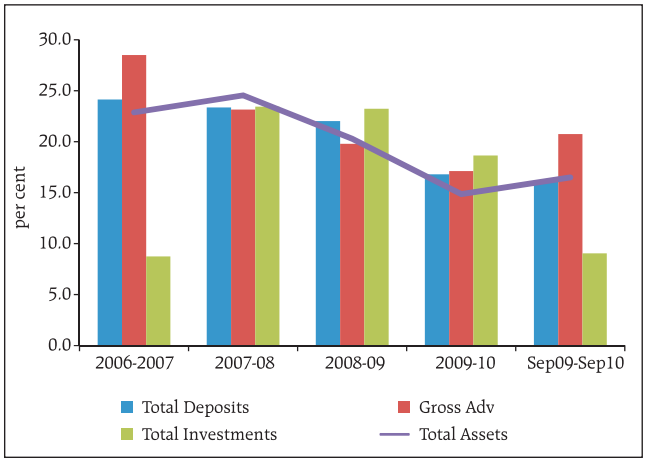


Source: Bloomberg

Chart 4.5: Performance of Indian Scheduled Commercial Banks' Equities (BSE Bankex)

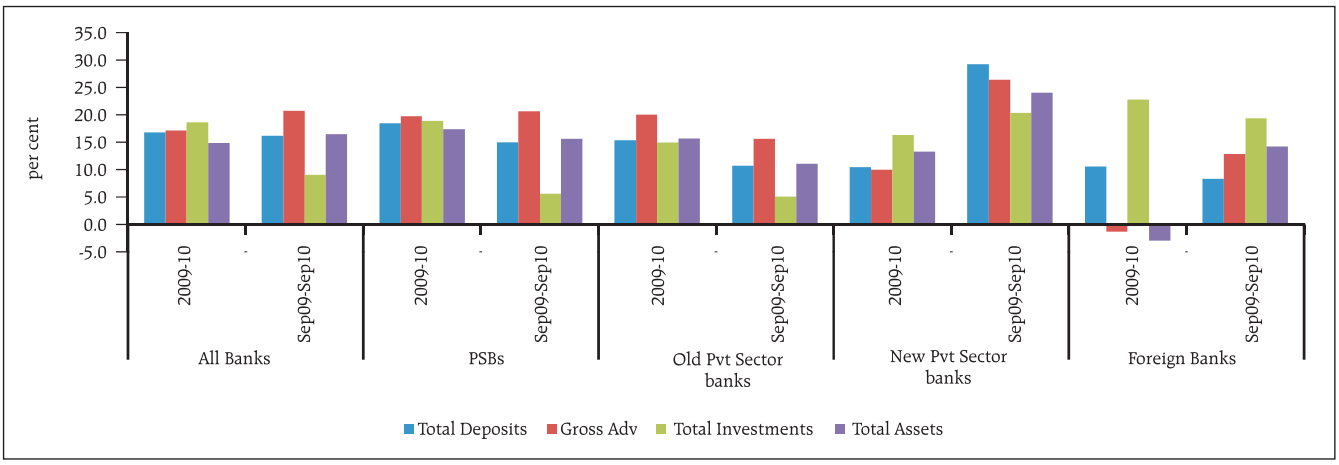
Source: Bloomberg

Chart 4.6: Growth of Deposits, Advances and Investments of the SCBs



Source: RBI Supervisory Returns

Chart 4.7: Trend of Growth in the Important Balance Sheet Items of Bank Groups



Source: RBI Supervisory Returns

to GDP) continued to display an increasing trend, albeit at a slower rate (Chart 4.8).

4.9 The composition of the balance sheet of the domestic scheduled commercial banks continued to be dominated by traditional balance sheet items. The deposits constituted nearly 80 per cent of liabilities and advances comprised about 57 per cent of assets. The investments, which accounted for another 30 per cent of assets, mostly consisted of risk free government securities (about 80 per cent of the total investment exposure) (Chart 4.9).

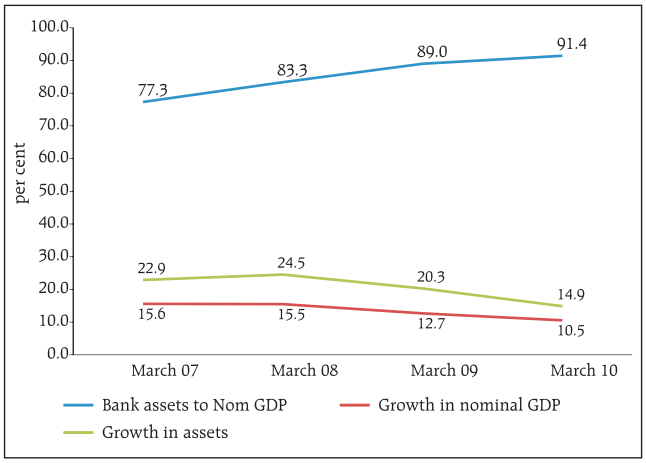
Advances

Respectable but cautious growth was seen

4.10 Credit off-take picked up with advances growing by 20.7 per cent on a year on year basis as at end-September 2010. The growth, however, remained well below the average of 25 per cent registered during 2006-07 and 2007-08 (Chart 4.10).

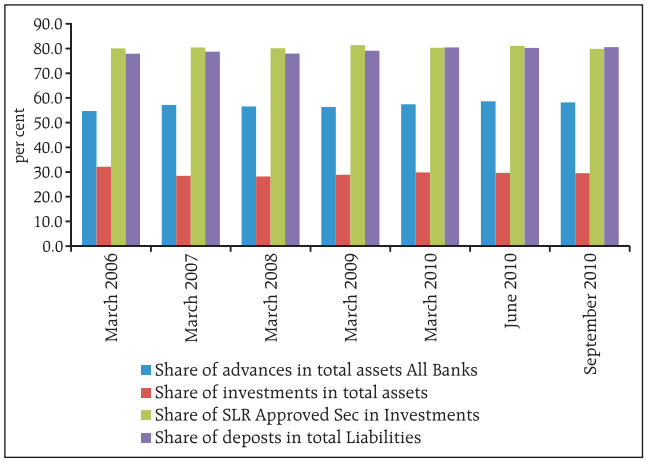
4.11 The ratio of credit to GDP continued to grow reflecting both the relatively robust GDP growth and greater financial inclusion in the country. However, the ratio remained much lower than that in many advanced economies (Chart 4.11). A recent BIS study found that in a sample of 27 financial crises between 1981 and 2003, 20 crises were preceded by a period in which credit to GDP ratio expanded strongly for a number of consecutive quarters. Further, there were 13 crises in

Chart 4.8: Growth of Assets to GDP Ratio of SCBs



Source: RBI Supervisory Returns; CSO

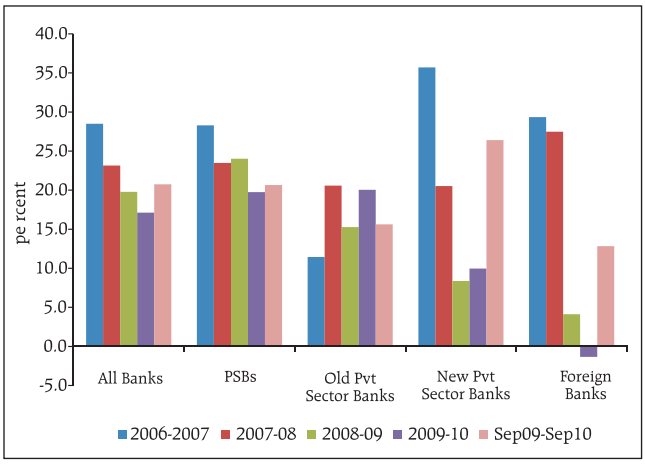
Chart 4.9 Share of Major Constituents in the Balance Sheet of SCBs



Source: RBI Supervisory Returns

the above sample which were preceded by period of credit booms[1]. It was also observed that 17 of the 20 crises that were preceded by an increase in credit to GDP ratio also saw a subsequent reduction in that ratio. As discussed in Chapter V of this Report, however, there are significant structural difficulties in using the credit to GDP ratio as an indicator of buildup of systemic risks in case of emerging economies such as India.

Chart 4.10: Growth in Advances of Bank Groups



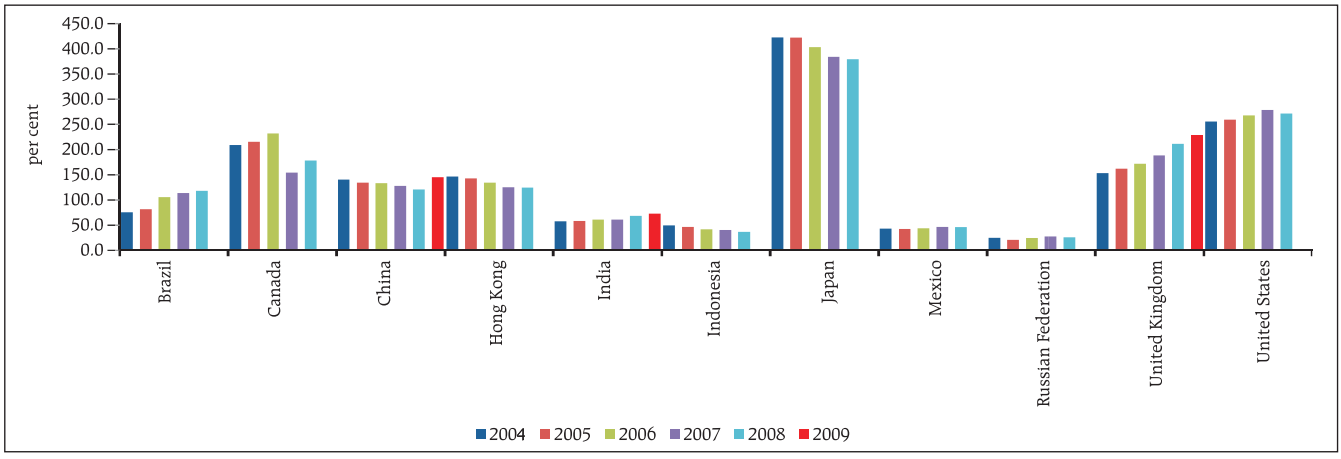
Source: RBI Supervisory Returns

Deposits

Growth remains subdued. However, share of low cost deposits has increased

4.12 As discussed in paragraph 4.9 above, deposits are the major source of funds for scheduled commercial banks in India. Deposits continued to grow during 2009-10 and by about 16 per cent on year on year basis as at end September 2010 indicating a distinct slowdown from the growth rates witnessed during the preceding years. However, the share of CASA (Current Account and Savings Account) deposits in total deposits grew from 34.06 per cent in March 2009 to 34.48 per cent in March 2010 and further to 35.08 per cent in September 2010 (Chart 4.12). There was, however, a simultaneous increase in banks' reliance on the 'Certificate of Deposits (CDs)[2]' to meet their funding needs (CDs

Chart 4.11: Credit to GDP Ratio of Select Economies during 2004-09



Source: World Bank Indicators 2010

[1] Mendoza and Terrones (2008) define a credit boom as a period in which the credit ratio exceeds its long-term trend by a certain threshold. According to the definition of credit boom by Borio and Drehman (2009), there were 17 financial crises in the sample of 27 crises which were preceded by period of credit booms.

[2] Certificates of Deposit (CDs) is a negotiable money market instrument issued by scheduled commercial banks and select all-India Financial Institutions (FIs). While there is no limit in case of banks as regards the amount of CD issue, the FIs have an umbrella limit fixed by RBI. Minimum amount of a CD is ₹ 1 lakh and in the multiples of ₹ 1 lakh thereafter. The maturity period of CDs issued by banks is not less than 7 days and not more than one year and in case of FIs it is not less than 1 year and not exceeding 3 years. Banks / FIs cannot grant loans against CDs. Furthermore, they cannot buy-back their own CDs before maturity.

increased by 1.7 times during 2009-10). Though the year on year increase slowed down to about 50 per cent in June 2010 and September 2010, the increase on an already high base of 2009 indicated that deposit growth was inadequate to fund credit growth. Increasing reliance on CDs could impact the cost of funds of banks, especially given the recent increase in CD rates as discussed in Chapter III of this Report.

Term deposits, the source for longer term credit has grown but majority of deposits were in short term

4.13 Terms deposits have also continued to grow facilitating funding of longer term credit. However, a study of the maturity profile of, *inter alia*, deposits indicates a preponderance of deposits in the shorter time bucket, which combined with growth in longer term assets (e.g. infrastructure lending), could exacerbate asset liability mismatches as discussed in paragraph 4.61 of this Chapter.

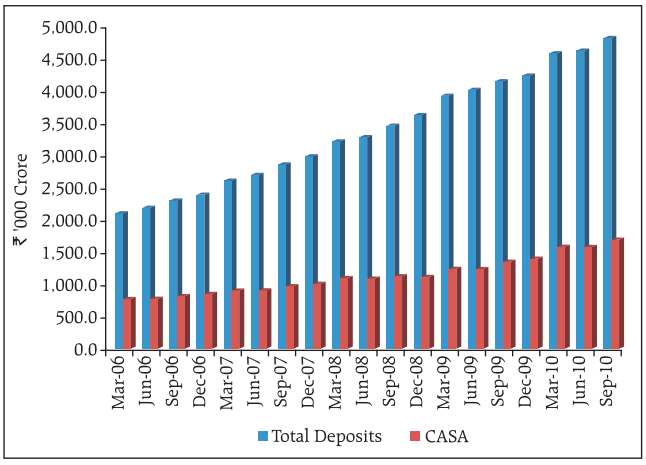
Credit to Deposit (CD) and investment to Deposit (ID) ratios

Sluggish deposit growth resulted in steep rise in incremental CD ratio

4.14 Credit to deposit (CD) (incremental) and Investment to Deposit (ID) (incremental) ratios measure the extent to which (incremental) credit and (incremental) investments are financed by (incremental) deposits. While the CD and ID ratios of the SCBs remained largely stable during 2009-10, there were large fluctuations in the incremental ratios during the same period (Table 4.1).

4.15 For the quarter ended June 2010, when the incremental CD ratio was a high 253 per cent, there were 24 banks with incremental CD ratio greater than 100 per

Chart 4.12: Deposits and Portion of CASA deposits of the SCBs



Source: RBI Supervisory Returns

Table 4.1: CD and ID Ratios of SCBs

	Mar-08	Jun-08	Sep-08	Dec-08	Mar-09	Jun-09	Sep-09	Dec-09	Mar-10	Jun-10	Sep-10
Percent Increase in Credit	9.7	2.3	7.7	2.6	5.9	-0.6	3.8	3.9	9.2	3.2	3.1
Percent Increase in Deposits	7.8	2.1	5.4	4.8	8.3	2.3	3.3	2.1	8.2	0.9	4.2
CD ratio	72.5	72.7	74.3	72.8	71.2	69.2	69.5	70.7	71.4	73.0	72.3
Incremental CD ratio	89.0	81.6	103.3	41.2	52.4	-17.8	80.2	127.1	79.8	253.6	54.5
Investment to Deposit ratio	36.2	36.4	33.3	37.1	36.5	39.0	39.1	39.0	37.1	36.9	36.7
Incremental ID ratio	21.6	48.6	-24.2	115.4	30.1	143.1	42.0	35.3	14.0	19.2	30.3

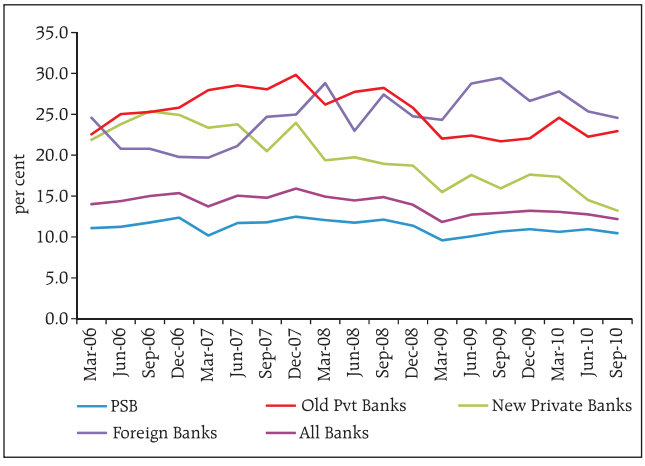
Source: RBI Supervisory Returns

cent. In the subsequent quarter, the incremental CD ratio came down to 54.4 per cent. The incremental credit during the quarter ended June 2010 was largely funded by way of increase in borrowings (13.44 per cent), reduction in the stock of investments, reduction in the dues from banks and utilising cash balances. The sharp increase in the incremental CD ratio during quarter ended June 2010 was influenced by few big banks which had funded their incremental advances through borrowings and retirement of their investments. The credit growth funded through such means cannot be sustained and may also impact margins if borrowings are contracted at interest rates higher than deposit rates.

Reliance on Bulk deposits was greater in case of old private and foreign banks

4.16 Old private sector banks and foreign banks continued to display a high degree of reliance on big ticket deposits (i.e. deposits of ₹ 15 lakh and above) though a sharp reduction in such reliance was evidenced in case of new private sector banks (Chart 4.13). Excessive reliance on bulk deposits could affect the profitability of banks, especially if they are contracted at higher than card rates. They could also engender liquidity risks arising out of sudden withdrawal and/ or non-rollover of such deposits.

Chart 4.13: Reliance on Big Ticket Deposits



Source: RBI Supervisory Returns

Leverage

Leverage[3] of global banks in advanced economies remains high

4.17 Excessive leverage of banks globally is widely believed to have contributed significantly to the global financial crisis. Though some lowering has taken place, the leverage continues to remain high relative to the leverage ratios of Indian banks.

[3] The leverage multiples in the charts 4.14 and 4.15 are balance sheet leverages (ratios of total assets to total equity of the banks adjusted by deducting intangible assets). The calculations are based on definitions of leverage ratio in the CGFS paper on 'The role of valuation and leverage in procyclicality' (April 2009) and an IMF policy paper on 'The Leverage Ratio' (December 2009). The IMF policy paper defines the term leverage ratio as the ratio of Tier I capital to total assets' whereas the inverse of the said ratio has been referred to as leverage multiple. The recent BCBS paper 'Basel III: A global regulatory framework for more resilient banks and banking system' (December 2010) has indicated the leverage as ratio of Tier-I Capital to Total assets, the numerator and denominator being adjusted in accordance with relative prescriptions given in the paper. Leverage ratio requirement is intended to achieve the objectives of constraining leverage in the banking sector, thus helping to mitigate the risk of build up and release of excessive leverage, a process which can damage the financial system and the economy, and to introduce additional safeguards against model risk and measurement error. This will reinforce the risk based capital requirements with a simple, non-risk based "backstop" measure. The Committee will test a minimum Tier 1 leverage ratio of 3 per cent during the parallel run period from 1 January 2013 to 1 January 2017. Based on the results of the parallel run period, any final adjustments to the definition and calibration of the leverage ratio will be carried out in the first half of 2017, with a view to migrating to a Pillar 1 treatment on 1 January 2018.

Chart 4.14: Balance Sheet Leverage Multiples of Select US Banks

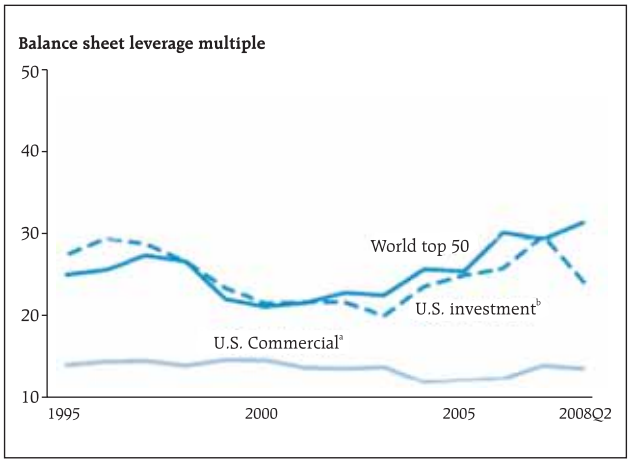
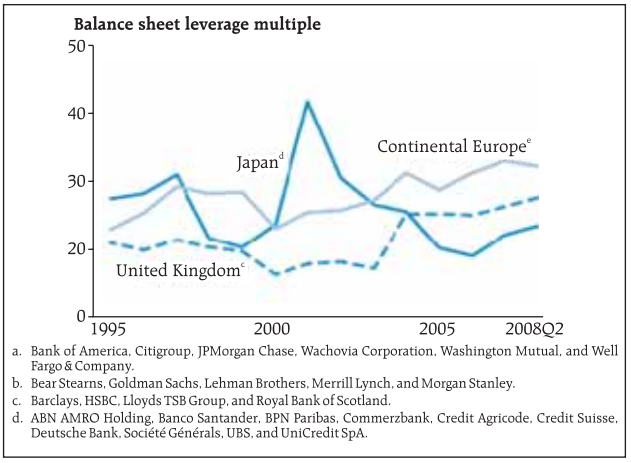


Chart 4.15: Balance Sheet Leverage Multiples of Select Banks of Europe and Japan



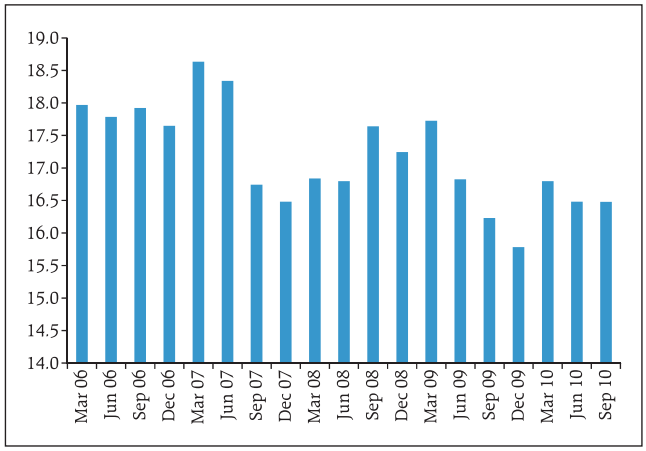
a. Bank of America, Citigroup, JPMorgan Chase, Wachovia Corporation, Washington Mutual, and Well Fargo & Company.
b. Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch, and Morgan Stanley.
c. Barclays, HSBC, Lloyds TSB Group, and Royal Bank of Scotland.
d. ABN AMRO Holding, Banco Santander, BPN Paribas, Commerzbank, Credit Agricode, Credit Suisse, Deutsche Bank, Société Générals, UBS, and UniCredit SpA.

Source: CGFS 2009

Indian banks continue to be moderately leveraged[4]

4.18 The leverage multiples of the US, European and Japanese banks was around 30 for the world's top 50 banks in 2007 (Chart 4.14 and 4.15). In contrast, the leverage multiple of SCBs in India remained moderate (Chart 4.16). The multiple for banks in India declined marginally during 2009-10 (from 17.75 to 16.83). The level of leverage of Indian banks also reflected comfortable Tier-I capital position, modest growth in overall banking assets and recapitalisation of few Public Sector Banks (PSBs) that was done during 2009-10. Global initiatives towards introduction of a leverage ratio for banks is thus not expected to be a binding constraint though there are some definitional concerns in this connection as has been discussed in Chapter V of this Report.

Chart 4.16: Leverage Multiples of SCBs



Source: RBI Supervisory Returns

Exposure to highly leveraged corporates remained moderate

4.19 While the leverage of the banks themselves is an important risk indicator, their exposure to the highly leveraged companies is of equal concern. A study in this regard has shown that the Indian Banks have moderate level of exposures in companies which were highly leveraged. The growth in the exposure to such companies was however coming down (Box 4.1).

[4] Leverage multiples of Indian banks are balance sheet leverages (ratios of total assets to total equity of the banks adjusted by deducting intangible assets) calculated using a similar methodology to that used by CGFS and IMF as described in footnote 3.

Box 4.1: Indian Banks' Exposure to Highly Leveraged Companies

A very high level of leverage in the balance sheets of companies entails higher probability of distress and possibility of even failures. In order to assess the vulnerabilities added to the system as a result of banks' exposures to such companies, a study in this regard was conducted by the Reserve Bank. The study took a sample of the 25 most leveraged companies (excluding banks) in India. Of these 25 companies, 20 companies were top BSE 100 companies in terms of their Debt Equity Ratio (DER) and the remaining 5 companies (though not part of BSE 100) were selected on the basis of a combined high DER and net worth of more than ₹ 1500 crore.

The study has observed the following:

(i) As per the list of BSE 100 companies, the highest DER was 245.1 per cent and only eight companies had DER above 100 per cent.

(ii) Among the non-BSE 100 companies in the sample, the DE ratio ranged between 117.7 per cent and 507.4 per cent.

(iii) Traditionally, the highly leveraged industries in India are manmade textiles, cotton textiles, sugar, paper and paper products, plastic products, iron and steel, fabricated metal products, chemical, hotels and restaurants and real estate. In the aforesaid sample, the manmade textile industry had the highest leverage with a DER of about 200 per cent, closely followed by the cotton textile industry. Five companies in the selection had a DER in excess of 200 per cent. Of these, two companies were from the iron and steel sector.

(iv) Fund based exposure constituted 64 per cent of the total exposure to these 25 companies in September 2010. Total exposure to these companies in September 2010 grew by about one per cent over March 2010, whereas the y-o-y growth between March 2009 and 2010 was 18 per cent. Public Sector Banks accounted for 68 per cent of the total banks' exposure in March 2009 which increased to 73 per cent in March 2010 but came down to 69 per cent in September 2010. New Private sector banks had a share of 20 per cent exposure in September 2010.

(v) Further, five banks alone accounted for about 53 per cent of the total exposure towards these 25 companies, which included three PSBs and two new private sector banks. There were 24 banks which had exposure in excess of ₹ 2000 crore.

(vi) At the system level, exposure in these 25 companies was about 6 per cent of the gross advances of the SCBs. There was one foreign bank which had 17 per cent of its gross advances exposure in 10 out of the 25 companies.

(vii) About 36 per cent of this exposure was to the iron and steel sector.

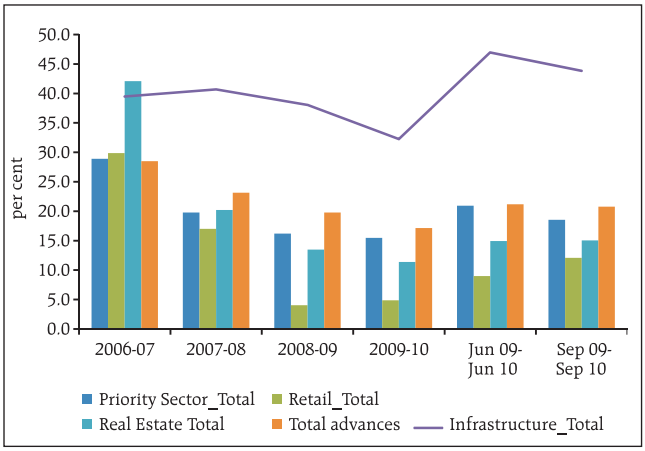
(viii) One airline company had a DER of more than 500 per cent, which was much above the industry average.

Sectoral Credit Analysis

Real estate and Infrastructure loans have driven the credit growth

4.20 Credit growth during 2008-09 and 2009-10 was sluggish. Advances picked up as at end September 2010 as credit off take improved to 20.7 per cent on a year on year basis (Chart 4.17). The recovery was observed to be primarily on account of incremental advances to infrastructure, real estate, retail and priority sectors.

Chart 4.17: Growth of Sectoral Credit of SCBs



Source: RBI Supervisory Returns

Retail Credit

Growth remains moderate but incremental rise in impairment in housing loans was discernible

4.21 The share of retail credit in the total advances of scheduled commercial banks was 19 per cent. Its share had significantly reduced from the pre-crisis level of 26 per cent. Growth rate in the sector showed recovery

as at end September 2010 as it registered increase of 12.07 per cent on year on year basis as against average growth of 4.5 per cent in 2008-09 and 2009-10.

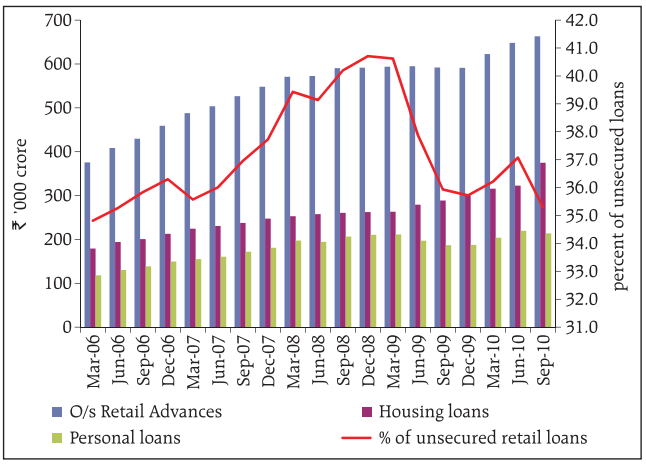
Housing loans and personal loans were the key contributors to the growth of retail loans

4.22 Housing loans are a major component of retail credit in India and were one of the prime drivers in the growth of the retail loan portfolio of SCBs, especially during the last year and a half (Charts 4.18 and 4.19). Such loans accounted for over 56 per cent of total retail credit as at end September 2010 – a little above their share in March 2010 which was 54.3 per cent. As a proportion of the aggregate advances of SCBs, housing loans have averaged above 10 per cent over the last few years (Chart 4.20).

Rebound in the growth of housing loans led to tightening of prudential norms

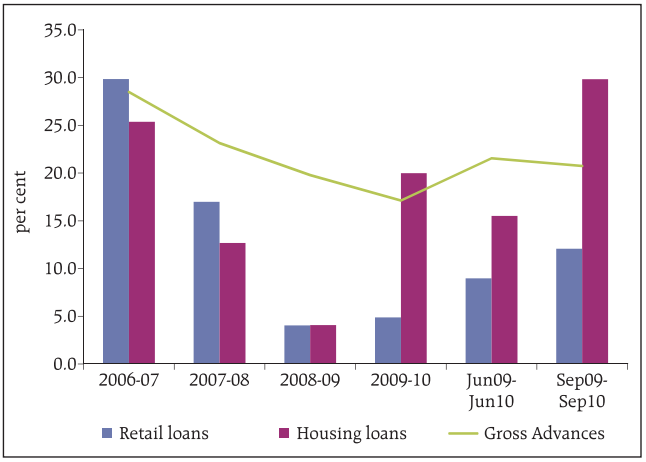
4.23 Growth in the housing loan portfolio of banks recovered sharply during 2009-10 after the slowdown experienced during the previous two years in the aftermath of the financial crisis. The portfolio grew by about 20 per cent during 2009-10 and by about 30 per cent as at end September 2010 on a year on year basis as compared to 13 per cent during 2007-08 and 4 per cent during 2008-09. There was concomitant increase seen in the housing prices during 2009-10 and thereafter resulting in prices at many centres surpassing their pre-crisis levels. Alluring schemes for housing loans offered by the banks could also be adding to demand pressures and housing prices. In response to these developments, and as a precautionary measure to curb any build up of excessive risks in this sector, the Reserve Bank announced a series of measures in the Second Quarter Review of Monetary Policy in November 2010. These include, *inter alia*, restriction of Loan to Value ratio of housing loans to 80 per cent (90 per cent for loans up to ₹ 20.00 lakh) and increase in the risk weights on large housing loans (₹ 75 lakh and above) to 125 per cent in order to prevent excessive leveraging. The previous FSR had pointed out some concerns with respect to the growing incidence of home loans with "teaser rates" – home loans with an initially low fixed interest rate, which in later years increases to higher levels. This practice raises concern as some borrowers may find it

Chart 4.18: Housing and Personal Loans and Level of Unsecured Credit of SCBs



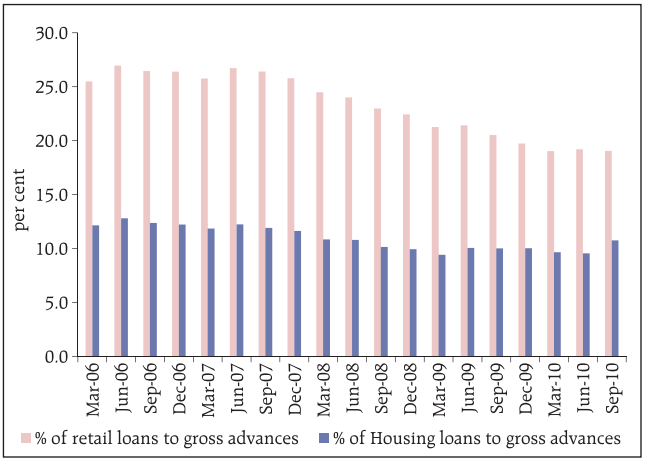
Source: RBI Supervisory Returns

Chart 4.19: Growth of Retail and Housing Credit of SCBs



Source: RBI Supervisory Returns

Chart 4.20: Share of Retail and Housing Credit of SCBs in their Total Advances



Source: RBI Supervisory Returns

difficult to service the loans once the normal interest rate, which is higher than the rate applicable in the initial years, becomes effective. It has been also observed that many banks at the time of initial loan appraisal, do not take into account the repaying capacity of the borrower at normal lending rates. Therefore, in view of the higher risk associated with such loans, the standard asset provisioning on the outstanding amount has now been increased from 0.40 per cent to 2.00 per cent. However, the provisioning on these assets would revert to 0.40 per cent after 1 year from the date on which the rates are reset at higher rates if the accounts remain 'standard'.

Significant portion of the retail loans was unsecured

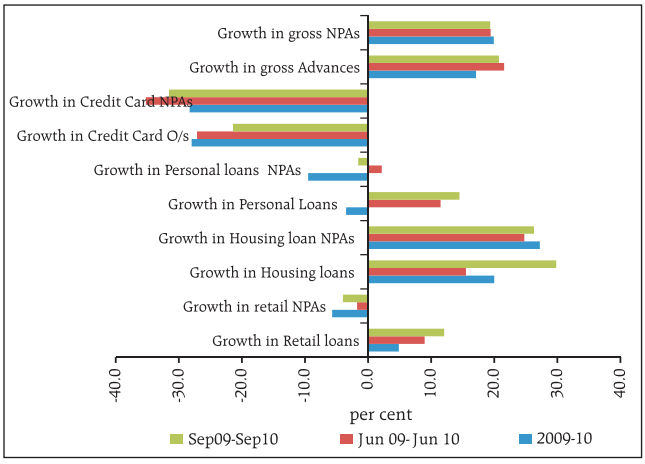
4.24 The share of unsecured credit (primarily personal loans) - the other major component of retail credit in the retail loan portfolio of the commercial banks - remains high at about 35 per cent. Personal loans which had a negative growth of 3.48 per cent during 2009-10, increased by 14.49 per cent in September 2010 on a year on year basis. NPAs in personal loans accounted for 40 per cent of the retail loan NPAs. However, the NPAs in personal loans declined on year-on-year basis as at end-September 2010.

Increase in retail sector delinquency has slowed down, but in case of housing loans it could cause some concern

4.25 Delinquencies in the retail sector, which had increased sharply in the wake of the slowdown and aggressive lending earlier in the boom years, showed an improving trend during 2009-10 and in the subsequent quarters (Chart: 4.21). Despite the decline in the rate of delinquencies, the ratio of the NPAs in the retail portfolio to total retail advances remained high at 3.74 per cent in September 2010. The NPAs in the housing segment grew sharply during 2009-10 (27.22 per cent) and continued to register significant increase as at end September 2010 on a year on year basis (26.31 per cent). Housing loan and personal loan NPAs held the key to the level of NPAs in retail sector as also overall gross NPAs inasmuch as these constituted about 73 per cent of the retail NPAs during March 2005 - September 2010 and 21.5 percent of the overall gross NPAs of the SCBs during the same period.

4.26 The sharp increase in retail NPAs during 2007-08 and 2008-09 was, at least, partially, a result of adverse

Chart 4.21: NPAs Growth of SCBs in Retail Sector



Source: RBI Supervisory Returns

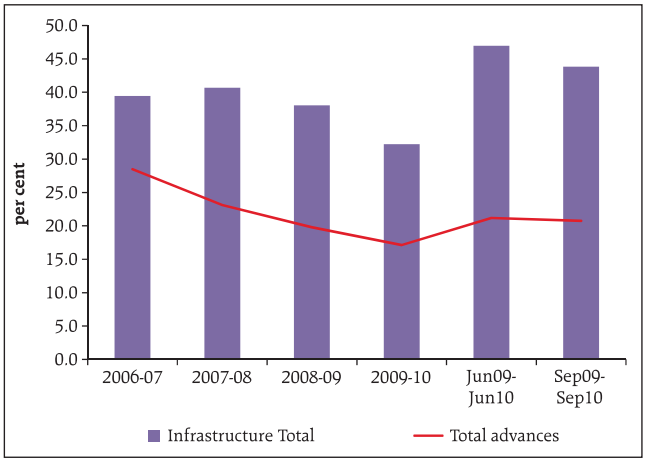
credit selection during the expansionary phase of the economy. As the economy recovers and regains the higher growth trajectory achieved before the crisis, banks will need to guard against any dilution in their credit appraisal standards.

Infrastructure

Banks' finance has increased substantially to this preferred sector but it has also added to asset liability mismatches in the long term

4.27 Advances to infrastructure continued to exhibit strong growth – above 30 per cent for 2009-10 and above 40 per cent as at end September 2010 on a year on year basis (Chart 4.22). The growth rate of infrastructure advances remained well above the growth rate of aggregate advances and hence, the share of infrastructure lending in total advances increased to 12.4 per cent in September 2010 from 6.2 per cent in March 2005 and 10.4 per cent in March 2010. The bulk of the exposure in infrastructure was concentrated in PSBs which accounted for nearly 88 per cent of the outstanding amount of infrastructure advances of SCBs. There has been a sharp increase in the absolute levels of NPAs in the sector (from ₹ 1442 crore to ₹ 2725 crore between September 2009 and September 2010) though the NPA ratio remains below one per cent of infrastructure advances.

Chart 4.22: Growth of Infrastructure Advances by SCBs



Source: RBI Supervisory Returns

Infrastructure finance is the need of the hour but could cause ALM concerns for the banks

4.28 The increasing exposure of the banking sector to infrastructural lending was, at least in part, a reflection of the acute need for improving the country's infrastructure. Nonetheless, the growing exposure to the infrastructure sector may pose some concerns for the banking sector as the portfolio grows despite mitigating factors like high level of CASA deposits and interest rate reset clauses stipulated by banks. The other vulnerability is banks' inability to price the loans on fixed term basis over the long horizon of infrastructure projects which increases the credit risk. The asset liability management issues associated with infrastructure lending could also potentially get exacerbated given the not insignificant probability of projects getting delayed in view of various socio-political and legal-administrative bottlenecks including environmental issues that these projects encounter.

Further regulatory relaxations may not be easy

4.29 The relaxations in exposure norms (5 per cent in the case of single borrower limit and 10 per cent in case of group exposure limit) continue to be operative for facilitating lending to the sector. There have been representations to the Reserve Bank from various quarters to further relax the exposure norms in regard to infrastructure loans. However, given the regulatory aim to minimise the buildup of excessive concentration risks and the fact that infrastructure financing adds to asset liability mismatches, any further relaxation in the exposure norms may not be warranted. In fact, the current exposure norms for infrastructure financing in India are way above the international norms.

Financing infrastructure requires finding a sustained solution

4.30 Financing infrastructure will thus require finding a sustained solution in the form of developing markets for long term funding. The previous FSR had outlined the various measures taken by the Government and by the Reserve Bank to facilitate lending to the infrastructure sector. A few additional measures taken in this direction include take-out financing arrangements with Infrastructure Development Finance Company (IDFC) as also other Financial Institutions, and External Commercial Borrowings (ECBs) under the approval route for the purpose of refinancing rupee loans for certain categories of infrastructure projects subject to certain limitations. Also, the proposed take out financing of about ₹ 25,000 crore by the India Infrastructure Finance Company Limited (IIFCL) over the next three years, as announced in Union Budget 2010-11, could provide some room to banks in addressing their ALM issue. IIFCL has also been authorised to refinance bank lending to infrastructure projects. Further, setting up of infrastructure debt funds on the lines of venture capital funds has been proposed by the government for raising low-cost long term funds for infrastructure (public private partnership) projects which are past the construction stage and in case of which a public authority has given compulsory buy-out guarantee. Several steps have also been taken to facilitate the development of the corporate bond market as have been discussed in Chapter III of this report. Apart from the measures to facilitate funding, the asset classification norms for the sector have been partially modified to allow commencement of commercial operations to be extended by a maximum of four years from their original dates in case of restructured project loans involving delays due to court cases, without requiring the asset classification of the project to be downgraded. The provisioning requirements in case of un-secured exposures of infrastructure advances, categorised as substandard, have been reduced to 15 per cent (as against 20 per cent for other exposures) provided there is a mechanism to escrow the cash flows from the project and the bank has a clear and legal first claim on these cash flows.

Real Estate

Revival of bank finance to real estate was seen amidst rising property prices

4.31 The real estate exposures of SCBs – both residential mortgages and commercial real estate - has been gathering momentum in recent quarters and account for about 18 per cent of total advances. The year on year growth rate in the real estate exposure revived as at end September 2010 to 18 per cent, after a slowdown in the aftermath of the crisis (Chart 4.23).

4.32 Exposure to commercial real estate (CRE) comprises about 25 per cent of total real estate exposure in September 2010. The share of this segment in real estate exposure has increased sharply in recent quarters (from 16.40 per cent in March 2009) primarily due to a change in definition of commercial real estate[5] . Trends in housing credit (which comprises about 61 per cent

[5] Circular DBOD.BP.BC.No.42/08.12.015/2009-10 dated September 9, 2009 on Guidelines on Classification of Exposures as Commercial Real Estate Exposures (CRE) has essentially adopted the Basel-II norms in this regard. For an exposure to be classified as CRE, the essential feature would be that the funding will result in the creation / acquisition of real estate (such as, office buildings to let, retail space, multifamily residential buildings, industrial or warehouse space, and hotels) where the prospects for repayment would depend primarily on the cash flows generated by the asset. Additionally, the prospect of recovery in the event of default would also depend primarily on the cash flows generated from such funded asset which is taken as security. Exposures to entrepreneurs for acquiring real estate for the purpose of their carrying on business activities, which would be serviced out of the cash flows generated by those business activities will not be classified as commercial real estate. However, the exposures to be repaid out of the rentals generated by these properties may be classified as CRE because even though such exposures do not result in funding / acquisition of commercial real estate, the repayment might be sensitive to fall in real estate rentals and as such generally such exposures should be classified as CRE.

of total real estate exposure of SCBs) have been discussed in paragraphs 4.22 and 4.23 of this Chapter.

Increasing trend in the NPAs was being noticed due to increase in impairment in housing loans

4.33 The real estate NPAs showed increase of 8 per cent during the quarter ended September 2010. However, the share of real estate NPAs in SCBs' total NPAs marginally declined from 13.58 per cent in March 2010 to 13.13 per cent in September 2010. The gross NPA ratio for the real estate sector stood at 1.90 per cent as against overall gross NPA ratio at 2.58 per cent as at end September 2010 (Chart 4.24).

4.34 As against their share of about 60 per cent in the total real estate loans, the residential mortgage NPAs contributed nearly 80 per cent of real estate NPAs as at end September 2010. NPAs in residential mortgages increased on a year on year basis as at end September 2010 (as discussed in paragraph 4.25 of this Chapter). However, the gross NPA ratio remained unchanged at about 2.5 per cent. The increase in the absolute levels of NPAs in the residential mortgage loans were largely a result of adverse credit selection during periods of aggressive lending prior to the crisis. The banks have, off late, taken steps to strengthen the credit sanction mechanism in this area as also their monitoring by undertaking centralised processing of loan applications. With improved IT enabled financial tools, the banks have also been able to monitor the loan accounts more effectively.

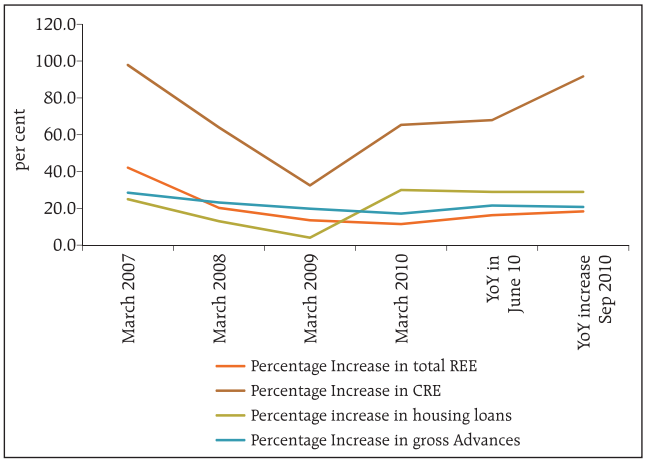
4.35 The NPAs in case of CRE advances declined marginally during the half year ended September 2010. The gross NPAs ratio in CRE declined from 1.66 per cent in March 2010 to 1.46 per cent in September 2010. However, there were some instances of slippages of large commercial real estate accounts, including restructured accounts[6].

Exposure to NBFCs

Exposure has grown but remained small

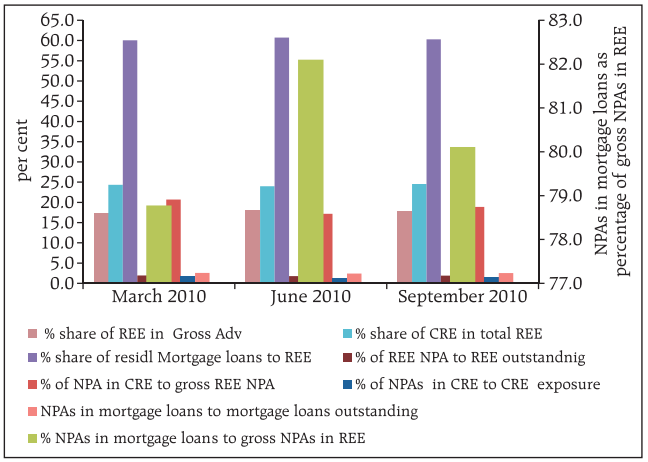
4.36 Exposures to NBFCs continued to grow during 2009-10 and in the subsequent quarters (Chart 4.25) though overall exposures to the sector was less than 4 per cent of aggregate advances of the SCBs. Impaired

Chart 4.23: Growth in Components of Real Estate Loans by SCBs



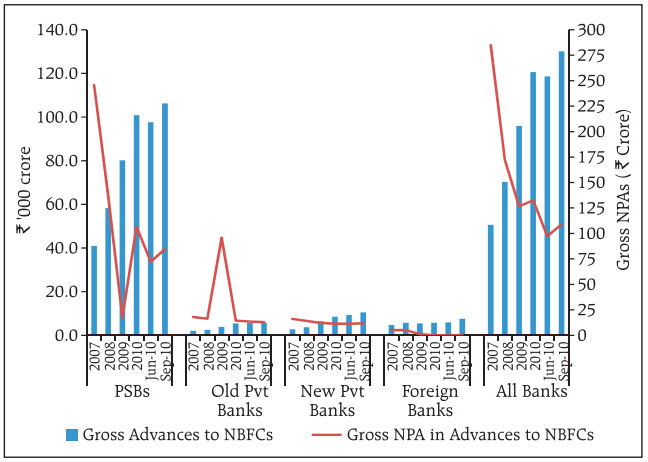
Source: RBI Supervisory Returns

Chart 4.24: Share of NPAs in Real Estate Loans by SCBs



Source: RBI Supervisory Returns

Chart 4.25: Exposure to NBFCs



Source: RBI Supervisory Returns

[6] In view of the probability of slippage of restructured real estate accounts, the Reserve Bank undertook a study in this respect based on a sample of six commercial banks. The study revealed that, in the above sample, 19 per cent of real estate accounts restructured in 2008-09 and 9 per cent of accounts restructured in 2009-10 slipped into NPAs.

assets in this sector were also low at less than 1 per cent of relative exposures.

Securitisation

Volumes suffered a decline in 2009-10

4.37 Securitisation volumes in India declined in 2009-10 for the second year in a row with issuance volumes declining by nearly 22 per cent. The dip in the overall securitisation volumes was largely a result of the 60 per cent reduction in single corporate loan securitisations or Loan Sell-Offs (LSO), which were mostly short-term in nature. The causative factors included market volatility, tight liquidity, redemption pressures faced by mutual funds (mutual funds are key investors, particularly in LSO segment) on the back of proposed regulatory changes on minimum holding period and minimum retention requirement in case of the securitisation deals, etc.

4.38 Globally, the securitisation markets had come to a virtual standstill in the wake of the financial crisis. However, in view of the essential risk dispersal qualities of securitisation and the fact that it also ameliorates liquidity issues for genuine credit expansion, internationally there are efforts on going to revive the securitisation markets (Box 4.2).

Box 4.2: Reviving Securitisation Markets

Securitisation was considered to be one of the primary causative factors leading to the global financial crisis. In the aftermath of the crisis, securitisation instruments have been viewed with suspicion and the market for securitisation has virtually frozen. However, it was also realised that as a product, securitisation is essentially a superior risk management tool and that its misuse was a result of failure in framing appropriate regulation and in permitting the market to grow unfettered. Consequently, a number of initiatives are being taken internationally to revive the securitisation markets on a sounder footing.

In this regard, BCBS has proposed reforms aimed at realigning regulatory capital requirements for securitisation products. The Pillar I reforms have multiple goals and aim to better reflect the risks involved by way of increasing the risk weights attached to these exposures and to eliminate the opportunities for regulatory arbitrage. The BCBS has also carried out revisions to Pillar 3 requirements with a view to enhance market discipline across all aspects of securitisation.

With a view to reducing reliance on rating agencies, a series of policy initiatives have been undertaken to encourage the agencies to tighten their internal governance and improve their transparency and disclosure standards. European regulations now require rating agencies to differentiate their securitisation product ratings from those on regular corporate and sovereign debt. The U.S. Treasury has also advocated differential rating scales in its *Financial Regulatory Reform* white paper released in August 2009. Further requirements have also been introduced regarding the publication of rating performance metrics to facilitate cross-product and cross-rating comparisons. Improving disclosure standards and making publicly available detailed information about the assets underlying the structured finance products, could also help reduce rating shopping by making it possible for entities other than the credit rating agency hired by the originator to develop and disseminate opinions about the securities. The International Organisation of Securities Commission (IOSCO) has published disclosure principles for Asset Backed Securities (ABS) for regulatory regimes outlining the information which should be included in any offer document of ABS, including residential and commercial mortgage-backed securities.

Compensation systems based on immediately measurable accounting results also played a role in creating the conditions that led to the crisis. Accounting standards that eliminate the upfront recognition of income from securitisations—and thereby the immediate impact on compensation could significantly alter compensation schemes. Introducing a longer-term perspective on structuring securitisations should force originators to better account for the risk-return trade-off of the instrument and provide incentives for better underwriting standards. A welcome development in this regard is the FASB's elimination of the gain on sale accounting treatment that had added to the profitability of certain securitisations.

Another set of initiatives are aimed at product standardisation and simplification which would increase transparency and facilitate better understanding of risks thus contributing to the development of a liquid secondary market.

Again, a set of recent policy moves attempt to get more securitiser "skin in the game" to ensure that someone is taking responsibility for diligent loan underwriting and monitoring. It is clear that, in many cases, securitisation product issuers were poorly incentivised to conduct the appropriate (continuous) due diligence on loan originators. In order to incentivise stronger issuer due diligence effort, the European and U.S. authorities are proposing to amend securitisation-related regulations to incentivise issuers to retain an economic interest in the securitisation products they issue. The European Union (EU) Parliament has amended the Capital Requirements Directive, which sets out the rules for Basel II implementation in Europe, to provide incentives for securitisers to retain at least 5 per cent of the nominal value of originations. In a June 17, 2009 white paper, the U.S. government called for similar risk retention requirements for U.S. securitisers. Both propose several risk retention options, including retaining the equity tranche and equal amounts of all tranches ("vertical" slices).

Off balance sheet (OBS) exposure

OBS exposure are mostly in traditional instruments. A sharp increase was noticed in case of foreign banks.

4.39 The total OBS exposures of the SCBs as a percentage of total balance sheet size had declined 218 per cent to 178 per cent during 2009-10 but showed moderate increase in the half year ended September 2010 (Chart 4.26) rising to 210.8 per cent as at end-September, 2010. Overall exposure for SCBs was not indicative of being excessive. However, the ratio of OBS exposures to balance sheet size of foreign banks increased from 1555 per cent as at end March 2010 to 1828 per cent as at end September 2010.

4.40 Further, banks in India, especially domestic banks, have been holding mostly traditional off balance sheet items like credit contingents (financial and performance guarantees, acceptances, endorsements etc.) and forward foreign exchange contracts (Chart 4.27).

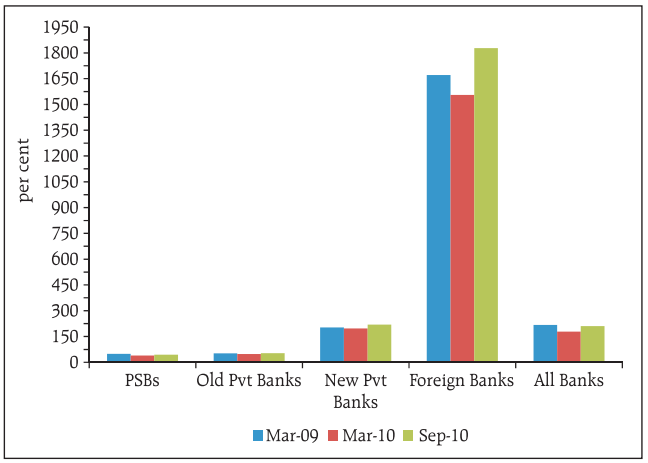
4.41 As reported in the previous FSR, the approach to introduction of derivative products in the Indian financial markets has been cautious. Nevertheless, the menu of available derivative products has been expanded in a calibrated manner and banks in India are increasingly using these products to manage risks as also offering the same to their corporate clients.

4.42 Foreign banks continued to account for the bulk of OBS exposures, especially derivative related exposures (Chart 4.28).

Credit Equivalent of the OBS exposure was not significant

4.43 Credit equivalent of the off balance sheet exposure, which is the potential balance sheet exposure based on which the capital requirements are estimated, as a ratio of balance sheet size remained low and, in fact, exhibited a declining trend (from 8.8 per cent in March 2009 to 5.3 per cent in March 2010 and further to 4.8 per cent in the half year September 2010)

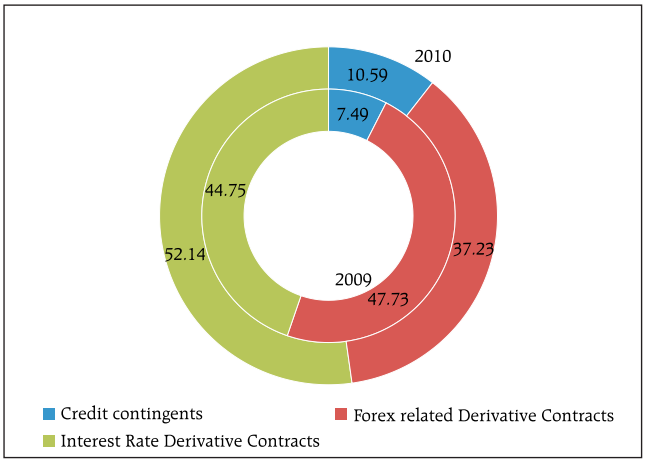
Chart 4.26: Off Balance Sheet Exposure as Percentage of the On Balance Sheet Assets



Source: RBI Supervisory Returns

Chart 4.27: Composition of OBS Exposures

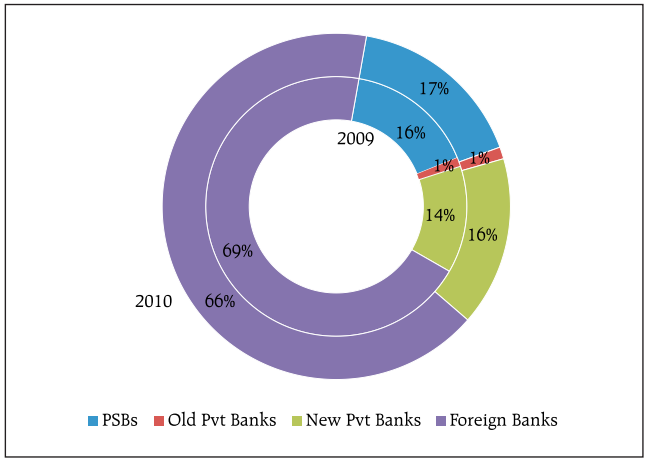
(per cent)



Source: RBI Supervisory Returns

Chart 4.28: Concentration of OBS Exposure among the Bank Groups

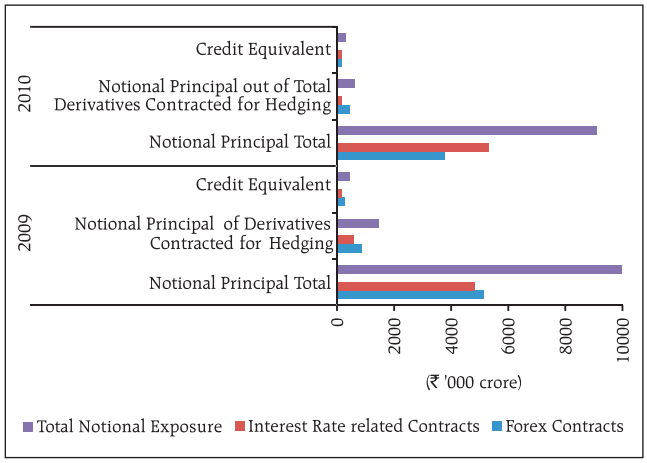
(per cent)



Source: RBI Supervisory Returns

(Chart 4.29). The ratio in case of foreign banks was typically high at 51 per cent in March 2010 but declined to 45.46 per cent in September 2010. The aggregate MTM positions of the SCBs remained positive.

Chart 4.29: Off Balance Sheet Exposure-Notional and Credit Equivalents



Source: RBI Supervisory Returns

Financial Soundness Indicators

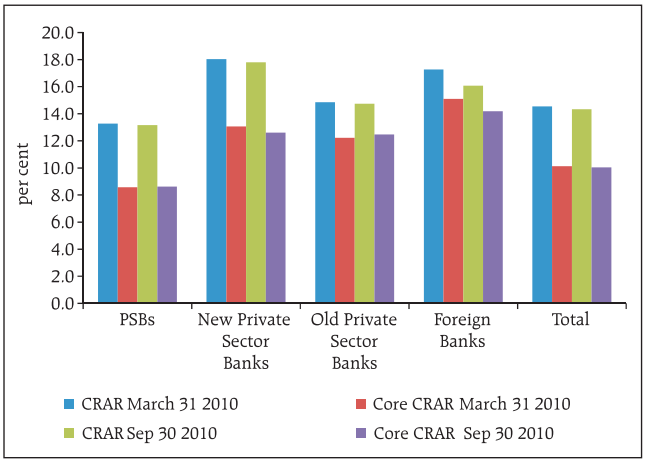
Capital to risk weighted assets ratio (CRAR)

Indian banks remain well capitalised. No bank had CRAR less than stipulated minimum.

4.44 SCBs with overseas presence migrated to the Basel II framework with effect from March 31, 2008 while other commercial banks (except RRBs) migrated to the new framework with effect from March 31, 2009. The time schedule for implementation of advanced approaches under Basel II has also been notified though there remain several challenges (with respect to creating requisite IT and risk management infrastructure, upgrading skills and building requisite historical data) in migrating to these approaches.

4.45 SCBs in India are required to maintain capital to the extent of 9 per cent of risk weighted assets (as against the Basel II requirement of 8 per cent). With effect from April 1, 2010, they are also required to maintain a core CRAR (Tier I capital to total risk weighted assets) of 6 per cent (as against the Basel II requirement of 4 per cent). The capital adequacy position of SCBs was well above the regulatory requirements with CRAR and core CRAR being in excess of 14 per cent and 10 per cent respectively in March 2010 and in September 2010. The ratios declined marginally in September 2010 due to greater credit off take (Chart 4.30).

Chart 4.30: Capital Adequacy under New Capital Adequacy Framework



Source: RBI Supervisory Returns

4.46 There was no commercial bank which had CRAR less than 11 per cent or core CRAR less than 6 per cent as on September 30, 2010 indicating that the capital adequacy position of banks was comfortable both at the micro and the macro level.

4.47 As an additional safeguard, domestic regulations required SCBs to compute their respective capital adequacy ratios under Basel I guidelines in addition to computing the same under Basel II guidelines in order to ensure that the capital maintained in respect of credit and market risks by

SCBs is not less than 80 per cent of the capital requirements under Basel I. The capital adequacy ratios under Basel I guidelines, though a tad lower than the ones under Basel II guidelines[7] were also well above the minimum prescribed (Chart 4.31).

4.48 The comfortable capital adequacy position of banks in India implies that the distance to comply with the requirements under Basel III[8] may not be very significant at the system level though there are some concerns /challenges as have been discussed in Chapter V of this Report.

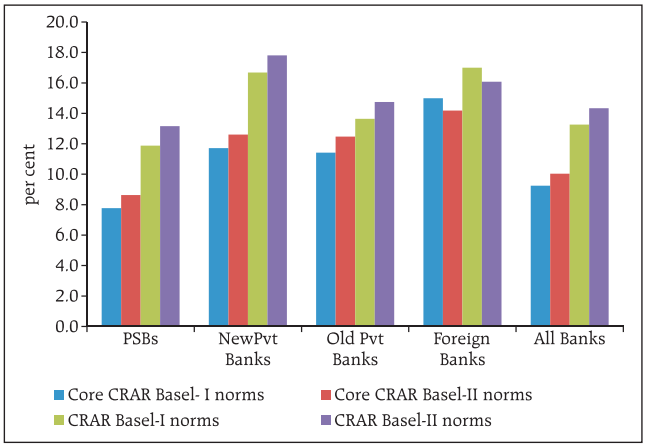
Overall Asset Quality

Asset quality continued to deteriorate in the aftermath of the global financial crisis

4.49 During 2009-10, growth in the stock of NPAs was 20.61 per cent which outpaced the rate of growth of gross advances at 16.68 per cent. Consequently, the gross and net ratio of NPAs to gross and net advances deteriorated during 2009-10. The deterioration in the asset quality continued as at end September 2010, as the gross NPAs increased by about 19.34 per cent on year on year basis (Chart 4.32). The gross NPA ratio at 2.39 per cent as at end March 2010 increased to 2.58 per cent as at end September 2010. However, the net NPA ratio improved (from 1.12 per cent to 1.06 per cent) as banks increased their provisions in a bid to meet the regulatory requirement of 70 per cent provision coverage ratio (Chart 4.33).

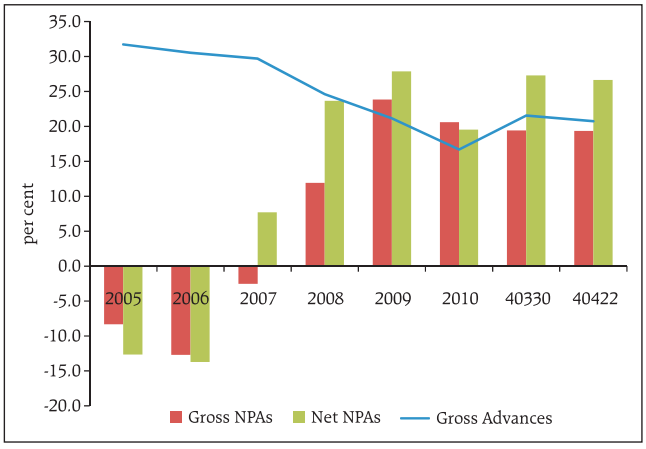
4.50 The rate of increase in NPAs remained high in spite of large quantum of accounts written off or recovered under the one time compromise settlement schemes of individual banks (Chart 4.34). The increase in NPAs may have been greater but for the onetime special dispensation in restructuring norms permitted by the Reserve Bank in case of entities temporarily affected by the impact of the financial crisis. The

Chart 4.31: Capital Adequacy under Basel-I and Basel-II Frameworks (September 2010)



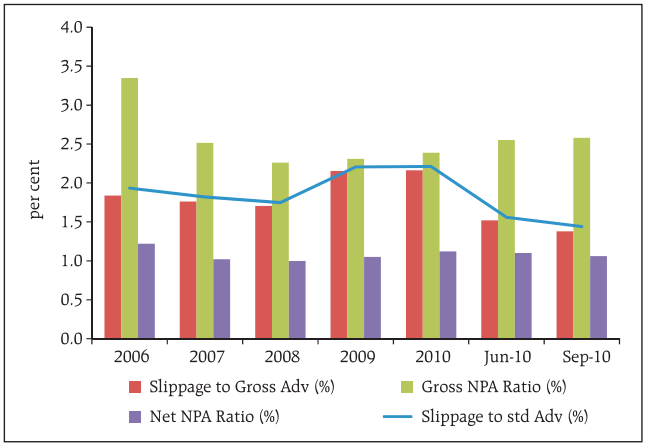
Source: RBI Supervisory Returns

Chart 4.32: Growth Rates of Gross NPAs of SCBs



Source: RBI Supervisory Returns

Chart 4.33: NPA Ratios and Fresh Slippage Ratios of SCBs



Source: RBI Supervisory Returns

[7] CRAR and core CRAR for all SCBs are higher under Basel II guidelines as compared to under the Basel I guidelines by 78 and 74 basis points respectively. This is due to, *inter alia*, the benefits available in respect of reduced risk weights for highly rated accounts, reduced risk weights in exposures to regulatory retail and residential housing loans to individuals.

[8] A set of global reforms to the regulatory framework for banks aimed at, *inter alia*, increasing the quality and quantity of capital and improving its risk coverage so as to better address both firm specific and systemic risks.

slippage ratio[9] as at end September 2010 over March 2010 remained high at 1.42 per cent (annualised) though it marked an improvement over the ratio for 2009-10 at 2.21 per cent.

NPAs concentrated in few big accounts require focused recovery efforts

4.51 Significant concentration of NPAs in a few accounts persisted with the top 30 impaired assets of the SCBs accounting for 30 per cent of the gross NPAs. These could potentially increase the provision requirements of the banking sector substantially if the asset quality of one or more of these large accounts does not improve.

Older NPA accounts, comprised about half of the gross NPAs

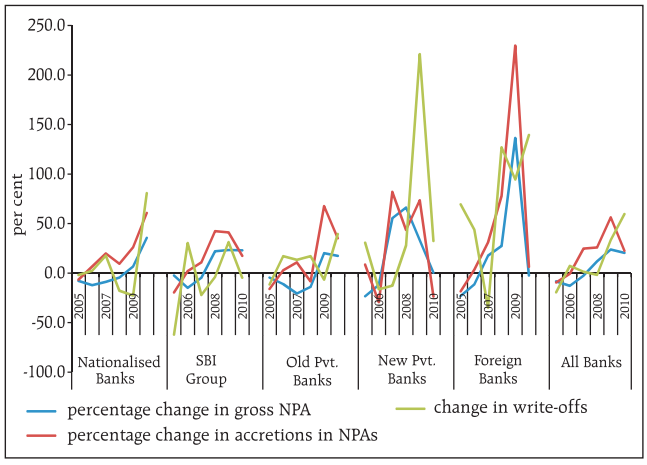
4.52 Doubtful and loss assets comprised over 50 per cent of the stock of NPAs of SCBs indicating the preponderance of such advances (Chart 4.35). Coupled with the fact that accretion to NPAs remained elevated, the quality of assets of the banking sector continued to cause some concern.

Emerging developments in the telecom and real estate sectors may impact lending to and asset quality of these sectors

4.53 In a recent report by the Comptroller and Auditor General of India, it was brought out that irregularities in the allotment of 2G spectrum licenses below market rates had resulted in significant loss of revenue to the exchequer. In case the resultant government action results in the cancellation of licenses issued to telecom companies, there may be an impact on the repayment of dues to banks which have funded these companies against the security of the 2G licences.

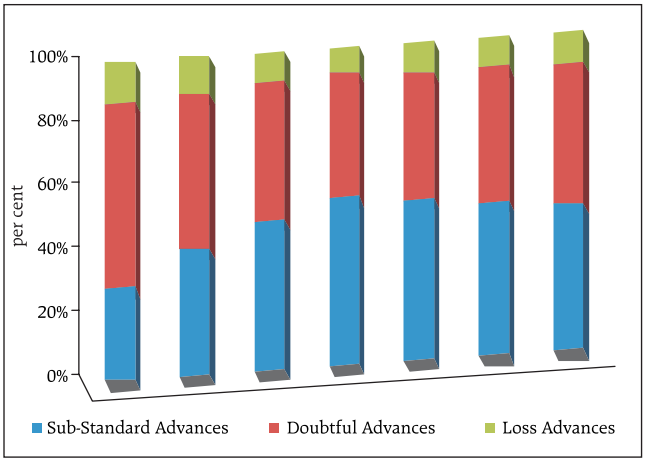
4.54 In a separate development, allegations of irregularities in the sanction of real estate loans have also surfaced in some banks. Detailed enquiries have been undertaken though preliminary findings do not point to widespread irregularities or systemic concerns. Nevertheless, these developments may still have adverse repercussions in the form of overly cautious lending to both the sectors.

Chart 4.34: Growth in the Gross NPAs of Bank Groups



Source: RBI Supervisory Returns

Chart 4.35: Category wise Break up of Gross NPAs of SCBs



Source: RBI Supervisory Returns

[9] Slippage ratio denotes the new impaired loans as percentage of opening stock of performing loans

Restructurings of standard assets

Risk of Slippages in restructured accounts called for continuous vigilance

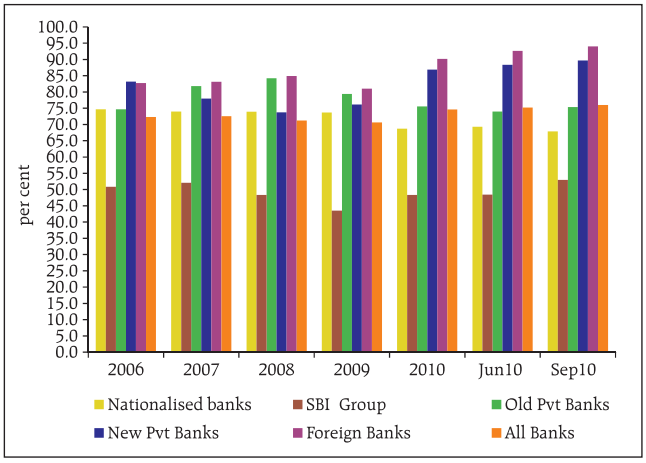
4.55 Since the spillover effects of the global downturn started affecting the Indian economy particularly from September 2008 onwards creating stress for the otherwise viable units / activities, a special regulatory dispensation for a short (limited) period as regards restructuring of stressed standard advances and their asset classification were announced by the Reserve Bank. The quantum of the standard assets restructured increased sharply during 2008-09 by 192 per cent (2.22 per cent of the gross standard advances) and further by 60.18 per cent during 2009-10 (3.03 per cent of gross standard advances). As the currency of the special dispensation expired, fresh instances of restructuring of standard advances have declined sharply. While there is risk of a portion of restructured accounts slipping into NPAs and impairing asset quality, so far there is little evidence of large scale slippages of restructured accounts. An internal study of the impact of slippages of restructured accounts on the capital adequacy position of banks showed minimal impact on CRAR even with an assumed slippage of 30 per cent of the restructured accounts. Nevertheless, there continues to be a need to exercise continued vigilance on this front.

Minimum Provision coverage ratio

Countercyclical measure to arrest slippages

4.56 The provision coverage ratio (PCR)[10] for SCBs was comfortable at 75.9 per cent as at September 30, 2010. The banking sector, in the aggregate, met the regulatory requirement of 70 per cent PCR in September 2010. However, PSBs (accounting for about 73 per cent of the banking sector NPAs) were yet to meet the PCR requirement (Chart 4.36).

Chart 4.36: Provision Coverage Ratio[11] of Bank Groups



Source: RBI Supervisory Returns

Profitability

Low rate of growth in Interest income was a bottleneck in improvement of profitability

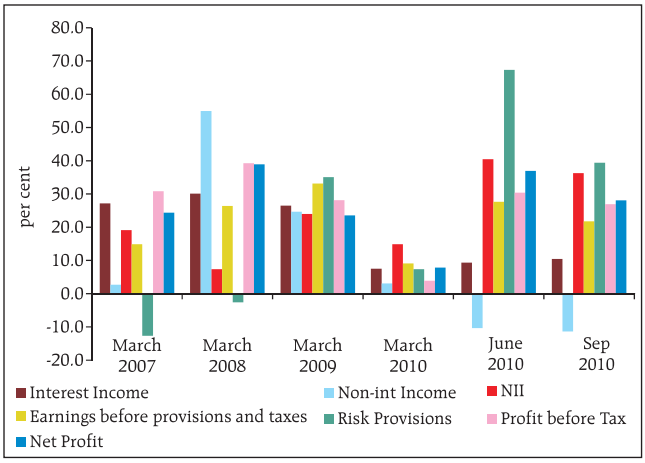
4.57 The SCBs' profitability indicators suffered a setback during 2009-10 as a result of subdued credit

[10] Provision Coverage Ratio = Provisions Held (Specific + Floating) plus stock of technical write-offs / Gross NPAs plus stock of technical write-offs*100.

[11] Data on technical write-off used for the computation of the PCR pertains to the period March 1997 till September 2010, as reported under the RBI supervisory returns.

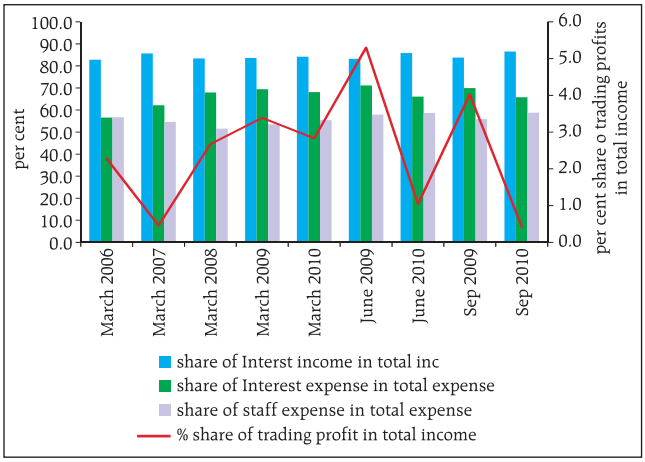
off take and consequent preference for risk free but low yielding investments evidenced during the crisis-affected period (Chart 4.37). Also affecting profitability of banks was the increased requirements for provisions (both due to increased slippages of standard assets and to meet the requirement of 70 per cent provision coverage ratio). In 2010-11, the requirement to compute interest on savings account balances on a daily basis also had an impact on the banks' bottom line. The total income of the SCBs could increase by 6.82 per cent during 2009-10 due to sluggish growth in interest and non-interest incomes (the interest income accounts for nearly 84 per cent of the total income). The decline in the non-interest income was mainly due to reduced profits from forex and trading operations as both declined (by 21.96 per cent and 10.76 per cent respectively) during the year. Foreign banks were observed to have suffered considerable net losses on trading books (Chart 4.38).

Chart 4.37: Growth of Select Components of Income and Expense of SCBs



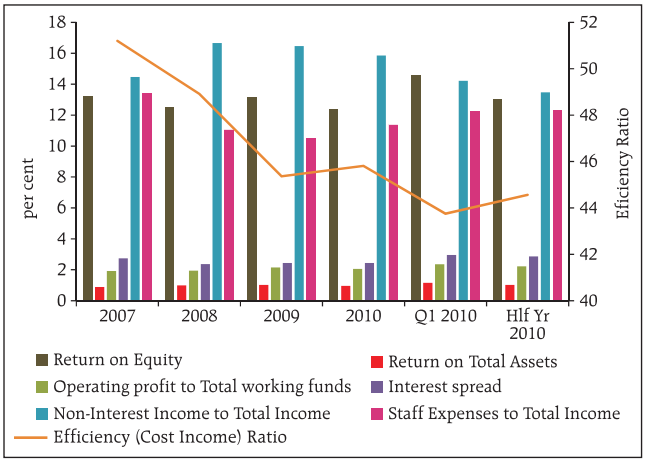
Source: RBI Supervisory Returns

Chart 4.38: Share of Important Components of Income and Expense of SCBs



Source: RBI Supervisory Returns

Chart 4.39: Important Profitability Ratios of SCBs



Source: RBI Supervisory Returns

Profitability ratios reflected less than optimal asset productivity

4.58 The profitability ratios of the SCBs indicated moderate level of concern inasmuch as the Return on Assets (RoA) and the Return on equity (RoE) of the banks deteriorated from 1.02 per cent and 13.18 per cent during 2008-09 to 0.96 per cent and 12.52 per cent respectively during 2009-10. During the half year ended September 2010, the RoA and the RoE showed some improvement (Chart 4.39). Significant observations are the decline in the proportion of non-interest income in total income and the rise in efficiency ratio[12] which had been falling until June 2010. The rise in the efficiency ratio is attributed to relatively higher growth in SCBs' non -interest expense compared to growth in their total income.

Liquidity

Banks remain liquid in short term, however may face stress in the medium to long term

4.59 A liquidity gap analysis (flow approach) in the short term time buckets (up to 28 days) indicates no

[12] Efficiency ratio is also known as Cost to Income ratio. It is the ratio of Non-interest Expense divided by Net Total Income (Net total income is equal to the difference between Total income and interest expense). It is the measure of the extent of net total income which meets the non-interest expenses. A lower efficiency ratio is desirable.

major vulnerability at the system level with positive mismatches seen in all the time buckets (Table 4.2). A stock analysis of the liquidity, based on ratios of asset-liability items, however, indicated certain strains at the system level, mainly on account of increased reliance of the banks on borrowings and decline in the level of liquid assets (Chart 4.40).

4.60 A further analysis of liquidity through ratios reveals an increasing reliance on volatile liabilities to support balance sheet growth (Table 4.3). The share of core deposits to total assets has progressively declined over the years (except in the quarter ended March 2010 and September 2010). Despite a high ratio of temporary assets to total assets, the coverage of liquid assets in relation to volatile liabilities has remained less than one, indicating potential liquidity strains. The dependence on purchased liquidity by the banks as seen from Ratio 3 ([Loans + Mandatory CRR + Mandatory SLR + Fixed Assets] / Core Deposits) however, showed a marginal decline in 2008-09 but changed little thereafter.

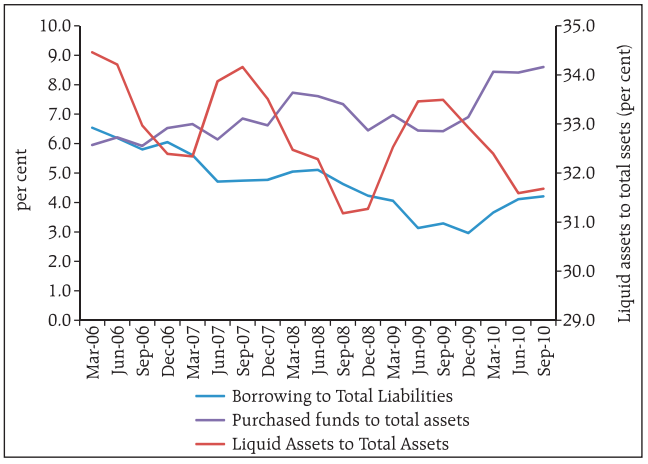
4.61 From a longer term perspective, the maturity profile of the deposits, advances and investments of banks during the period March 2009 – September 2010 revealed that there was concentration of shorter term deposits as against deployment of credit in the medium to long term tenure implying presence of inherent structural mismatches in the SCBs' balance sheet

Table 4.2: Short Term Liquidity Assessment of the SCBs (Flow Approach)

	Net cumulative mismatch as percentage of outflow			
	1 Day	2 to 7 days	8 to 14 days	14 to 28 days
Mar-09	17.80	14.38	7.86	8.63
Jun-09	24.60	23.87	17.19	15.77
Sep-09	34.35	28.48	19.23	16.74
Dec-09	30.96	25.18	19.39	15.71
Mar-10	19.54	14.64	8.13	6.46
Jun-10	12.21	9.02	6.06	6.55
Sep-10	10.79	8.16	4.83	4.48

Source: RBI Supervisory Returns

Chart 4.40: Liquidity Assessment (Stock Approach)



Source: RBI Supervisory Returns

Table 4.3: Liquidity Ratios- Dependence on Short Term Funds for Long Term Financing

	Liquidity Ratios					
Liquidity Ratios	**Mar-06**	**Mar-07**	**Mar-08**	**Mar-09**	**Mar-10**	**Sep-10**
1. (Volatile Liabilities - Temporary Assets) / (Earning Assets - Temporary Assets) (%)	38.4	41.4	43.9	38.2	40.9	40.9
Core Deposits / Total Assets (%)	53.9	52.2	49.3	48.4	49.8	51.0
2. (Loans + Mandatory CRR + Mandatory SLR + Fixed Assets)/ Total Assets (%)	79.9	83.4	85.9	79.4	81.7	82.4
3. [Loans + Mandatory CRR + Mandatory SLR + Fixed Assets] / Core Deposits	1.5	1.6	1.7	1.6	1.6	1.6
4. Temporary Assets / Total Assets (%)	30.3	43.4	52.0	47.9	41.2	47.6
5. Temporary Assets / Volatile Liabilities	0.53	0.65	0.71	0.72	0.65	0.70
6. Volatile liabilities/Total Assets (%)	57.1	66.8	73.1	66.1	63.7	67.7
7. (Market Value of Non-SLR Securities + Excess SLR Securities)/ (Book Value of Non-SLR Securities + Excess SLR Securities)	1.1	1.0	1.0	1.0	1.0	0.9

Source: RBI Supervisory Returns

(Table 4.4). The growing infrastructure financing by the SCBs is likely to further widen the existing asset liability mismatches. However, a large share of low cost deposits (CASA deposits) which are stable help mitigate the liquidity risk.

Table 4.4: Maturity Profile of Deposits and Advances

(per cent)

All Banks		Upto 1 yr	1-3 yr	3-5 yr	Beyond 5 yrs
Mar 09	Deposits	44.00	30.17	7.70	18.13
	Advances	35.14	38.34	9.94	16.58
Jun 09	Deposits	43.88	29.65	8.35	18.12
	Advances	34.37	39.20	10.34	16.09
Sep 09	Deposits	43.53	29.31	8.54	18.62
	Advances	34.15	37.72	10.70	17.42
Dec 09	Deposits	42.67	29.39	8.33	19.62
	Advances	34.24	37.33	10.74	17.68
Mar 10	Deposits	43.91	28.80	8.06	19.24
	Advances	34.47	37.35	10.53	17.65
Jun 10	Deposits	42.77	29.11	8.35	19.77
	Advances	35.08	37.20	10.50	17.22
Sep 10	Deposits	43.16	28.37	8.34	20.13
	Advances	34.58	37.40	10.49	17.53

Source: RBI Supervisory Returns

Interest rate sensitivity

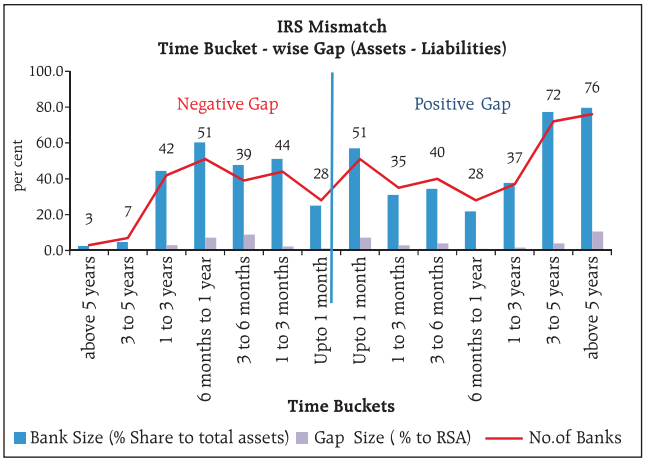
Evidence of increase in interest rate risk is visible

4.62 Though a normal part of banking and an important source of profitability and shareholder value, excessive interest rate risk can pose a significant threat to a bank's earnings and capital base. Interest rate risks are typically measured by simple gap analysis[13] or duration gap analysis[14] or with the help of other more sophisticated tools like Value at Risk (VaR) or Stress Testing Techniques. Regulatory provisions for the SCBs in this regard were first prescribed in February 1999 stipulating a simple gap analysis for interest rate risk measurement from the 'earnings perspective'. Banks were, however advised to migrate to modern techniques such as Duration Gap Analysis (DGA), Simulation and VaR over a period of time.

4.63 Data on maturity time bucket wise Rate Sensitive Assets and Liabilities (RSAs and RSLs) in September 2010 pointed to build up of mismatches in the time bucket of beyond 5 years which may partly be due to increasing exposure to infrastructure financing (Chart 4.41).

4.64 The Reserve Bank has revised its guidelines on the measurement of interest rate risk in November 2010. The banks have now been advised to adopt duration gap analysis in addition to the traditional gap analysis to assess the effect of interest rate changes on the market value of their equities, thereby indicating a significant departure from a rather limited analysis focused only on earnings.

Chart 4.41: Asset Liability Mismatches of SCBs



Source: RBI Supervisory Returns

[13] The gap between interest rate sensitive assets and liabilities arranged in prudential time buckets is multiplied by an assumed change in interest rate to estimate the effect on net interest income.

[14] Duration-based weights are applied to time bands in combination with a maturity/ repricing schedule to provide an approximation of the change in a bank's economic value resulting from a given change in the level of market interest rates.

Measuring Banking Stability (based on select indices)

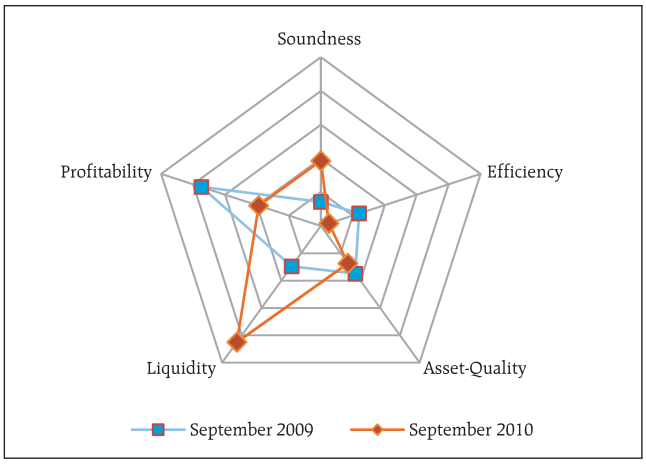
Risks related to liquidity indicators have increased

4.65 An overall assessment of the stability of the banking sector during the year September 2009-September 2010[15] was conducted using a stability map (Chart 4.42). The stability map is based on five critical indices for explaining any change in the risk dimensions of the banking sector with respect to the position as on a past date, in this case with reference to September 30, 2009.

4.66 The banking stability map indicates that risks affecting liquidity of the banking sector recorded dimensional increase (year on year) as at end September 2010 as compared to September 2009. This partially reflects the relative deterioration as indicated by increased reliance of the banks on borrowings and decline in the level of their liquid assets (paragraph 4.59 of this Chapter).

4.67 Soundness indicators show a deterioration as there has been some decline in the capital adequacy ratios of banks vis-à-vis the position in September 2009 though the ratios continue to remain well over regulatory requirements (paragraph 4.45 of this Chapter). Profitability, efficiency and asset quality indicate reduced dimensional risk in September 2010 as compared to September 2009.

Chart 4.42 : Banking Stability Map



Away from the center signifies more risk
Source: RBI Supervisory Returns and RBI staff calculations.

Banking Stability Index

Stability index has strengthened over the years; nevertheless, the improvement rate has slowed down

4.68 The quarterly series of the Banking Stability Index[16] points to an improvement in the stability of the banking sector (as indicated by the aforesaid five sub-indices) over

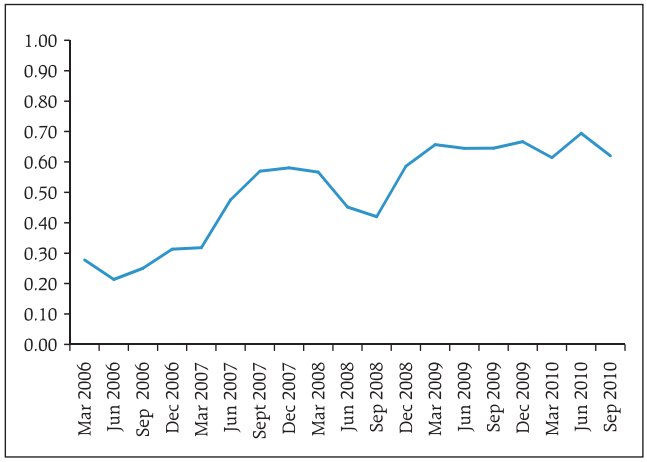
[15] Banking Stability Map has used five key risk dimensions viz. banks' soundness, operational efficiency, asset-quality, liquidity and profitability based on capital adequacy ratio, cost-to-income ratio, non-performing loans to total loans ratio, liquid assets-to-total assets ratio and net profit-to-total assets ratio respectively. CRAR has been calculated under Basel I norms. A measure of each dimension is calculated as the weighted average of the indicator for the banking sector as a whole, where the weights are the ratio of individual bank asset to total banking system assets. The indices were normalised to take values between zero (minimum) and 1 (maximum), the values being the relative measure of performance during the sample period (2006-10). If an index pertaining to a particular risk dimension shows a shift to higher value compared to its value in the past and thereby increases its distance from the centre, it would mean that the risk or vulnerability in that dimension has increased. The index for each risk aspect for a particular period is computed as follows:

(Ratio on a given date/period minus Minimum-value in-the-period) divided by (Maximum-value in-the-period minus Minimum-value in-the-period)

[16] Based on the individual indices, a single point reference in the form of Banking Stability Index has been devised. This index is a simple average of the complementary of five sub-indices chosen for banking stability map.

the past few years. Increased risk perceptions (primarily liquidity risks) led to a marginal decline in the index during the half year September 2010 (Chart 4.43).

Chart 4.43: Banking Stability Index



Higher value signifies more stability
Source: RBI Supervisory Returns and RBI staff calculations.

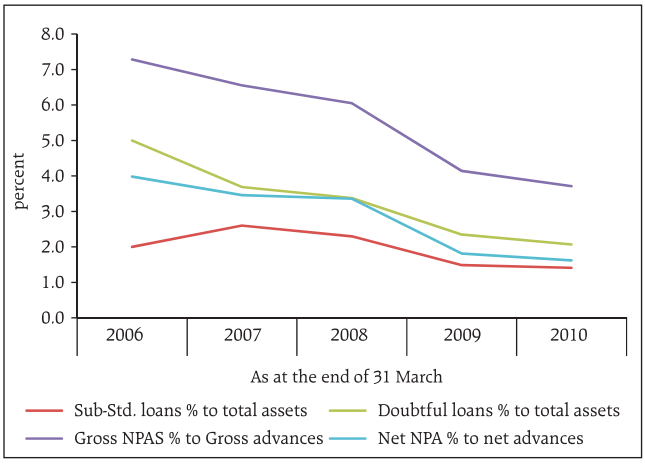
Regional Rural Banks

Consolidation has improved the financial soundness of RRBs

4.69 Regional Rural Banks (RRBs) were conceived as institutions that combined the local feel and familiarity of co-operatives, with the business organisation of commercial banks. Historically, these institutions were plagued with concerns like low capital base, operational inefficiency and mounting losses. To address these issues, a state level sponsor bank-wise amalgamation programme and a separate process of recapitalisation were initiated. Consequently, the number of RRBs was brought down from 196 in 2005 to 82 in March 2010 and 27 RRBs were recapitalised.

4.70 The financial soundness indicators of the RRBs improved during 2009-10. Their net profit grew by 41.1 per cent, balance sheet size increased by 22.1 per cent and net worth increased by 21.72 per cent. The measures initiated for consolidation also resulted in a reduction of the number of loss making branches. RoA improved to 1.1 per cent as compared to one per cent during 2008-09. Asset quality has also improved (Chart 4.44).

Chart 4.44: NPA Ratios of RRBs



* 2010 fig. is Provisional
Source: NABARD

Gradual progression to a regulatory regime similar to other commercial banks

4.71 A gradualist approach to prescription of capital adequacy requirements for RRBs has been adopted in India. Several measures have, however, been taken in recent times to strengthen the regulatory framework for RRBs. RRBs have been advised to disclose the level of CRAR (computed on the lines of Basel-I norms) as Notes on Accounts to their Balance Sheets with effect from March 31, 2008. As on March 31, 2010, there were 53 RRBs whose CRAR was above 9 per cent and 13 RRBs had CRAR above 5 per cent (54 and 11 RRBs respectively in 2009). Seven RRBs had a CRAR of less than one per cent. A Committee constituted by the Government to suggest a roadmap for bringing the CRAR of RRBs to 9 per cent by March 2012 has recommended further recapitalisation of 40 RRBs and has proposed that RRBs with relatively higher net worth be allowed to access the capital markets in due course.

Cooperative Banking Sector

Critical for the achievement of greater financial inclusion

4.72 In India, the cooperatives were the first formal institution to be conceived and developed to purvey credit to rural India. Their wide network, both in urban and the rural regions, supplements the financial intermediation work of commercial banks and play a critical role in fostering financial inclusion. However, their financial viability and soundness as well as duality of control[17] remain key areas of concern. The Committee on Financial Stability Assessment (2009) characterises dual control as "the single most important regulatory and supervisory weakness" in the cooperative banking sector.

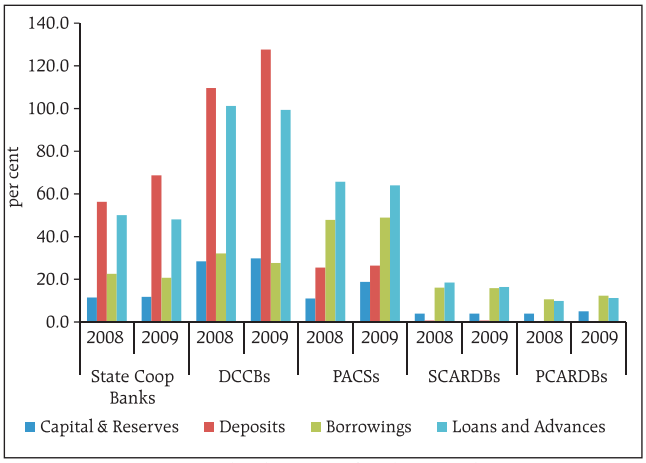
Rural cooperative credit

4.73 The short-term cooperative structure is a three tier structure having State Cooperative Banks (StCBs) at the apex level followed by District Central Cooperative Banks (DCCBs) at the intermediate district level followed by Primary Agricultural Credit Societies (PACSs) at the village level. The longer term structure comprises State Cooperative Agriculture and Rural Development Banks (SCARDBs) and Primary Cooperative Agriculture and Rural Development Banks (PCARDBs).

Financials of rural cooperative credit institutions need further improvement

4.74 Concerns about the financials of the sector persisted – balance sheet growth was modest, long term institutions continued to rely excessively on borrowings and asset quality remained a concern. Profitability indicators showed little improvement. The stipulated minimum net worth could not be achieved in the case of 5 StCBs (out of 31) and 82 DCCBs (out of 371)[18]. Financials showed improvement only in the case of DCCBs (in the short term rural co-operative structure) and in the case of SCARDBs (in the long term structure) (Charts 4.45 and 4.46).

Chart 4.45 : Important Balance Sheet Items of Rural Co-operative Credit Institutions



Source: RBI's Report on Trend and Progress of Banking in India 2009-10

[17] While incorporation/registration and management-related activities of cooperative banks are regulated in the States by the Registrar of Co-operative Societies or the Central Registrar of Co-operative Societies, banking-related activities are under the regulatory/supervisory purview of the Reserve Bank of India or NABARD. This duality of control affects the quality of supervision and regulation and the functioning of co-operative banks.

[18] As per the status report from NABARD in respect of the position as on June 30, 2010

4.75 Another area of concern was the fact that licensing of all StCBs and DCCBs was yet to be achieved. Seven StCBs and 164 DCCBs remained to be licensed as at end-September 2010.

Urban Cooperative Banks (UCBs)

Consolidation progressed as did measures to strengthen the regulatory regime

4.76 The consolidation of UCBs continued under the aegis of the TAFCUB (Task Force for Cooperative Urban Banks) formed in various states in terms of a Memorandum of Understanding between the Reserve Bank and the respective state governments. Out of a total of 103 NOCs for mergers issued by the Reserve Bank, the majority (91) were in respect of weak banks and out of these, 71 mergers have been so far notified.

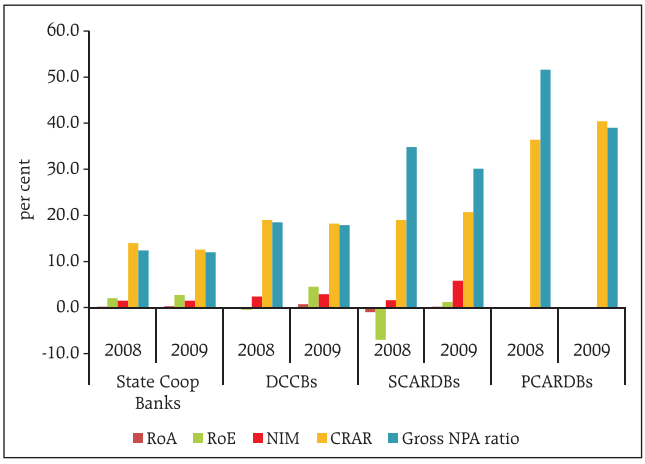
4.77 Grade III and IV banks[19] continued to form a not insignificant chunk of the urban co-operative segment though their number as well as the share of business in the sector have progressively reduced (Table 4.5).

Financial Soundness Indicators

Soft spots remain though consolidation has resulted in some improvement

4.78 As the UCBs perform the same banking functions as commercial banks and are exposed to similar risks in their operations, the capital adequacy norms were

Chart 4.46: Financial Soundness Indicators of Rural Cooperative Credit Institutions



Source: RBI's Report on Trend and Progress of Banking in India 2009-10

Table 4.5: Grade wise Presence of Urban Co-operative Banks

(₹ Crore)

GradeGrade	Number of UCBs		UCBs as percentage of total		Amount of Deposits		Deposits in percentage to total		Amount of Advances		Advances as percentage to total	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
I	845	879	49.1	52.5	102330	128770	65.1	70.4	61761	77265	64.2	70
II	484	465	28.1	27.8	30626	34756	19.5	19	18920	21245	19.7	19.3
III	219	179	12.7	10.7	7954	7494	5.1	4.1	5405	4731	5.6	4.3
IV	173	151	10.1	9	16131	11842	10.3	6.5	10148	7062	10.5	6.4

Source: RBI's Report on Trend and Progress of Banking in India 2009-10

[19] For regulatory purposes, UCBs are classified into Grades I, II, III and IV based on CRAR, net NPA, and profitability during previous years and compliance with CRR/SLR in the previous financial year. Banks with no supervisory concerns are classified as grade I banks. Banks classified in grade II are those which are relatively sound while those in grades III and IV are financially weak banks. From the inspection cycle of March 31, 2009, a revised CAMEL rating model has been made applicable to UCBs.

extended to UCBs with effect from March 2002. The capital adequacy norms for UCBs continues to be on the lines of Basel-I norms. 14 per cent of the UCBs could not meet the regulatory requirement of 9 per cent capital adequacy as at end March 2010 though the capital adequacy of the sector as a whole was above 12 per cent. Eight banks had negative CRAR as at end June 2010 (Table 4.6).

4.79 Asset quality of UCBs remained vulnerable with high gross and net NPA ratios though some improvement has been evident in recent years (Chart 4.47). Provision coverage ratio was comfortable at over 60 per cent in March 2010.

4.80 Profitability indicators were not very healthy and they deteriorated further during 2009-10 (Table 4.7).

4.81 Liquidity stress tests conducted internally pointed to a comfortable liquidity position of UCBs in the normal course of business (the stress tests are discussed in Chapter VI of this Report).

Table 4.6: Capital Adequacy Ratios of Urban Co-operative Banks

	Leverage Ratio	CRAR<3	3<CRAR<6	6<CRAR<9	CRAR>9
Non Scheduled	14	135 (8.3)	25 (1.5)	58 (3.6)	1403 (86.6)
Scheduled	11.8	9 (17.0)	2 (3.8)	1 (1.9)	41 (77.4)
All UCBs	13.0	144 (8.6)	27 (1.6)	59 (3.5)	144 (86.3)

Note: (1) Consolidated CRAR and leverage ratio for the UCB sector as a whole may not be representative of the sector because of the large variation across individual banks.
(2) Figures in parentheses are percentage to respective totals.
(3) Leverage ratio is calculated as 'capital and reserves' to total assets.
(4) Data are provisional

Source: RBI's Report on Trend and Progress of Banking in India 2009-10

Table 4.7 : Profitability Ratios of Urban Co-operative Banks

	Scheduled UCBs		Non-Scheduled UCBs		All UCBs	
	2008-09	2009-10	2008-09	2009-10	2008-09	2009-10P
Return on Assets	1.1	0.7	0.6	0.7	0.8	0.7
Return on equity	9.2	5.7	5.1	4.9	6.8	5.2
Net interest Margin	2.9	2.5	3.3	3.1	3.1	2.8
Non-interest Margin	-1.0	-1.2	-1.6	-1.6	-1.3	-1.4

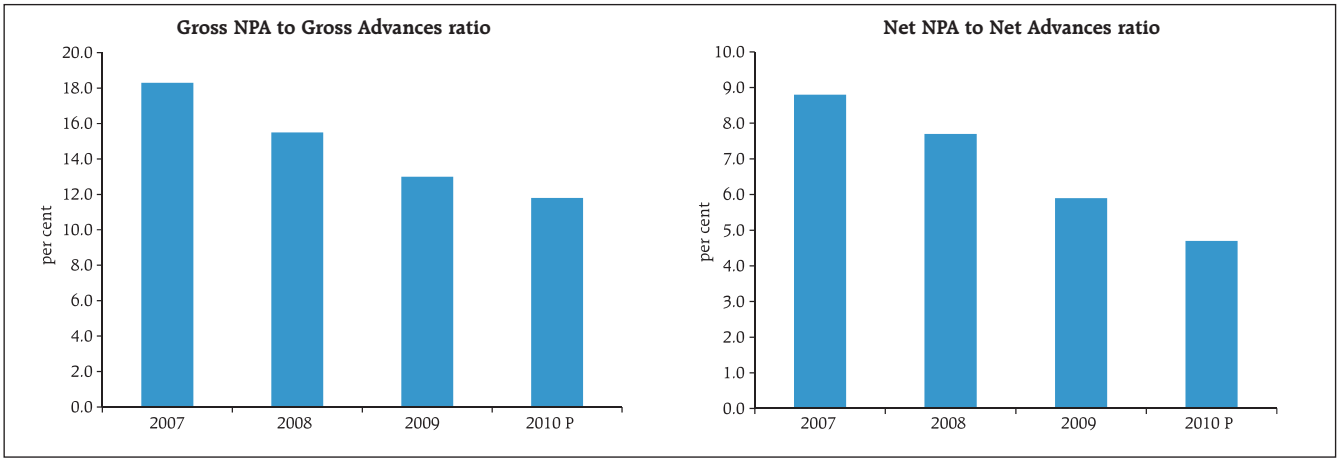
P: Provisional data
Source: RBI's Report on Trend and Progress of Banking in India 2009-10

Non-banking financial companies (NBFCs)

Regulatory regime is being strengthened with focus on balance sheet characteristics of these companies

4.82 The non-banking financial sector in the country is crucial for broadening the access of financial services to a broader segment of the country. This sector is also extremely heterogeneous in terms of size, activities, nature of incorporation, which makes the task of

Chart 4.47: NPA Ratios of UCBs



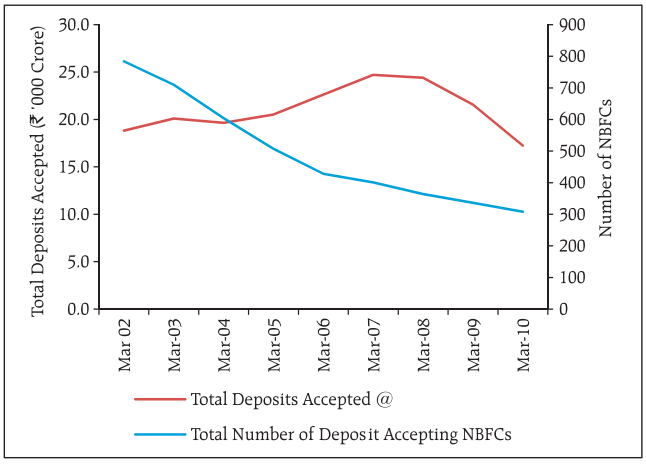
Source: RBI's Report on Trend and Progress of Banking in India 2009-10

regulation and supervision extremely challenging. The Reserve Bank is the regulator and supervisor of all deposit taking non-banking financial companies. Certain non-deposit taking non-banking financial institutions, based on their activity, are also within the regulatory perimeter of the Reserve Bank while other non-banking financial entities are regulated variously by other regulators (the regulatory structure was detailed in the previous FSR). Considering their systemic importance, holding companies or Core Investment Companies have since been brought within the regulatory purview of the Reserve Bank with a view to focusing regulatory attention on containing excessive leverage.

4.83 As discussed in the previous FSR, the Reserve Bank's regulatory mechanism for NBFCs focuses on deposit taking NBFCs (NBFCs-D) and non-deposit taking NBFCs with an asset size of ₹ 100 crore and more which are classified as systemically important non-deposit taking NBFCs (NBFCs-ND-SIs). Since 2007, the regulatory requirements for NBFCs-ND-SIs have been increasingly tightened in view of the growing importance of this segment and its inter-linkages with banks and other financial institutions.

4.84 As the regulatory regime for deposit taking NBFCs has been progressively strengthened, there has been a sharp decline in the number of such entities as well as the quantum of deposits held by them (Chart 4.48).

Chart 4.48: Deposit Taking NBFCs and Quantum of their Deposits



@: Including residuary non-banking companies (RNBCs).
Source: RBI's Report on Trend and Progress of Banking in India 2009-10

Financial Soundness indicators

Capital Adequacy and Asset quality ratios showed improvement but rapid expansion of NBFC - ND- SIs and overall lower profitability was a concern

4.85 Deposit taking NBFCs are required to maintain a minimum CRAR of 12 per cent[20]. In the case of NBFCs ND-SIs, CRAR stipulation as on March 2010 was a minimum of 12 per cent, to be increased to 15 per cent by March 2011. Infrastructure companies are required to maintain CRAR and core CRAR of minimum 15 per cent and 10 per cent respectively. Deposit taking NBFCs, with the exception of four companies, had met the minimum CRAR requirement as at end March 2010 and

[20] 15 % in the case of unrated deposit-taking loan/investment companies

end September 2010. The aggregate CRAR of the NBFCs-ND-SI stood at 39.6 per cent as at end March 2010 as compared with 39.0 per cent in the previous year. The asset quality of the deposit taking NBFCs was also healthy (Table 4.8). The Gross NPA ratio for 2010 (provisional) stood at 1.3 per cent for deposit taking NBFCs while it was 2.6 per cent for NBFCs-ND-SIs in June 2010.

4.86 The balance sheet size of deposit taking NBFCs grew at the rate of 21.5 per cent in 2009-10 as compared with 3.4 per cent in the previous year. The increase in balance sheet size was mostly funded through increased borrowings. The growth was most pronounced in the case of Asset Finance Companies. The asset size of NBFC-ND-SIs increased by 16.7 per cent in 2009-10. This was accompanied by a sharp increase of 22.1 per cent in the unsecured borrowings of the NBFC-ND-SIs, mostly sourced from banks/FIs. On the asset side, their exposure to capital market also increased sharply (28.9 per cent).

4.87 The financial performance of deposit taking NBFCs deteriorated with RoA continuing its declining trend (Chart 4.49). In the case of NBFC-ND-SIs, a marginal improvement was seen in their performance during 2009-10 as their net profits increased by 0.89 per cent. Their RoA, however, declined from 2.2 per cent to 1.9 per cent during the period.

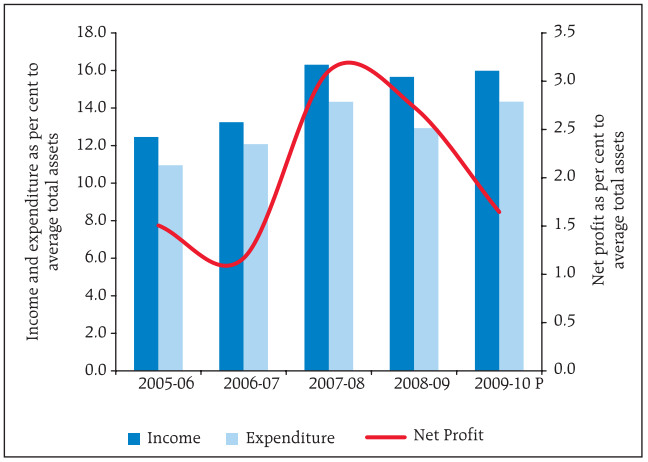
4.88 A critical analysis of the financial performance of the NBFCs sector reveals rapid growth being witnessed particularly in the NBFCs-ND-SI sector, and deterioration in its profitability ratios. The growth of the NBFC sector acquires criticality in the view of the tightening regulation of the banking sector and the fact that the regulation in the NBFC sector remains relatively lighter as compared to that of the banking sector. Several gaps / loopholes in regulations remain which have been discussed in Chapter V of this Report.

Table 4.8: NPA Ratios of Deposit Taking NBFCs

	Gross NPA to Credit Exposure	Net NPA to Credit Exposure
1	2	3
2002	10.6	3.9
2003	8.8	2.7
2004	8.2	2.4
2005	5.7	2.5
2006	3.6	0.5
2007	2.2	0.2
2008	2.1	#
2009	2	#
2010 P	1.3	#

P: Provisional #:Provision exceeds NPAs
Source: RBI Supervisory Returns

Chart 4.49: Financial Performance of Deposit Taking NBFCs



Source: RBI's Report on Trend and Progress of Banking in India 2009-10

Financial Institutions (FIs)

Financial soundness indicators remained robust

4.89 FIs constitute a segment of the non-banking financial sector in the country and there are presently four FIs under the regulatory perimeter of Reserve Bank (EXIM Bank, NABARD, NHB and SIDBI). During 2009-10, while the balance sheet size of the FIs increased by 13.4 per cent, the profitability in terms of RoA declined

marginally from 1.3 per cent in 2008-09 to 1.2 per cent in 2009-10. The FIs remained well capitalised (mainly due to major portion of their profits being retained) with CRAR at 23.23 per cent as on September 30, 2010. A slight reduction in CRAR from its level of 24.17 per cent in March 2010 was evidenced. The high CRAR, to some extent, was nonetheless indicative of less than optimal utilization of their capital funds. The asset quality was robust (with gross NPAs at 0.25 per cent in March 2010 and 0.29 per cent in September 2010) while leverage ratios, at 8.79 in March 2010 and 9.18 in September 2010, were not considered to be excessive.

Concluding remarks

4.90 The banking system in advanced economies continues to be vulnerable to confidence shocks and funding risks and remains excessively reliant on government or central bank support. Banks improved their capital adequacy ratios even as the global reforms agenda unfurled making it clear that banks would have to keep aside much higher quantity and quality of capital than before.

4.91 The financial sector in India remains resilient. Capital adequacy ratios of scheduled commercial banks are well above the regulatory requirements – both from a micro and a systemic perspective - implying that the distance to compliance with Basel III requirements, when adopted, may not be very significant at the system level. Leverage ratios remain comparatively low as compared to ratios in advanced nations. Credit off take improved with rebound in economic growth. Credit acceleration was evidenced across sectors. However, it was particularly marked in case of infrastructure advances and retail credit. Increase in advances in both these sectors has to be viewed with caution – the first because it could aggravate asset liability mismatches despite mitigating factors such as high level of CASA deposits and interest rate reset caluses stipulated by banks and the second because of the higher than average ratio of impaired assets. Several measures have been taken to develop alternative financing options for infrastructure viz., take out financing, infrastructure debt funds, promoting the corporate bond market and the proposed introduction of CDS on corporate bonds, which may reduce the pressure on banks to fund long term projects.

4.92 Asset quality continues to pose some concerns as the growth in NPAs outstripped growth in advances leading to a deterioration of gross NPA ratios. These ratios deteriorated despite increased write offs and one time settlements. Net NPA ratios improved primarily because of increased provisions as banks attempted to meet the regulatory requirement of 70 per cent provision coverage ratio. Profitability of banks was affected due to sluggish growth in their income and increased requirements for provision. Liquidity position of banks was comfortable in the short run but mismatches arise in the longer run. This has resulted in a dimensional increase in the risks associated with liquidity as illustrated by the Banking Stability Map. OBS exposures, especially derivative exposures continued to be concentrated in foreign banks. The ratio of these exposures to balance sheet size of foreign banks is increasing which warrants monitoring.

4.93 The co-operative sector contributed towards greater financial inclusion in the country. Multifaceted efforts at reorganisation of the sector (for example through mergers and amalgamations), recapitalisation, intensive supervision, etc. have led to some improvement in the performance and financial soundness parameters of this segment though many concerns remain. While the segment is not systemically important in terms of size, past instances have amply demonstrated the tremendous impact of any failures in the segment can have on market sentiments with downstream impact on the smooth functioning of the financial sector.

Chapter V
Financial Sector Policies and Infrastructure

The international regulatory community has made significant strides in drawing up a blue print for regulatory reforms which strives to tackle the perceived fault lines in the pre-crisis regulatory set up. The big ask for emerging market economies (EMEs) like India is that the requirements for higher capital come precisely at a time when the growth impetus and greater financial inclusion are expected to result in higher credit off-take. Careful phasing in of the enhanced international requirements will be warranted though the comfortable capital adequacy position of banks in India and the rigorous pre-crisis regulatory framework means that the banking system may not be unduly stretched in adjusting to the higher capital requirements. At the individual bank level, some banks will have to raise additional capital. However, given an extended time frame for implementation of the Basel III measures, it should not present any significant challenge. The use of a macroprudential toolkit has achieved reasonable degree of success in India in countering the potential adverse impact of asset price fluctuations and high credit growth in some sectors on banks' balance sheets. However, important issues need to be addressed if the effectiveness of such policies is to be sustained. Interconnectedness between various segments of the financial markets and between financial market participants has emerged as an important element of macroprudential supervision. Closer supervision of institutions which are highly interconnected in payment and settlement systems or through inter-bank liabilities may be warranted. Adoption of international norms will be challenging and will require concerted efforts and suitable calibration to domestic conditions. The regulation of financial conglomerates (FC) will need to be improved drawing upon international policy developments. The introduction of the financial holding company structure could be a step towards better ring fencing banks from the risks of associated group companies relative to the parent led model in which it is the bank which carries the risks, including reputational risks arising from the activities of the subsidiaries/associates. Enhancing the regulatory framework for Non Banking Financial Companies (NBFCs), plugging regulatory gaps in this sector, addressing the emergent issues relating to the microfinance sector and tackling the very complex issue of the road map for foreign banks in India present important challenges. The payment and settlement system infrastructure continued to function smoothly. Some soft spots remain – concentration of payment and settlement transactions amongst a few participants, concentration of risks in Central Counterparties (CCPs) and the fact that some critical settlement systems remain outside the purview of the Payment and Settlement Systems Act, 2007. Safety net arrangements are in place though some deficiencies and vulnerabilities remain.

5.1 Financial stability depends, in part, on a robust and well-managed financial infrastructure. Reforms in financial policies, improvements in financial market infrastructure and reorganisation of regulatory architecture are all part of a package of measures aimed at ensuring the stable supply of financial services to the real economy and at removing the fault lines which permitted the cyclical build up of risks, several of which were thrown into sharp relief during the global financial crisis.

5.2 The first part of this chapter outlines the unfolding financial sector reforms agenda internationally and highlights the challenges ahead with respect to implementing them in India. The second part discusses the issues thrown up by the single most critical lesson of the crisis – that of the importance of macroprudential supervision for systemic risk management, and presents the results of an empirical exercise highlighting the interconnectedness in the Indian banking sector. The emerging trends in regulatory architecture globally are then discussed and some specific issues/gaps in the Indian context highlighted. Finally, the key developments in financial market infrastructure and in the arrangements for financial safety nets are presented alongwith the critical issues thereof.

Financial Sector Policies

5.3 In the period since the publication of the first FSR in March 2010, there has been significant progress in crystallising the global regulatory reforms agenda which was set in motion with a view to fortify the financial system, correct the incentive framework and ensure its long term stability. While there is considerable emergent international consensus on the requirement for more stringent regulatory norms, there is a simultaneous realisation that, given the current health of the banking and financial system and of the global economy, a well calibrated transition is mandatory to ensure that the still fragile, global recovery is not impeded.

5.4 The Basel Committee on Banking Supervision (BCBS) has announced a series of measures to strengthen prudential or firm level regulation which will help in raising the resilience of the individual financial institutions. The Committee has also announced a series of reform measures with a macroprudential focus to address system-wide risks. The Financial Stability Board (FSB) has coordinated a range of regulatory reforms including measures to address the moral hazard risk associated with Systemically Important Financial Institutions (SIFIs), ensure supervisory intensity and effectiveness, reduce reliance on credit rating agencies, improve compensation practices and effect reforms in the OTC derivative markets. Some progress has also been made in achieving convergence in international accounting standards.

5.5 The previous issue of the FSR had outlined the various policy initiatives taken prior to and during the financial crisis which enabled the Indian financial system to remain resilient in the face of the disturbances to financial stability internationally. The strong regulatory and supervisory framework put in place in the country for financial institutions, especially banks, financial markets and financial infrastructure imply that adjusting to many of the reform measures being contemplated internationally may not unduly stress the system. In fact, several measures that are now being thought about internationally have already been designed into the Indian regulatory architecture. Nevertheless, the proposed reforms agenda calls for a shift in certain policy approaches.

Capital Adequacy Framework – BCBS proposals

5.6 Collectively, the new global standards to address both firm-specific and broader, systemic risks have been referred to as "Basel III". Basel III comprises the following building blocks, which have been agreed and issued by the Basel Committee and the Governors and Heads of Supervision between July 2009 and September 2010:

- Raising the quality of capital to ensure banks are better able to absorb losses on both a going concern and a gone concern basis;
- Increasing the risk coverage of the capital framework, in particular for trading activities, securitisations, exposures to off-balance sheet (OBS) vehicles and counterparty credit exposures arising from derivatives;
- Raising the level of the minimum capital requirements, including an increase in the minimum common equity requirement from 2 per cent to 4.5 per cent and a capital conservation buffer of 2.5 per cent, bringing the total common equity requirement to 7 per cent;
- Introducing an internationally harmonised leverage ratio to serve as a backstop to the risk-based capital measure and to contain the build-up of excessive leverage in the system;
- Raising standards for the supervisory review process (Pillar 2) and public disclosures (Pillar 3), together with additional guidance in the areas of sound valuation practices, stress testing, liquidity risk management, corporate governance and compensation;
- Introducing minimum global liquidity standards consisting of both a short term liquidity coverage ratio and a longer term, structural net stable funding ratio; and
- Promoting the build up of capital buffers in good times that can be drawn down in periods of stress, including both a capital conservation buffer and a countercyclical buffer to protect the banking sector from periods of excess credit growth.

5.7 A timetable for the transition to the new standards[1] has also been announced based on, *inter*

[1] http://www.bis.org/publ/bcbs179.pdf

alia, the findings of a Quantitative Impact Study conducted by the Basel Committee. National implementation of the Basel III capital requirements in respect of common equity will begin on 1 January 2013 and is expected to be completed by 2015. Thereafter, the calibration of the capital conservation buffers will commence, reaching the final level at the end of 2018.

The proposed capital rules – the banking system not likely to be unduly stretched but some banks may face some challenge

5.8 The Basel III proposals reflect the lessons from the crisis and are expected to be "quite game changing"[2]. In particular, for emerging economies like India, the implementation comes at a time when credit demand is expected to pick up given, *inter alia*, the compulsions of robust growth, the investment needs of infrastructure and the demand ushered in by increasing financial inclusion. Simultaneously meeting the requirements of additional capital buffers and the sharply growing credit needs of the economy at an affordable cost will be no easy task. However, the comfortable capital adequacy position of the banks in India (CRAR at over 14 per cent and core CRAR at over 10 per cent as on September 30, 2010) under Basel II norms means that the Basel III requirements, once fully calibrated, are not likely to be very much higher than the current position.

5.9 Nevertheless, there remain important challenges. First, there could be some impact when the new standards are adopted due to shifting of some deductions such as intangible assets and deferred tax assets from Tier I and Tier II capital to common equity. A quick estimate of the impact of the requirements under Basel III on the capital adequacy ratio of banks in India indicates, however, that, on application of the Basel III deductions for common equity, the common equity ratio will remain above 7 per cent.

5.10 Notwithstanding the current position at the aggregate level, the capital adequacy ratios for a few individual banks may fall short of the Basel lII norms in the coming years, which means capital may need to be augmented. However, as the phase in time allowed is long enough, these banks should be able to adjust to the enhanced requirements comfortably.

5.11 A further impact is likely to result from the proposed changes aimed at increasing the risk coverage of the capital adequacy framework. The proposed changes in respect of the counterparty credit risk framework are likely to have implications for the capital adequacy ratios of banks in India, especially those with large OTC derivative positions. However, the impact from the changes proposed to securitisation exposures and trading book positions may not be very significant.

Leverage ratio not expected to be a binding constraint

5.12 Leverage of Indian banks remains moderate and is unlikely to be affected by the Basel Committee's present proposals in this respect. However, some concerns arise with respect to the treatment of the statutory liquidity ratio (SLR) portfolio of the banks. As the portfolio is a regulatory mandated part of the bank's balance sheet, there is a strong argument in favour of excluding the portfolio from calculations of leverage. The argument is further strengthened by the fact that this portfolio carries only moderate risk. Proposed international norms do not, however, permit this and require that no assets, including cash, should be excluded from the measurement of the leverage ratio.

Liquidity position comfortable – but some challenges remain

5.13 Most Indian banks follow a retail business model and do not depend much on short term / overnight wholesale funding. They also have a substantial amount of liquid assets which should enable them to meet the new standards for liquidity. Hence, many of the new requirements under Basel III are not expected to unduly stretch banks in India.

5.14 There remains an issue about the extent to which SLR holdings can be taken into consideration for the purpose of calculating the liquidity ratios. As these holdings are required to be maintained on an ongoing basis, there could be an argument that they should not be reckoned at all. However, it may be reasonable to reckon at least part of the SLR holdings in calculating the liquidity ratio under stress conditions, as the SLR

[2] "Post-crisis Reforms to Banking Regulation and Supervision – Think Global, Act Local', Inaugural address by Dr. D. Subbarao, Governor, Reserve Bank of India, at the FICCCI-IBA Conference on Global Banking: A paradigm Shift", September 2010

holdings are primarily government bonds against which the Reserve Bank provides liquidity.

5.15 Banks in India may have to deal with the complex job of formulating and predicting liquidity stress scenarios with reasonable accuracy and consistency according to the requirements of the new liquidity standards. Given that Indian markets have not experienced the levels of stress that global markets were subjected to, predicting stress scenarios is going to require a qualitative judgemental call. Adding to the difficulty would be the constraints in availability of accurate and granular data in a timely manner.

Calibration of buffers requires careful judgement about the macroeconomy

5.16 The calibration of the proposed countercyclical buffers requires important judgements about the state of the macroeconomy. This implies understanding the stage of the business cycles at the aggregate and sectoral levels, which presents some difficulties. The deviation of credit-GDP ratio from its long term trend is generally used for the purpose, but this metric has not proved to be a reliable indicator in emerging markets like India where it tends to rise for structural reasons – higher credit off take due to higher growth and greater financial inclusion. In fact, a study undertaken by the Reserve Bank shows that the credit to GDP ratio has not historically been a good indicator of build up of systemic risk in the banking system. Even the sectoral countercyclical policy measures undertaken by the Reserve Bank in the last decade or so have relied on a number of qualitative and quantitative indicators - deteriorating underwriting standards revealed by onsite inspection of banks, signs of under pricing of risks in the real estate sector, emerging trend of second homes for investment purposes, anecdotal evidence in respect of build up of inventories of completed properties and steep increase in land prices – many of them not easily quantifiable.

The NBFC sector is expanding rapidly even as regulatory norms are tightened

5.17 Tightening the regulation of the banking sector increases the incentives for regulatory arbitrage by moving business to non-banking financial institutions (NBFIs). This is particularly so in the current environment in India when NBFCs (in particular, the non-deposit taking systemically important NBFCs) are expanding rapidly and both interconnectedness and product competition across types of institutions are intensifying. Regulatory reforms in the non-banking sector as well as enhanced supervision to indentify and plug scope for regulatory arbitrage would be critical in ensuring that the proposed reforms achieve their objective of creating a more resilient financial sector. Several initiatives have been taken to tighten the regulatory framework for the non-banking financial sector which include, *inter alia,* increasing application of prudential norms as applicable to banks to the shadow banking sector[3] .

Assessing the impact of the reforms package

5.18 Not surprisingly, there has been considerable attention on the final form of the proposed reforms, their implications, pros and cons and impact on global growth. Three recent studies, two by the Bank for International Settlements (BIS) and one by the Institute for Industrial Finance (IIF), a Washington based private sector body, have arrived at different estimates of the impact of the reforms on growth, both in the short and long term.

5.19 According to the BIS study, there could be a modest impact of the transition towards higher capital standards on aggregate output, especially if the higher requirements are phased in gradually (a percentage point increase in the bank's ratio would lead to a decline in annual growth rate by an average of 0.04 per cent over a four and a half year period). The IIF study concludes that the implementation of regulatory reforms would subtract an annual average of about 0.6 per cent from the path of real GDP for the G3 (US, Euro Area and Japan) over a five year period and an average of 0.3 per cent over a ten year period. The differences in estimates are partly a result of differing assumptions as also a consequence of the weak database and the fact that many relationships in the financial markets and between the financial and the real markets are non-linear.

5.20 The Reserve Bank has also made a preliminary assessment of the increased capital requirements on the country's growth path and will calibrate the phase

[3] Reserve Bank of India, Report on Trends and Progress in Banking, 2009-2010 (http://rbi.org.in/scripts/PublicationsView.aspx?id=12975)

in of the standards to ensure that any sacrifice of growth is within acceptable limits.

Managing the moral hazard posed by SIFIs

5.21 The financial crisis brought to the centre stage the need to ensure that large and complex financial institutions (LCFIs) are subject to regulatory and supervisory requirements which are commensurate with the degree of risk they pose to the financial system. The crisis underscored the moral hazard associated with such "too big or too interconnected to fail" entities – markets /investors believe that the LCFI will be bailed out in the event of distress, thus requiring a lower rate of return on debt issued by them which translates into a "funding advantage" for such entities and providing incentives for higher risk taking[4]. The problem is exacerbated as most jurisdictions do not have in place adequate legal frameworks to deal with distressed large and interconnected financial firms. As the 12th Geneva Report on the World Economy states, "*The end game – resolution of failing institutions - is not well defined at a cross border level and often within countries as well*".

5.22 International efforts at reforming policies related to SIFIs have proceeded towards addressing three specific issues: (i) reducing the probability and impact of failure via higher prudential requirements including higher capital requirements, better supervisory practices, potential limitation on the size, breadth and intra-group connectivity; (ii) improving resolution capacity; and (iii) strengthening core financial infrastructures and markets to address interconnectedness and lessen the risk of contagion in case of failure.

5.23 The work involved, however, necessitates answers to some very complex questions. In the first place, there is the ticklish issue of assessing the systemic importance of a financial institution. International opinion[5] is veering towards a combination of factors, primarily size (relative or absolute), interconnectedness (i.e. linkages with the rest of the system e.g. through interbank lending or as an important counterparty in a key market) and substitutability (the extent to which other components of the system can provide the same services in the event of a failure). These factors can, at best, constitute the basic criteria for measuring the systemic importance of an institution and the final decision will need to incorporate institutional factors - both quantitative and qualitative.

5.24 The specifics of higher prudential requirements for SIFIs, including the magnitude of higher loss absorption capacity are still under preparation. Work is ongoing for improving the resolution capacity of firms, putting in place firm specific recovery and resolution plans (RRPs) and developing an effective resolution regime for cross border financial institutions.

5.25 A related issue involves the imposition of a levy or tax on the financial sector to ensure that the sector pays for the costs associated with any government intervention. A few countries have announced or are considering such taxes and the IMF has made a series of recommendations in the matter. However, there is no international consensus on the issue and while the tax payer should not have to pay for the rescue of the financial sector, an ex ante financial sector levy cannot be a one size fits all solution. In India, in particular, proactive regulation, caps on leverage and cash reserve ratio (CRR)/SLR prescriptions can reduce the need for any bail out.

Increasing the loss absorbency of regulatory capital

5.26 A separate set of proposals internationally aim at the introduction of new tools that ensure that uninsured creditors also face credible threats of incurring losses should a financial institution run into difficulties. Contingent capital and bail-in capital are two variants of such tools (Box 5.1).

Architecture for the supervision of SIFIs in India – robust but some challenges remain

5.27 The previous FSR had outlined in detail the existing arrangements for regulation and supervision of large financial institutions (FCs) in India. The financial system in India is largely dominated by banks,

[4] "The value of "too big to fail" big bank subsidy", D. Baker and T. McArthur, CEPR Issue Brief, 2009

[5] IMF: "Guidance to assess the systemic importance of financial institutions, markets and instruments", 2009

Box: 5.1: Restructuring the Liability Structure of a Bank's Balance Sheet: Contingent Capital and Bail-ins - Perspective and Issues

There has been considerable international interest in re-designing the liability structure of banks' balance sheets, primarily to deal with funding issues and reducing moral hazard of too big to fail institutions. The underlying idea is that there should be enough loss absorbing capacity on the liability side of the balance sheet to absorb all losses without tax payers' support, and the loss absorption should occur in a way which does not shock the system or disrupt essential business activities such as lending. While the focus in this regard has been on finding methods to lengthen bank debt maturities and calibrating a Net Stable Funding Ratio (NSFR), many other proposed measures have also found a place in the policymakers toolbox. Among them, two measures that have generated substantial global debate are Contingent Capital and Bail-ins. Contingent capital, also known as CoCos, has already made its way into regulatory framework whereas bank creditors' bail-in is in a nascent stage of development.

CoCos' are a form of debt that converts to equity when a bank faces financial distress. In principle, they are debt instruments in normal times that automatically convert into common equity when a pre-specified stress related trigger is breached. The triggers can be linked to the deterioration in the condition of the specific banking institution and/or to the banking system as a whole. However, using contingent capital during tough times does not necessarily imply actual cash being transferred to the bank, but could simply mean a change in its existing liability structure. On the other hand, bank creditors' bail-in, though similar to contingent capital in its objective, is functionally different as it would possibly apply to a larger part of banks' liabilities and could encompass future as well as existing debt. Bail-ins essentially turn the whole capital structure into contingent capital. The modalities of bail-ins are still under discussion and could take various forms, for instance, a simple haircut and/or a mandatory conversion of senior debt into equity. The current working assumption is that haircut to senior creditors will be imposed only after common equity and subordinated debt are wiped out. Therefore, bail-ins are expected to take place close to the point of non-viability of the bank, which may raise some issues as to the feasibility of bail-ins.

While conceptually both contingent capital and bail-ins appear to be simple yet stout instruments, implementing them is far from easy. An important factor for contingent capital securities to prove effective as a buffer is that the conversion triggers need to be set at the appropriate level. However, this appropriate level is difficult to determine before a crisis actually hits. Published capital ratios can be lagging indicators of financial strength and can be calculated more conservatively by one bank than another. The second issue relates to pricing of contingent capital instruments, which is key to have an investor base. It is almost impossible to see a significant drying up of liquidity near the trigger, which will have an influence on the price. Moreover, the behaviour and psychology of all stakeholders near the trigger point is not clear and hard to model. Hence, the pricing of contingent capital is not an easy task. The third issue emanating from contingent capital is the fixed income seeking investors, mostly insurance companies, that they attract. This increases interconnectedness since a transmission channel is created that transfers risk from the banking sector to the insurance sector. The conversion of contingent capital may result in losses for the insurers and although conversion may help to resolve a banking crisis, it could create an insurance crisis or a run on certain mutual funds that invest in contingent capitals. Moreover, after conversion, some fixed income investors may end up with equity shares which their investment mandates do not allow them to hold. As a consequence, they will be forced to sell these shares, potentially at fire sale prices. This is likely to put additional pressure on the share price of the bank that could further accentuate investors' losses. Similar issues are also associated with bail-in instruments. The most obvious impact would be an increase in the cost of funding for the banking sector as a whole, as the bail-in instruments will have to be priced significantly higher to attract investors. Bail-ins can be effective tools for resolution or recapitalisation of a failing institution. This can be achieved by either having a resolution regime that empowers regulators to impose losses on various categories of fund providers or by having categories of fund providers which are contractually committed in advance to absorb losses (via write-down or conversion to equity) so as to achieve recapitalisation. The first instance would require enactment of new legislation which give regulators the resolution powers to impose write-down or conversion on specified categories of non-capital fund providers. On the other hand, using a contractual route would require that a certain minimum proportion of RWAs should be funded by securities which include convertibility or bail-in procedures within their contractual terms.

Irrespective of the many challenges involved in implementing both contingent capital and bail-ins, they are policy alternatives that can dramatically reduce systemic risk by protecting depositors, transaction payments and key customer activities and by reducing cost of big bank failure and risk of runs. Contingent capital and Bail-in could work together, if purpose of each are made clear. Contingent capital could be used to force early action, create management incentives and address smaller crises, while bail-ins would be the army in reserve, that would be used to eliminate tail risk and help contingent capitals to be more convincing.

References:

a) Contingent Capital: an in-depth discussion- Stan Maes and Wim Schoutens

b) Contingent Capital With A Capital Ratio Trigger- Paul Glasserman and Behzad Nouri

and in most cases they are also the parents of the identified FCs. The current supervisory structure envisages a two-pronged approach encompassing off-site surveillance and periodic interface with the conglomerates, which has proved quite robust in assessing the risks faced by these institutions. Going forward, however, improvements in the regulation and supervision of these large financial firms may be warranted.

Differential prudential norms may be warranted, going forward

5.28 First, the current approach towards FCs is focussed primarily on more intensive supervision and no differentiated prudential requirements have been considered necessary. International regulatory requirements may also not immediately mandate separate prudential requirements for the large domestic firms which are not Global SIFIs. None of the Indian banks are likely to be considered Global SIFIs. Regardless, policies for domestic SIFIs will need to be strengthened drawing on international policy developments in this respect.

A bank holding company structure may ring fence risks better

5.29 The second issue relates to the organisational structure of FCs in India. Deregulation and financial consolidation have led to the development of Financial Holding Companies – allowing commercial banking, insurance, investment banking and other financial activities to be conducted under the same corporate umbrella. In India, however, the parent led model is predominant and any expansion of the activities of a bank can take place either within the bank (Universal Bank) or by way of setting up of subsidiaries / associates/ joint ventures (Bank Subsidiary Model). In this kind of a model, it is the bank which carries the risks, including reputational risks arising from the activities of the subsidiaries/associates. The bank also holds the responsibility of corporate governance in the group. The model may also require banks to set aside a substantial amount of equity to ensure that the subsidiaries are well capitalised. Relative to this, a holding company structure is likely to reduce the risks carried by the bank. A Working Group has been constituted in the Reserve Bank to recommend a roadmap for the introduction of a bank holding company structure together with the required legislative amendment/ framework.

Orderly resolution of FCs could be legally and operationally difficult

5.30 There are several legal and operational difficulties with respect to the infrastructure in place for the orderly resolution of institutions, more so for complex financial institutions. As discussed in paragraph 5.123 of this Chapter, there are limited resolution options available with the Reserve Bank and with Deposit Insurance and Credit Guarantee Corporation (DICGC), the deposit insurer.

Interconnectedness with the non-banking sector continues to be critical

5.31 The fourth and most critical issue related to the operations of FCs in India, as also globally, arises from the inter-connectedness with the non-banking financial sector. While NBFCs (both deposit taking and large non-deposit taking entities) are regulated by the Reserve Bank, other entities are regulated by, *inter alia*, Insurance Regulatory and Development Authority (IRDA), Securities and Exchange Board of India (SEBI) and National Housing Bank (NHB). A coordination mechanism in the form of High Level Co-ordination Committee on Financial Markets (HLCC-FM) (the HLCCFM Technical Committee on RBI Regulated Entities to be precise) has been designated as the inter-regulatory forum for having an overarching view of the FC monitoring mechanism. The Indian financial system is largely a bank dominated one. Outside of the banking sector, however, the capital and liquidity regulatory framework is less rigorous though tightening of the regulatory framework for the sector is an ongoing exercise (paragraph 5.17 of this Chapter).

Compensation

Compensation was always regulated in India – fine-tuning the framework underway

5.32 The particulars of the way towards risk-adjusted compensation are far from clear. Yet, the details of how compensation is earned are essential to sound practices. Post crisis, therefore, compensation has become one of the important areas for reforms. In

India, the compensation of CEOs of banks has always been regulated - fixed by the Government in case of public sector banks and requiring approval of the Reserve Bank in case of the private sector and foreign banks[6]. Notwithstanding, in line with steps taken by the global community, the Reserve Bank has also had a re-look at the current compensation practices of banks. In July 2010, the Reserve Bank issued draft guidelines on compensation practices of private sector banks and foreign banks for public comments. The draft guidelines stipulate norms covering all employees of banks, risk takers as well as risk control staff. They cover various aspects of the compensation framework, viz., governance, risk alignment and disclosure, and are in broad conformity with the FSB principles on compensation[7]. The final guidelines will be issued taking into account the comments received from all stakeholders.

Credit Rating Agencies (CRAs)

Reducing reliance on CRAs – the way forward

5.33 The Financial Stability Board, in a bid to reduce the 'cliff effects' from CRA ratings that can amplify procyclicality and cause systemic disruption, has endorsed a set of principles to reduce authorities' and financial institutions' reliance on CRAs. The principles cover five types of financial market activity: prudential supervision of banks; policies of investment managers and institutional investors; central bank operations; private sector margin requirements; and disclosure requirements for issuers of securities. National and regional authorities internationally have already started taking steps to lessen such reliance or are considering ways to do so. There remain, however, several issues with reducing such reliance.

Identifying objective alternatives to CRAs presents difficulties

5.34 In India, the Reserve Bank has been emphasizing that banks should carry out their own assessment and not rely on ratings exclusively. However, the removal or replacement of CRA ratings in regulations, and the associated reduction in market reliance, cannot happen overnight. In many cases, it will require the development of alternative measures of creditworthiness and of additional risk management capacity, which will take some time. In particular, the reliance of banks on external ratings for arriving at their capital requirements using the Standardised Approach under Basel II is likely to continue in many jurisdictions, including India. Very few banks can be expected to migrate to the Internal Ratings Based approach. Also, in order to strengthen investors' ability to make their own credit assessments, the quality and quantum of disclosure by issuers of securities would also have to improve significantly.

Regulatory regimes for CRAs being strengthened internationally

5.35 The crisis, *inter alia*, underscored the need for an effective regulatory oversight regime of CRAs. Post-crisis, a number of national and regional initiatives have been taken or are underway to strengthen the oversight of CRAs. The emerging challenge from these initiatives is the need to avoid inconsistencies or frictions arising out of differences among the new CRA regulations in different jurisdictions.

Functioning of CRAs in India robust, but the regulatory framework needs to be strengthened

5.36 There was no prima facie cause for concern in the functioning of the rating agencies in India even in the context of the financial crisis. However, there remains a need to ensure that the CRAs comply with extant codes of conduct and that generic issues such as accountability, transparency and conflicts of interest, which are also being grappled with at the international level, are taken care of. The rating requirements in India are essentially driven by regulatory policies applicable to exposures of the regulated entities to various asset classes. While the Securities and Exchange Board of India (Credit Rating Agencies) Regulations, 1999 empower SEBI to regulate CRAs operating in India, SEBI's jurisdiction over the CRAs only extends to their activities in securities market and dealings of CRAs specifically in instruments categorized as "securities" as defined under the Securities Contract (Regulation) Act, 1956 and does not cover the activities governed

[6] In terms of the Banking Regulation Act, 1947

[7] "Principles on Sound Compensation Practices", FSB, April 2009

by other regulators. It is thus imperative that the accreditation process of rating agencies in respect of such activities coming under other regulators and the rating methodology employed for such activities is looked into by the regulator concerned. In respect of banks, the Reserve Bank does accredit CRAs as External Credit Assessment Institutions based on a rigorous evaluation.

5.37 The entire gamut of issues relating to the regulatory infrastructure in place for CRAs was examined by a 'Committee on Comprehensive Regulation of Credit Rating Agencies' formed at the behest of the HLCCFM. The Committee flagged some of the above areas of potential concern relating to the functioning of CRAs and has highlighted the need for strengthening the regulatory architecture in this respect.

5.38 Given the continuing criticality of CRAs in the financial sector, the regulators would also need to work towards further strengthening the rating framework. The system needs to shift away from issue-rating to issuer rating - the rating assigned to a particular instrument cannot be taken as reflective of the credit risk of the issuing entity. The rating agencies are supposed to adopt a through the cycle approach while assigning ratings. The regulators, nevertheless, need to use the risk weights applicable to the external ratings dynamically as per their assessment of systemic risk on a sectoral basis.

International accounting standards

Roadmap for convergence with international standards announced

5.39 A Core Group appointed by the Ministry of Corporate Affairs (MCA) has, since the publication of the first FSR, released phased road maps for convergence with International Financial Reporting Standards (IFRSs) for corporates and banks in India. While scheduled commercial banks are required to converge with the IFRS with effect from April 01, 2013, a phased arrangement for Urban Co-operative Banks (UCBs) and NBFCs has been suggested depending on the size of the entity and on whether the NBFC is listed or not. Regional Rural Banks (RRBs), UCBs and NBFCs with a relatively smaller net worth will continue to follow the notified Indian accounting standards.

Critical accounting standards are currently moving targets and may pose difficulties

5.40 The Indian banking system will need to address certain issues in implementing the convergence with the IFRSs. First, the very crucial IFRS 9 relating to Financial Instruments, is still evolving and the final standard is unlikely to be available before the middle of 2011. Thereafter, the Institute for Chartered Accountants of India (ICAI) will need to promulgate the converged standard for India. The migration to the 'fair value' regime in certain cases and the adoption of expected loss approach to loan loss provisioning could pose significant challenges as extensive guidance may not be available in India in terms of market practices or benchmarks. Converging to the standards would require considerable skill upgradation and modification in the IT systems of banks. The Reserve Bank has constituted a Working Group to address the implementation issues and facilitate formulation of operational guidelines for the convergence.

Macroprudential analysis and systemic risk management

A macroprudential approach to policy – the critical lesson from the crisis

5.41 Explicit pursuit of macroeconomic and financial stability can be said to be the single most significant take away from the recent crisis. The post crisis framework for the regulation of the financial sector has come to encompass two distinct, but highly interrelated constructs - that of macroprudential policy and of systemic risk management. Macroprudential policy requires calibration of financial policies /regulatory and supervisory arrangements from a systemic perspective rather than from the perspective of individual institutions. Systemic risk *per se* is a complex concept with there being little agreement about a precise definition amongst policy makers and academicians (Box 5.2).

Both time and cross sectional aspects of macroprudential policy are being addressed

5.42 Typically, a macroprudential approach to policy encompasses two dimensions – there is a *time dimension*, dealing with how aggregate risk in the financial system evolves over time. And there is a *cross-sectional* dimension, dealing with how risk is allocated within the financial system at a point in

Box 5.2: Measuring Systemic Risk - Issues and Options

The global financial crisis has created renewed interest in unraveling the unknowns that builds up systemic risk. *Systemic risk is now widely accepted as the fundamental underlying concept for the study of financial instability and possible policy responses*[8] . From the days when systemic risk was narrowly used to refer to bank runs and currency crisis, its definition today has become much more broad based. Systemic risk *per se* is a complex and diffused concept. It can be defined as the probability that a series of correlated defaults among financial institutions, occurring over a short time span, will trigger a withdrawal of liquidity and widespread loss of confidence in the financial system as a whole. Two key elements which underscore the definition of systemic risk are shocks and propagation mechanisms. Shocks can be either idiosyncratic, that essentially effects only a single institution, or systemic which effects the entire financial system. Propagation or the transmission mechanism on the other hand determine how an initial idiosyncratic or systemic shock spreads across the financial system. These shock waves are akin to the geological waves created by an earthquake, in the manner that it spreads either horizontally or vertically. While the horizontal systemic risk refers to the spread of shock in the financial sector alone, the concept of vertical systemic risk is concerned with the spread of an initial shock experienced by the financial sector to other sectors of the economy. Since the occurrence of both shocks and the subsequent propagation are uncertain, a *systemic event* can have disastrous effects. However, prudent financial regulation can play a defining role in countering the ill effects of systemic risk. But prior to initiating regulatory reforms, it is absolutely necessary to develop dependable measures of systemic risk which captures all the linkages and vulnerabilities present in the entire financial system and they should be designed to facilitate monitoring and regulation of the overall level of risk to the system.

Post crisis, numerous studies on systemic risk has been done. An equal number of methods to ascertain systemic risk and the ways to deal with it have also been propounded. While no one method can address all the intricacies that are characteristic to each financial system, they can prove to be an effective primer in formulating a customised methodology suiting a particular financial system. However, most of these methods are targeted more towards the identification of systemically important institutions rather than an assessment of overall systemic risk. They are also based squarely on changes in equity prices. But the challenge in dealing with systemic risk lies not only in developing tools, measures and indicators that can identify if an individual institution or a group of institutions are likely to experience a shock, but also in developing methodologies that can assess systemic linkages. With regards to indicators for institutional level shocks, a post crisis IMF (2009 a) study found that *while measures of leverage contained information useful for predicting intervention, capital adequacy ratios and liquidity ratios did not. Other indicators, including non-performing loans, return-on-equity and equity prices, also did not seem to be informative about the likelihood that a firm would require government support.*[9] It is therefore imperative that a wise mix of traditional indicators together with advanced credit risk models should be calibrated for predicting stress in institutions. The other area in the study of systemic risk, that of ascertaining systemic linkages has gained immense prominence currently. This essentially helps in establishing methods that can possibly determine propagation channels and the probable *domino effects*. IMF (2009b) surveys a number of methods to assess inter linkages between financial firms and distinguishes between four approaches. These are (a) The *network approach*, which tracks the transmission of financial stress across the banking system via linkages in the interbank market *(a further note on Financial Networks and Systemic Risk Management is detailed in Box 5.3 in the current chapter)* (b) The *co-risk model*, which uses market data on credit default swaps to assess how the default risk of an institution is affected by the default risk of another institution (c) The *distress dependence matrix*, which allows analysts to study a group of financial institutions and to assess the probability of distress for a pair of institutions, taking into account a set of other institutions and (d) The *default intensity model*, which captures the likelihood of default of a large fraction of financial institutions through linkages. In spite of this, there is presently no universally accepted indicator or quantitative framework that can exclusively measure systemic risk. Although considerable progress has recently been achieved, even the most sophisticated tools so far only account for a certain 'form' of systemic risk, and often rely on narrow definitions of a systemic event. Past experiences of financial fragility, financial booms and financial crisis, suggests that problems rarely appear at the same place in the financial system twice in a row. Part of what turns an initial spark into a fully fledged crisis is that it has not been expected by market participants and regulators. In the light of this, the need is to calibrate a method that can estimate systemic risk by focusing on monitoring traditional indicators of financial soundness, measuring inter linkages between financial institutions and changes in the behaviour of prices of financial assets.

time[10] . To each dimension corresponds a source of system-wide financial distress - procyclicality of the financial system in the time dimension and common exposures and inter-linkages in the cross-sectional dimension.

5.43 Both these aspects are sought to be addressed through the slew of policy reforms being put in place internationally. The BCBS proposals include capital buffers that are built up in good times and can be drawn

[8] What is Systemic Rick Today ? Oliver De Bandt and Philip Hartmann

[9] Defining and measuring systemic risk-Stefan Gerlach

[10] "Implementing a macroprudential framework: Blending boldness and realism", Claudio Borio, BIS, July 2010

down in periods of stress. Proposals for the introduction of expected loss provisioning aim at basing loan loss provisions on methodologies that reflect expected credit losses in loan portfolios over the life of the portfolio and are expected to address concerns related to the potential procyclicality inherent in current provisioning requirements. Proposals relating to capital incentives for banks using CCPs for derivative products and higher capital requirements for trading and derivative activities and for complex securitisation, OBS and inter-financial sector exposures are aimed at mitigating the risks arising out of interconnectedness between global firms.

Macroprudential policy in India warrants careful calibration

5.44 A Committee on Global Financial Systems (CGFS) survey[11] found the use of macroprudential instruments and a macroprudential policy framework more prevalent in emerging economies like India. In fact, in India, macroprudential indicators have been monitored periodically since March 2000. A number of specific macroprudential policy tools including provisioning and risk weights were pre-emptively and proactively used, especially during the last decade. These were discussed in the previous FSR. More recently, several measures have been put in place to tighten prudential norms for housing loans, as discussed in Chapter IV of this Report.

5.45 In India, the use of a macroprudential toolkit has achieved reasonable degree of success in countering the potential adverse impact of asset price fluctuations and high credit growth in some sectors on banks' balance sheets. However, important issues need to be addressed if the effectiveness of such policies is to be sustained. As observed by the aforesaid CGFS report, "*Many open issues remain in the development of a full-fledged macroprudential framework that delivers the promise of more effective stabilisation policy. Some of the issues are empirical, while others relate to operationalisation.*"

Difficulties in identifying a reliable indicator for calibrating countercyclical policy

5.46 Leaning against the cycle, as is required by any macroprudential policy framework, places heavy demands on analytical abilities to identify the build up of financial risks and more so in EMEs where the quality of financial data may require considerable improvement. The inadequacy of the preferred metric i.e. the deviation of credit to GDP ratio from its long term trend, particularly in EMEs is discussed in paragraph 5.16 of this Chapter. The ultimate diagnosis of macroprudential risks and the design of a macroprudential policy framework will therefore have to rely on an element of judgement and discretion. The framework being proposed internationally is also flexible enough to allow national discretion to suit the country situation in a "comply or explain" framework. There will, however, remain critics, especially in a political economy context, advocating the use of a rule-based approach so as to ensure a predictable and transparent policy framework.

Data gaps complicate assessment of the state of the economy

5.47 Bridging data gaps – to facilitate the identification of risk concentrations / vulnerabilities analysis and /or understanding how contagion from one institution can spread to other institutions - is critical if any macroprudential policy framework is to be successfully calibrated. Multi-pronged efforts are ongoing internationally to identify gaps in availability of data for the identification of systemic linkages and risks. In India too, these data gaps are likely to be significant especially outside of the scheduled commercial banking sector, where the information systems have been organised up to a level and are improving continuously due to adoption of new technology. The gaps in the Indian context will need to be revisited once the international efforts in this direction have crystallised.

Systemic interconnectedness

Inter-linkages in the financial system need to be identified and monitored

5.48 As discussed in paragraph 5.42 of this Chapter, the cross sectional dimension of macroprudential policy emphasises the criticality of inter-linkages in the financial system. As the recent crisis demonstrated, the consequences of an intertwined and highly interconnected financial system mean that the consequences of any disturbance are particularly hard

[11] "Macroprudential instruments and frameworks: a stock taking of issues and experiences", CGFS, BIS, May, 2010

to predict. This has underscored the importance of developing strong analytical methods that help better identify, monitor and address systemic linkages. Network analysis is one such tool[12] (Box 5.3).

Box 5.3: Financial Networks and Systemic Risk Management

When the news of the outbreak of a new strain of influenza virus, *H1N1*, broke in April 2009, the world was gripped with previously unseen fear psychosis. This coupled with certain rumours about the virus, made the resulting illness assume pandemic proportions. By the time when the World Health Organisation officially announced the end of the pandemic in August 2009, *H1N1* had already caused huge economic loss to the world. However, deaths due to the virus were about eighteen thousand, which is approximately only 4 per cent of annual influenza deaths in the world. In a strikingly similar fashion, the news of Lehman Brothers filing for chapter 11 bankruptcy in a New York courtroom in September 2008, spread like wildfire causing banks and other financial institutions to hoard liquidity and stopping them from lending to other banks and institutions suspected to be *infected.* Businesses, that till the evening before partied with each other, suddenly lost faith and banks started to fall like ninepins. The macroeconomic impact of these events were huge, yet in the final reckoning, the direct losses from Lehman's failure seem likely to be relatively modest with net payouts on Lehman's CDS contracts amounted to only around $5 billion. These similarities can be summarised as such. *An external event strikes. Fear grips the system which, in consequence, seizes. The resulting collateral damage is wide and deep. Yet the triggering event is, with hindsight, found to have been rather modest*[13]. The behavioural pattern of complex adaptive networks was clearly demonstrated in both the cases. The networks are complex because the interconnections involved among the agents are massive and adaptive because while the agents in the networks always wants to be in an optimal position, yet they are mostly confused or are not fully informed.

With this in the background, the world now sees with an altogether different perspective, the importance of interconnectedness that exists between banks and other financial institutions and how the financial linkages can act as a channel for propagation of shocks. Subsequently, a new field of study called Financial Network Analysis has emerged and has gained much prominence. A financial network can be typically defined as a collection of nodes which can be Banks and other Financial Intermediaries and the links in the form of credit and financial relationship that exists between them. These links, which are called *in-degrees* that represents obligations from others and *out-degrees* that represents a financial entity's obligations to others, affects the nodes and the structure of the links affect the performance of the system as a whole. Financial network analysis tries to make use of advancements achieved in the field of pure science as well as various social sciences and apply those tools and mechanism to study patterns in the financial system. In the practical world, an elaborate combination of claims and obligations that links the balance sheets of various financial intermediaries forms into a financial network. Allen and Gale (2000) have extensively analysed the spread of contagion due to direct inter linkages of balance sheets in the financial system using a simple four bank model. They derive that when the network is complete, with all banks having exposures to each other in such a manner that the amount of interbank deposits held by any bank is evenly spread over all other banks, the impact of a shock is readily attenuated. Every bank takes a small 'hit' and there is no contagion. By contrast, when the network is 'incomplete', with banks only having exposures to a few counterparties, the system is more fragile. The initial impact of a shock is concentrated among neighbouring banks. Once these succumb, the premature liquidation of long-term assets and the associated loss of value bring previously unaffected banks into the front line of contagion.[14] The study of causal chains of network interconnections with nodes taken to be 'agents' with capacity for rule based behaviour or fully fledged autonomous behaviour that represents financial intermediaries and also regulatory authorities, constitutes the new framework of financial network modelling. The contractual obligations between financial intermediaries, intermediaries and end users that determine bilateral flows of payoffs constitute pre-existing network structures while an actual crisis with default of counterparties can trigger further contingent claims such as on derivative obligations and also large losses at default due to collapse in asset markets. Thus, interactions of agents produce system wide feed-back loops. In agent based models, these need not be restricted to pre-specified equations which have to be estimated using past data in econometric or time series approaches. The main drawback of equation oriented analyses is that structure changes from strategic behaviour and tracing of causal links and influences of feedback loops on individual decisions are almost impossible to do. Hence, it is argued that agent-based ICT embedded in fine grained data based driven digital maps of the structural interconnections of financial markets should be developed as the starting point of stress tests and scenario analysis especially in the context of the policy design. The presence of highly connected and contagion causing players typical of a complex system network perspective is to be contrasted with what economists regard to be an equilibrium network. The drivers of network formation in the real world are different from those assumed in economic equilibrium models. In terms of propagation of failure, however, it is not true that financial systems where no node is too interconnected (as in a random network) are necessarily easier to manage in terms of structural coherence and stability. This suggests the need for caution in espousing an ideal network topology for financial networks[15].

[12] IMF, "Assessing the Systemic Implications of Financial Linkages", Global Financial Stability Report, April 2009; ECB, "The Concept of Systemic Risk", Financial Stability Review, December 2009 and "Financial Networks and Financial Stability", Financial Stability Review, June 2010

[13] Rethinking the Financial Network- Andrew G Haldane, April 2009

[14] See Prasanna Gai and Sujit Kapadia, 'Contagion in Financial Networks'

[15] Sheri Markose, Workshop on Financial Network Analysis, Reserve Bank of India, August 2010

A range of policy levers used to limit inter-connectedness in India

5.49 In India, a mix of policy measures, prescribed well before the crisis seeks to limit interconnectedness. These measures, *inter alia*, include prudential limits on inter-bank liabilities for banks, restricting the overnight un-collateralised funding market only to banks and primary dealers with ceilings on exposures, limits and higher risk weights on investment by banks in subordinated debt of other banks, limits on exposures between banks and NBFCs and mandated CCP arrangements in critical markets.

Systemic importance of participants varies when examined in different dimensions

5.50 An attempt to identify large and interconnected banks in India was made using data in respect of payment and settlement systems for the quarter ended June 2010 and in respect of balance sheet size and interbank liabilities as on June 30, 2010.

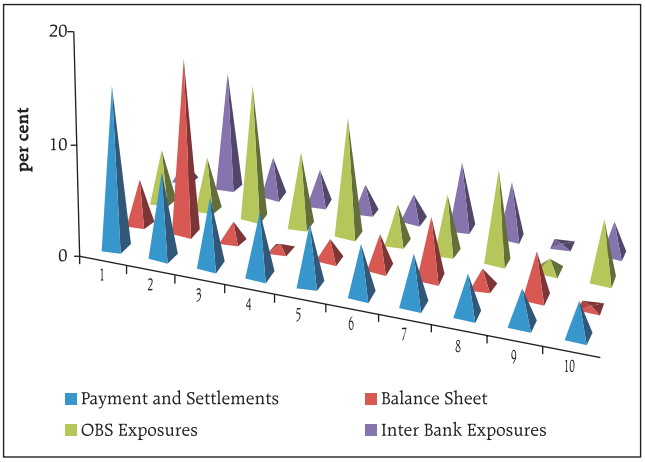
5.51 The analysis indicates that the systemic importance of participants may be very different when examined through different dimensions viz., payment and settlement systems, balance sheet size, OBS exposures and interconnectedness through interbank exposures (Chart 5.1 and Table 5.1).

5.52 The above analysis underscores the importance of taking into consideration different indicators / markets /balance sheet and OBS aspects while drawing conclusions in respect of systemic importance of financial institutions. An approach which subjects financial institutions/banks to more intense supervision based only or largely on size parameters may result in overlooking other institutions which are more interconnected, for example through payment systems or through the inter-bank markets.

REGULATORY ARCHITECTURE

5.53 Efforts to strengthen system-wide oversight and macroprudential policy arrangements are taking place at national as well as the international levels. Legislative changes in various countries are being affected to explicitly task an agency/agencies with the responsibility of macroprudential supervision and management of systemic risk. The significant amendments to the regulatory and oversight

Chart 5.1: Share of Top 10 Payment & Settlement System Participants in Aggregate Balance Sheet, OBS Exposures and Interbank Exposures of Scheduled Commercial Banks



Source: RBI, CCIL

Table 5.1: Ranks of Top 10 Payment & Settlement System Participants in Aggregate Balance Sheet, OBS Exposures and Interbank Exposures of Scheduled Commercial Banks

Payments And Settlements	Balance Sheet Size	OBS Exposure	Inter Bank Exposure
1	6	9	17
2	1	8	2
3	19	1	8
4	40	5	9
5	20	2	13
6	11	12	14
7	3	7	4
8	22	3	5
9	8	17	39
10	51	6	11

Source: RBI, CCIL

architecture have involved, one or more of the following in various jurisdictions,

- Designating the central bank as the systemic regulator with accountability;
- Placing central banks in charge of microprudential regulation, where not already so, in addition to macroprudential regulation, especially with respect to systemically important financial institutions; and
- Setting up financial stability councils/commissions to provide high level focus on financial stability.

FSDC – a macroprudential authority for India

5.54 In India, the Reserve Bank has been implicitly discharging the functions of a systemic regulator. The previous FSR had pointed out the synergies drawn from the fact that the Reserve Bank was the monetary authority, the lender of last resort and the regulator and supervisor of banks, NBFCs and critical financial markets. Post crisis, the Union Budget 2010 has announced the establishment of a high-level Financial Stability and Development Council (FSDC) with a view to strengthen and institutionalise the mechanism for maintaining financial stability. The FSDC is taking shape and it will have one sub-committee to be headed by the Governor of the Reserve Bank. The Reserve Bank's role in it would expectedly be critical.

Legislative reforms – to be driven by policy direction

5.55 The Union Budget proposed the setting up of a separate Financial Sector Legislative Reforms Commission to rewrite and clean up the financial sector laws to bring them in line with the requirements of the sector. The decision is timely and very vital as the current statutory arrangements comprises of laws of varying vintage governing different segments of the financial industry. The statutory arrangement has served the system well by helping maintain an orderly banking system. However, there is a strong case for reviewing all the various legislations and recasting them for a number of reasons including integration of various statutes so as to provide clarity and transparency and building in of provisions which include the lessons from the global financial crisis and the imperatives of financial stability. Any revision to legislations in the banking and financial sector will, however, need to be driven by clear policy direction for the banking and financial industry.

The non-banking financial sector in India – tightening the regulatory norms

5.56 It is now well recognised that, before the crisis, a whole network of bank-like institutions - now called the 'shadow banking system' - grew and flourished outside the regulatory regime of banks. When the systems began to unravel, it was realised that many of these institutions in the shadow banking system posed significant systemic risk.

5.57 In the Indian context, the 'shadow banking system', as it existed in much of the developed world is largely irrelevant. Most of the non-banking financial system is regulated. NBFCs are regulated by the Reserve Bank under the sections of Chapter IIIB, IIIC and V of RBI Act, 1934. They are also required to comply with relevant provisions of Companies Act, 1956 (being companies) and SEBI regulations. The Reserve Bank's regulatory perimeter extends to financial entities accepting public deposits and those non-deposit taking financial entities involved in asset financing, providing loans and investments. The regulatory and supervisory architecture is, however, geared towards systemically important non-deposit taking entities (with asset size ₹ 100 crore and above) with the supervisory framework for other non-deposit taking entities being limited.

5.58 Certain categories of entities carrying out NBFI activities are exempted from Reserve Bank regulation by virtue of them being regulated by another regulator viz., HFCs, mutual funds, insurance companies, stock broking companies, merchant banking companies and venture capital funds (VCF), which are regulated by the respective sectoral regulators.

5.59 The above regulatory framework gives rise to two sets of issues which could engender possible regulatory gaps. The first set of issues pertains to a need to plug gaps and tighten regulatory controls for the entities regulated by the Reserve Bank. These are discussed in paragraphs 5.60 to 5.61 of this Chapter. Another set of issues arise in the context of functional activities being unregulated due to the present system of entity regulation. These are discussed in paragraphs 5.62 to 5.66 below.

A calibrated regulatory framework for Reserve Bank regulated entities established

5.60 In case of Reserve Bank regulated entities, a gradually calibrated regulatory framework was created.

This has been discussed in previous FSR. In recent months also, several steps have been taken to strengthen the prudential requirements applicable to NBFCs so as to strengthen the regulatory framework of the sector and to plug regulatory gaps, if any.

NBFCs vis-a-vis banks – a few avenues for regulatory arbitrage remain

5.61 Some concerns nevertheless remain especially in the context of the rapidly expanding NBFC sector. The entry point norms for NBFCs (presently net owned funds of ₹ 2 crore) is low as compared to that of banks (presently ₹ 300 crore), which along with the relatively lighter touch regulation makes setting up of an NBFC a more attractive option. NBFCs are not subject to any restrictions regarding investment in the capital market thereby leading to enhanced market risk; nor do they have any restrictions on setting up of subsidiaries, thereby allowing setting up of possibly opaque structures with concomitant transparency issues. Further, quality of corporate governance and management can give rise to serious concerns. Another issue arises in the context of definition of an NBFC in terms of its "principal business" which makes it possible for an NBFC to conduct some other non-financial activity by deploying funds in non-financial assets, leading to a lack of level playing field vis-a-vis banks. A Working Group is being constituted to look into all this issues comprehensively.

Regulatory gaps permitting surrogate raising of deposits need to be plugged

5.62 NBFCs are exempt from the provisions of Section 67 of the Companies Act, 1956, in terms of which issuance of shares / debentures to more than 49 investors needs to be through public issuance. This means that NBFCs, particularly those not regulated by the Reserve Bank, could issue debt or quasi-debt instruments to a large number of retail/institutional investors on a private placement basis. This would be tantamount to raising public deposits outside the extant regulatory framework.

5.63 Specific concerns in this regard have arisen in the past in the context of private placement of Convertible Preference Shares (CPS) by few NBFCs. The Reserve Bank is in the process of formulating guidelines in conjunction with the Ministry of Corporate Affairs to plug this regulatory gap.

Prudential regulation of leveraged activities by entities not regulated by the Reserve Bank is warranted

5.64 Certain NBFCs, coming under the purview of other regulators, have been exempted from the regulatory purview of the Reserve Bank subject to certain conditions. For instance, merchant banks have been exempted subject to the condition that they acquire securities only as a part of its merchant banking business; do not carry on any other financial activity referred to in Section 45I(c) of the RBI Act, 1934 and do not accept or hold public deposits. However, this has given rise to instances of certain functional activities of some exempted NBFCs remaining unregulated, viz.,

- Merchant banks also undertake fund based activities such as providing margin financing to clients and undertaking proprietary trading especially in the context of their underwriting business and consequent devolvement on them. They also undertake other investment activities that could, but for the above exemption, require registration with the Reserve Bank.

- Merchant banks, portfolio managers and brokerages also issue structured products like Equity Linked Debentures (ELDs) to their high net worth clients. Being financial market intermediaries, any leverage on the books of these entities needs to be prudentially regulated.

5.65 Appropriate action for addressing the above issues is being contemplated by the Reserve Bank in consultation with SEBI.

5.66 Another regulatory gap which existed in the extant regulations for non-convertible debentures (NCDs) issued by NBFCs (and also corporates) has recently been plugged by mandating that NCDs with a maturity of 90 days and more cannot have call/put options that are exercisable within 90 days from the date of issue[16].

[16] http://www.rbi.org.in/scripts/NotificationUser.aspx?Id=5743&Mode=0

Microfinance institutions (MFIs) – recent concerns warrant closer examination

5.67 Of late, a gamut of issues related to the regulation of MFIs in the country have emerged in the wake of the controversy generated by the Ordinance passed in the state of Andhra Pradesh to regulate money lending transactions and ensure transparency of operations. The concerns include, *inter alia*, charging high interest rates, coercive recovery practices and malpractices in lending such as multiple lending, ever-greening of loans and lending beyond the debt sustainability of households. The aforesaid publicity has also affected the operations of the MFIs, especially in the state of Andhra Pradesh. Fresh disbursements have come to a standstill while the recovery rate of the NBFC-MFIs has come down sharply. The impact of non-recovery of MFI loans spilling over to other states and to other channels, including bank lending through SHGs, cannot be ruled out. This needs to be carefully monitored given MFIs have emerged as important agencies fostering greater financial inclusion in the country. The Reserve Bank has set up a Committee to look into the aforesaid issues.

Presence of foreign banks in India – issues and concerns

5.68 An issue where there is vigorous debate internationally relates to the nature of incorporation of foreign banks. The advantages of domestic incorporation of foreign banks i.e. subsidiarisation, include potentially better regulatory control over such banks, clearer separation of ownership from management, a clearer and simpler resolution in the event of bankruptcy and a more effective ring fencing of capital within the country. However, financial stability concerns warrant that, while opting for subsidiarisation, the pitfalls of dominance of the domestic financial system, particularly the banking system, will have to be kept in view. The evidence from other countries suggests that where subsidiaries promoted by foreign banks had a large presence, they tended to acquire a large share at the expense of domestic banks in the boom years. But when the home countries were afflicted, they tended to substantially curtail their operations in or withdraw from, the host country. The Indian experience in this regard has been no exception as the foreign banks were found to have withdrawn substantially from the credit markets in India during the crisis years with negative advances growth rates in 2009-10 (as discussed in Chapter IV of this Report).

5.69 A gamut of issues arises in this context viz., (i) Should subsidiaries be given full national treatment by virtue of their local incorporation? If not what should be the nature and extent of restrictions? (ii) Should the subsidiary form of presence be mandated for all new entrants or should it be selectively applied based on certain parameters? and (iii) What approach should be adopted towards the existing branches of foreign banks – whether incentives should be provided to them to convert into subsidiaries? All of these issues will require careful consideration.

PAYMENT AND SETTLEMENT SYSTEMS

5.70 The smooth operation and resilience of the payment and settlement infrastructure of a country and of the global financial systems not only contribute to financial stability but are in fact a precondition for it. Financial infrastructure, functioning through interconnectedness in financial systems, may act as contagion channels affecting stability of institutions, markets and the smooth functioning of the financial infrastructure itself[17].

Regulatory architecture

A robust regulatory architecture for payment and settlement systems is in place

5.71 In India, the operations of payment and settlement systems are driven by the objectives of safety; security; soundness (robust); efficiency; accessibility (including the challenge of financial inclusion); and that all payment systems are duly authorised as spelt out in mission statement in "Payment Systems in India Vision 2009-12 (July-June)".

5.72 The Reserve Bank is tasked with the regulatory oversight of the payment and settlement systems in the country. The legal framework for the oversight role of the Reserve Bank is provided by the Payment and Settlement Systems (PSS) Act, 2007 and the Payment and Settlement System Regulations, 2008 framed thereunder. Given the criticality of smoothly functioning financial infrastructure, a Committee of the

[17] "A Framework for Assessing Systemic risk", Miquel Dijkman, World Bank Policy Research Working Paper 5282, April 2010

Board of the Reserve Bank – the Board for Payment and Settlement Systems has been entrusted the responsibility for focused regulation and supervision of payment and settlement systems in the country.

5.73 Since the enactment of the PSS Act, 2007, all payment systems (except stock exchanges and clearing corporations of stock exchanges) operating in the country are required to seek authorisation from the Reserve Bank. An oversight mechanism has since been put in place with focus on offsite surveillance to be supplemented by need based onsite inspection. This is complimented by an effective market intelligence network.

There are, however, some gaps in regulatory perimeter

5.74 While the above regulatory architecture has provided a sound legal basis for the regulation and supervision of payment and settlement systems in the country, some payment systems remain outside the purview of the PSS Act. In terms of Section 34 *ibid* of the PSS Act, 2007, the provisions of the Act do not apply to stock exchanges and clearing corporations set up under stock exchanges (viz., the National Securities Clearing Corporation of India and the Indian Securities Clearing Corporation).

Operational performance of the payment and settlement systems

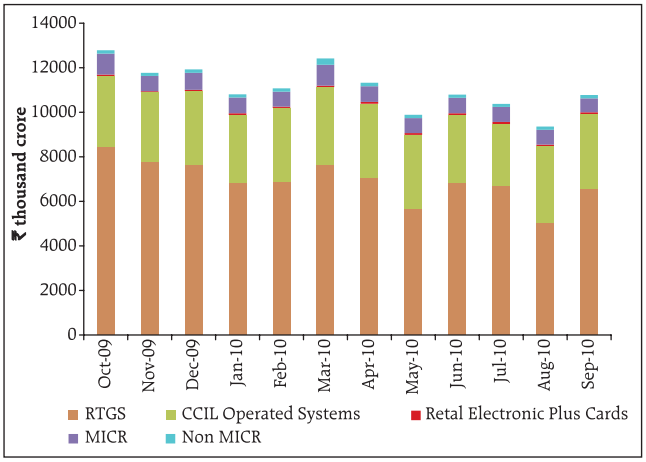
Operational Performance remains robust

5.75 The operational performance of the payment and settlement infrastructure in India continues to be robust. Transaction volumes grew by nearly 2 per cent in the half year ended September 30, 2010, while there was a decline in transaction value by around 12 per cent (Charts 5.2 and 5.3).

Progress in migration to electronic clearing modes continued

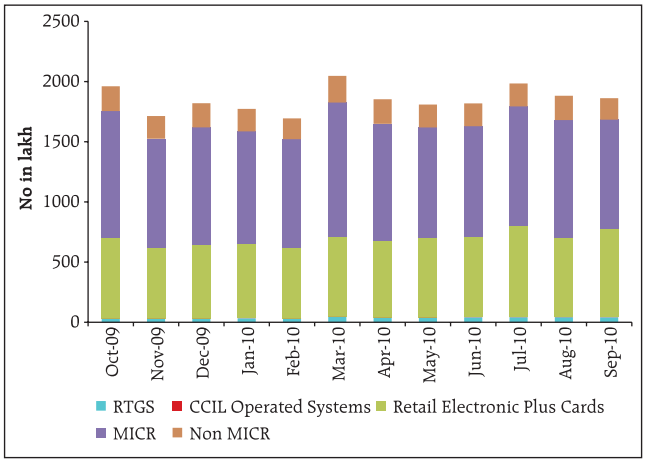
5.76 Critically, the share of the arguably more efficient and secure electronic transactions continued to grow (Chart 5.4). During the half year, a strong impetus to the migration of large value transactions to electronic settlement was provided by the cessation of high value clearing (i.e. same day clearing of local cheques of ₹1.00 lakh and above which was operational in 30 centres) with effect from April 01, 2010.

Chart 5.2: Trends in Value



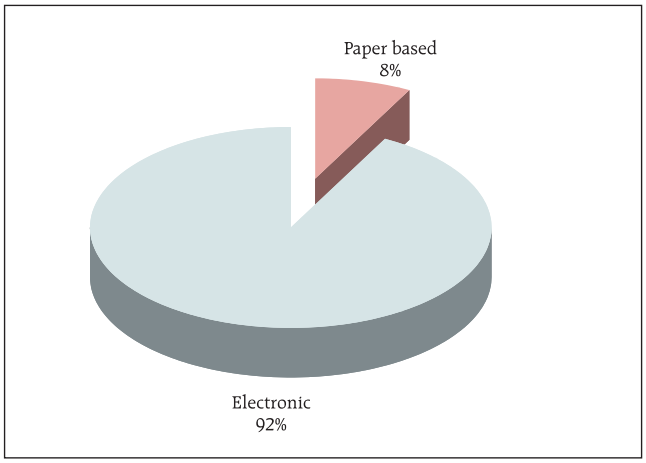
Source: RBI

Chart 5.3: Trends in Volume



Source: RBI

Chart 5.4: Share of Electronic and Paper Based Systems in Payment Transactions: Value

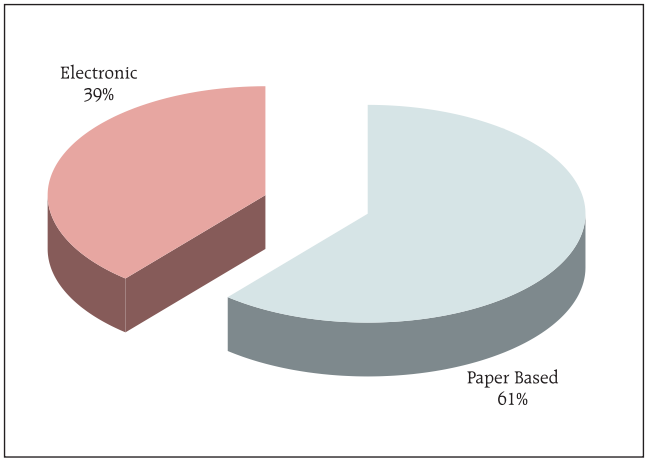


Source: RBI

Continued high volumes in paper clearing and a large network of clearing houses present challenges for robust risk management

5.77 In terms of volume, however, the share of paper based transactions, at 61 per cent during the half year ended September 30, 2010, continued to be large (Chart 5.5). These transactions, though largely of small individual value, nevertheless comprise a significant chunk of total transactions and could potentially be a source of systemic risk as also pose concerns from the customer and depositor protection perspective. However, several measures – mandating electronic clearing for all transactions above ₹10 lakh and measures to place settlement finality on a sounder legal footing - taken in recent years have mitigated this risk to a great extent.

Chart 5.5: Share of Electronic and Paper Based Systems in Payment Transactions: Volume



Source: RBI

5.78 Given that migration of a larger share of payment transactions to electronic payment modes involve significant challenges related to, *inter alia*, the geographic expanse of the country and the social habits and psyche of the participants, the Reserve Bank has been initiating a number of efforts aimed at enhancing the efficiency of paper based clearing systems. These, *inter alia*, include a phased introduction of the Cheque Truncation System, standardisation of cheque forms being used by banks and enhancement of security features in cheque forms and introduction of speed clearing.

5.79 Paper transactions in the country are cleared and settled through a large network of 1150 clearing houses across the geographic expanse of the country. Certain difficulties involved in managing such large network of clearing houses with a view to ensuring robust risk management standards are sought to be addressed through the prescription of the Uniform Regulations and Rules for Bankers' Clearing Houses, Minimum Standards of operational efficiency for MICR and non-MICR clearing houses and self-assessment at periodic intervals. The clearing houses are subject to oversight.

Operational Risk in payment and settlement systems

Operational risks closely managed and vulnerabilities monitored

5.80 Operational disturbances in the functioning of payment and settlement systems may impede timely

processing of financial market transactions and result in liquidity and other difficulties and could be a powerful contagion for financial instability. The Core Principles for Systemically Important Payment Systems also emphasise the operational reliability of critical financial market infrastructure and enunciate that "*The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing*".

5.81 Management of operational risks in payment and settlement systems has been engaging the attention of the Reserve Bank for some time. To test the business continuity capabilities of critical payment system applications, it has been conducting periodic disaster recovery drills. Three such drills were successfully conducted since the publication of the previous FSR.

5.82 The majority of critical payment and settlement systems in the country ride on the backbone provided by the Indian Financial Network (INFINET) which is hosted by the Institute for Development and Research in Banking Technology (IDRBT). The INFINET could therefore potentially constitute a single point of failure. The consequent vulnerability is sought to be addressed through building up of adequate redundancies including sourcing the telecommunication network from two service providers.

5.83 The INFINET is designed as a closed user group. This is a critical factor which ensures security of payment and settlement systems from intrusion. However, given the potentially huge impact of any unauthorised intrusion on such systems, periodic vulnerability assessment and penetration testing is an important safeguard to prevent any disruptions to the operations of these systems.

Systemically important payment systems

Large value transactions on Real Time Gross Settlement (RTGS) or deferred net settlements

5.84 Migration of all large value payments to a real time gross settlement system or to settlement on a secured deferred net settlement basis through a CCP and of securities settlement systems to a delivery versus payment mechanism has to a large extent mitigated risks of disruptions to the functioning of the financial market infrastructure in the country. As mentioned above, these payment systems have been functioning smoothly and with minimal disruptions.

Secured deferred net settlement systems in critical markets ensure economic use of liquidity

5.85 In India, the development of large value payment systems has been guided with a view to enhance both security and efficiency. Settlement of all large value transactions in the RTGS system carries with it the benefits of a secure gross settlement system while the liquidity saving benefits of netting are derived through secure deferred net settlement of critical interbank markets (Table 5.2). At present, in India, the settlement of transactions relating to government securities, market repos, Collateralised Borrowing and Lending Obligation (CBLO) and foreign exchange (spot and forwards) are settled on a guaranteed net settlement basis through CCIL. For the capital market, the major stock exchanges viz., National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) also have their own CCPs (National Securities Clearing Corporation and Indian Securities Clearing Corporation Limited respectively).

Comfortable liquidity position in the RTGS system

5.86 Data regarding usage of intra-day liquidity (IDL) offered by the Reserve Bank (Table 5.3) also indicates that the liquidity position in the payment system is comfortable.

Table 5.2: Netting Efficiency

	G-Sec (Funds) (%)	Forex (%)
2008-09	84.43	94.42
2009-10	82.96	94.07
2010-11 (*)	79.89	95.16

(*) Up to Sep 2010
Source: CCIL

Table 5.3: Usage of Intra-day Liquidity

	IDL(*)
Quarter ended Mar 2010	2.11
Quarter ended Jun 2010	2.67
Quarter ended Sep 2010	3.55

(*) IDL usage as a per cent of total transactions
Source: RBI

Concentration risks in systemically important payment and settlement systems evidenced

5.87 An analysis of transactions in the RTGS and CCIL operated payment systems indicated that the largest participant accounted for 15 per cent of all receipt and payment transactions (Chart 5.6). A significant degree of concentration was also witnessed in the transactions share accounted for by the top five participants, indicating a high degree of interconnectedness in payment and settlement systems.

5.88 This is also demonstrated through the measure of node risk[18] i.e.

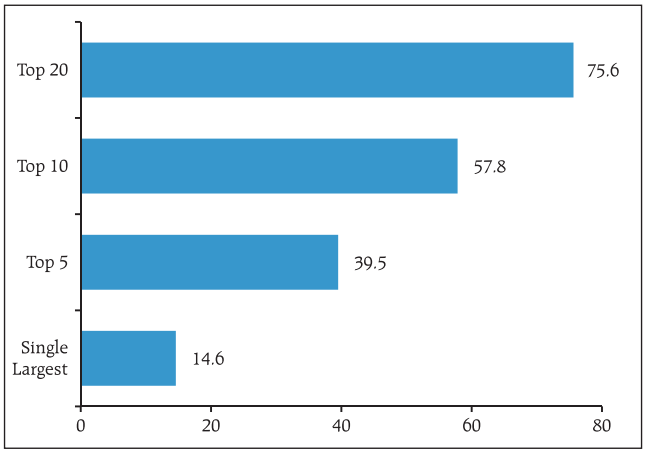
$$(\text{Node risk})_x = \frac{(\text{Payment made})_x + (\text{Payments received})_x}{\text{Total Payments made}}$$

The index value for the five most active banks in the system equals approximately 78 per cent with the most active participant accounting for about 30 per cent. The average risk index for the other banks is much smaller suggesting that nearly 80 per cent of the payment activity would be at risk if the five most active banks experience difficulties.

5.89 Similar concentration was observed in CCIL transactions wherein transactions were concentrated in a few foreign banks (five largest participants were all foreign banks). Such concentration of trades is a clear pointer to trends in the underlying market and indicates that despite significant growth in transaction volumes, market participation remains skewed. (Charts: 5.7 – 5.10).

Chart 5.6: Concentration in Payment Systems

(per cent)



Source: RBI, CCIL

Chart 5.7: Share in Outright G-Sec Trades

(per cent)

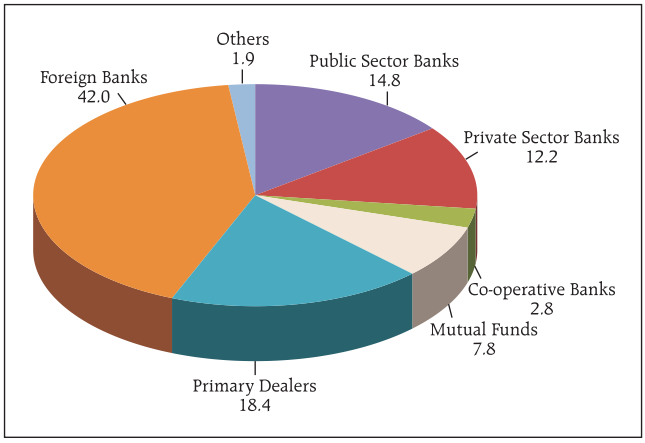
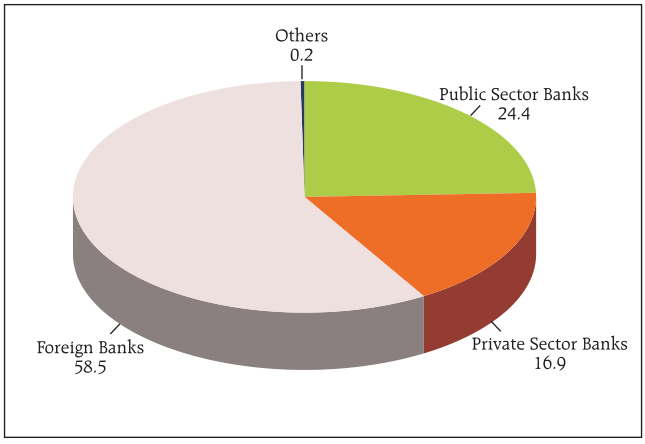


Chart 5.8: Share in Outright Forex Trades

(per cent)



Source: CCIL

CCP arrangements

CCPs emerging as the preferred mode for settlement globally

5.90 In the wake of the financial crisis, the role of CCPs in contributing to minimising systemic risk has been increasingly realised. By reducing bilateral interconnectedness between major financial institutions, CCPs make an important contribution to limiting contagion risk in the financial system. The presence of CCPs also ensures that trades are

[18] Each node represents a participant in a payment and settlement system with the participant making payments to other participants as also being the recipient of payments from other participants.

collateralised. In fact, it typically recalculates new collateral requirements on a daily (or more frequent) basis. This represents a significant improvement from the current position internationally – accordingly to an International Swaps and Derivatives Association (ISDA) survey, only 23 per cent of bilateral trades are collateralised while the position about the remaining 77 per cent is unclear. Finally, a CCP contributes to systemic stability through enhanced transparency, for example, through periodic dissemination of trade related information.

CCPs are not, however, a panacea for all deficiencies/ risks

5.91 But, as has also been realised, CCPs are not a panacea for all products and for all markets. In particular, CCP arrangements result in the concentration of counterparty risks in one entity. In case of a sufficiently large CCP, this concentration risk can become systemic and the impact of the failure of such a CCP could be potentially worrying. It is therefore imperative that the risk management standards in a CCP, including the legal framework of its operation, be robust and that the CCP be subject to close oversight. Internationally, the regulatory structure of a CCP needs to be applied on a consistent basis across borders so as to pre-empt scope for regulatory arbitrage and a potential erosion of risk management standards. The Recommendations for Central Counterparties[19], currently being reviewed by the Committee for Payment and Settlement Systems (CPSS) and the International Organisation for Securities Commission (IOSCO), will attempt to address these issues.

CCPs – the preferred settlement mechanism for many large value transactions in India

5.92 In the Indian case, the guaranteed settlements have been the preferred mode of settlement for large value interbank transactions, wherever feasible. In the money and government securities markets, the Reserve Bank facilitated the establishment of the CCIL. CCIL has been brought within the purview of the PSS Act and is subject to close oversight. A few concerns in the CCP arrangements in the country remain.

Chart 5.9: Share in Outright MIFOR Swaps

(per cent)

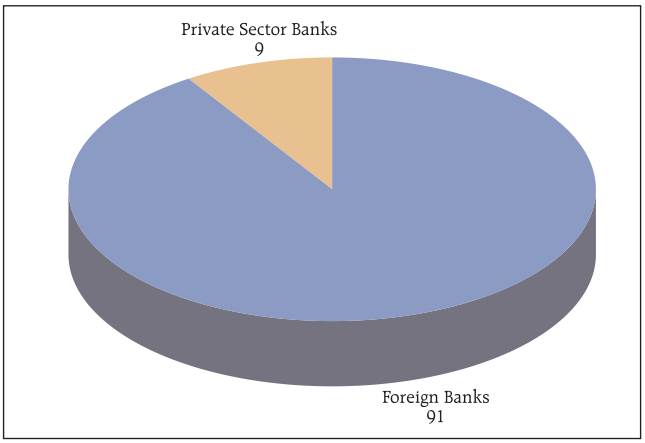
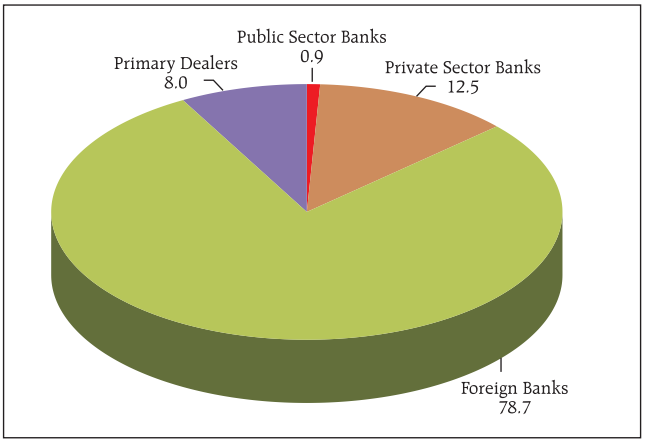


Chart 5.10: Share in Outright MIBOR Swaps

(per cent)



[19] http://www.bis.org/publ/cpss64.htm

The design of CCIL as a multi product CCP presents challenges while offering economies of scope and scale

5.93 The design of CCIL, as it has emerged, is that of a single CCP functioning in multiple markets/products. This design brings with itself a number of benefits in terms of economies of scale and scope. It also reduces overall operational costs and access fees for the participants.

5.94 However, the design also implies that the CCIL's network of counterparty exposures widens. In the Indian context, this is especially critical as the same participants operate in different market segments. The model also brings to the fore, challenges in respect of management of the aggregate risk exposure of the CCP and makes it difficult to estimate the impact of tail events. Assessment of the adequacy of the CCP's default fund and the efficacy of its loss absorption system hence becomes difficult. The operational risks associated with such an entity are also commensurately large. A recent report by the BIS[20] concluded that "Specific market structures (for CCPs) may create specific risks and amplify interdependencies between systems and markets..... However, market structures may also have risk reduction benefits and mitigate interdependencies."

5.95 From a stability perspective, a multi-product CCP such as CCIL essentially becomes, and will need to be treated as, an entity which is systemically important. As it covers a wide range of markets and participants, the spill over effects of defaults/disturbances in any one market/product is likely to be greater. The oversight mechanism for the institution will need to factor in this aspect. The Reserve Bank, through its supervision over CCIL, attempts to ensure that it's risk management standards are robust and that they meet international best practices.

Access of the CCP to central bank liquidity remains an open issue

5.96 An important question which arises in this context is whether CCPs should have access to central bank credit/liquidity facilities. The question, in fact, remains unresolved even at the international level though a case to the effect is not difficult to build. "*... all CCPs should have access to at least a certain amount of central bank facilities. If a CCP finds itself confronted with a temporary liquidity shortage, access to intraday central bank liquidity lines could take the sting out of the tail, thereby reducing the likelihood of unnecessary financial distress*[21] ." In some jurisdictions, CCPs have been incorporated as 'limited banks' in order to ensure that they have access to central bank facilities.

5.97 Instances for the need for central bank liquidity by CCIL have not been frequent. This has largely been facilitated by a robust risk management framework, on the one hand, and by the fact that Indian financial markets functioned relatively smoothly even during periods of significant disturbances in global markets. Going forward, as Indian markets become more intertwined with global markets, market volatilities may increase CCP liquidity needs beyond margins, especially during situations of stress. Some kind of access of CCIL to central bank facilities may become necessary as CCIL has emerged as an essential market infrastructure in a space characterised by lack of competition. However, no such facility, if provided, can be automatic. CCIL should be able to meet the same (or equivalent) requirements as other counterparties enjoying central bank facilities and the facilities will need to be provided in such a manner that there is no incentive for the dilution of controls.

A few issues of concern need to be addressed.

5.98 Some issues with respect to specific segments also pose some concern in respect of the functioning of CCIL. For example, while considerable risk mitigation has been achieved by CCIL in respect of the settlement of foreign exchange transactions, there remains an element of Herstatt risk associated with such settlements, especially with respect to the US dollar leg of such settlements. In the CBLO segments, large intra day positions are assumed by the five settlement banks which cater to corporate mutual funds and some co-operative banks. This could have systemic implications in the event of failure of any settlement bank. Again, in the CBLO segment,

[20] "Market structure developments in the clearing industry: implications for financial stability", November 2010

[21] Nout Wellink, "Mitigating systemic risk in OTC derivatives markets",

counterparty risk is managed by CCIL through the imposition of a Single Order Limit (SOL). However, the SOL, as a counterparty exposure management tool, may not be as effective as a Net Debit Cap in ensuring that counterparty positions remain within acceptable limits. These issues are being examined.

Several initiatives have placed financial infrastructure on a sounder legal footing

5.99 The enactment of the PSS Act, 2007 ensured compliance with the first Core Principle for Systemically Important Payment Systems which states that "the system should have a well founded legal basis under all relevant jurisdictions". Several initiatives under the aegis of this Act have been taken recently in order to place the financial market infrastructure on a stronger legal footing.

5.100 An important soft spot in Indian payment and settlement systems was that the legal basis for the determination of settlement obligation through netting was provided through bilateral contracts and there was no recognition for multilateral settlements under law. This was addressed through the enactment of the aforesaid Act and recently amplified through issue of a directive on "Settlement and Default Handing Procedures in Multilateral and Deferred Net Settlement Systems"[22]. The directive seeks to provide certainty and predictability for the method of determining settlement obligations of the participants and the point at which the settlement of obligations is deemed final and irrevocable.

Bankruptcy of participants in systems not covered by the PSS Act could be disruptive

5.101 The PSS Act provides legal certainty for multilateral settlement arrived in payment and settlement systems authorised by the Reserve Bank under the Act. However, similar legal certainty is not in place in case of systems outside the purview of this Act viz., the equity market settlements. Further, banks are the back stop liquidity providers even for these systems. The implications arising from instances of failure to pay or bankruptcy of any participant could potentially be disruptive to the system at large.

OTC markets

Weaknesses in OTC derivative markets need to be addressed to reap the potential benefits of such products

5.102 Setting up of resilient OTC derivatives market infrastructure has been a widely shared key priority for policy makers internationally. OTC derivatives benefit financial markets and the wider economy by improving the pricing of risk, adding to liquidity, and helping market participants manage their respective risks. It is, however, important to address the weaknesses in these markets which had been instrumental in exacerbating the financial crisis. A recent FSB report on OTC derivative markets[23], made a range of recommendations aimed at achieving the objectives set out by the G20 leaders in Pittsburgh in September 2009, "*All standardised OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest. OTC derivative contracts should be reported to trade repositories. Non-centrally cleared contracts should be subject to higher capital requirements*".

5.103 The key international initiative in respect of the OTC derivative markets has been to integrate these markets into regulated and supervised market infrastructures such as trading platforms, trade repositories and CCPs. There is also a recognition that there will always remain some contracts which cannot be centrally cleared. It thus becomes imperative to enhance the safety of OTC derivatives markets e.g. through increasing transparency and by strengthening the capital requirements for bilaterally cleared trades.

OTC derivative markets in India have developed within a regulated space

5.104 In India, the OTC derivatives markets developed within a regulated framework. A menu of OTC products was introduced in the market in a phased manner commensurate with developments in the broader financial sector. The fundamental requirement for access to the derivative market remains the existence of an underlying commercial transaction or exposure. The method adopted was to improve access to simple,

[22] http://rbi.org.in/scripts/NotificationUser.aspx?Id=6018&Mode=0

[23] http://www.financialstabilityboard.org/publications/r_101025.pdf

transparent and easy to understand products. Significant success in building up a reporting platform and settlement of derivatives trades, including interest rate derivatives, through a CCP was also achieved. OTC forex and interest rate derivatives already attract higher credit conversion factors than prescribed under the Basel II framework and all exposures are reckoned on a gross basis for capital adequacy purposes.

Many challenges and some concerns remain

5.105 The participation structure in many derivative markets remains skewed with volumes concentrated in a few participants, as discussed in paragraph 5.89 of this Chapter. Volumes in some derivatives markets remain relatively low making it challenging to mandate guaranteed clearing for such products.

5.106 As new products get introduced [the most recent initiative related to the proposed introduction of single name Credit Default Swaps (CDS) products], similarly robust infrastructural arrangements will need to be put in place. But the transition phase will need to be carefully managed. For example, in the early stages of introduction of CDS, it would be difficult to mandate guaranteed settlement, as discussed in Chapter III of this Report.

5.107 A further area for regulatory initiative in the Indian markets would be greater standardisation of OTC products and introduction of central clearing arrangements for a greater number of such products. However, given the vanilla nature of products permitted in the country, standardisation of existing products may not be very difficult.

International standards for Payment and Settlement System

Globally, standards for financial market infrastructure are being reviewed

5.108 Even as efforts are ongoing to strengthen core financial market infrastructures including those related to payment and settlement system infrastructures, the importance of international standards against which the infrastructures in various jurisdictions can benchmark themselves has become critical. Accordingly, a review of the standards for financial market infrastructure viz., 'Core Principles for Systemically Important Payment Systems', 'Recommendations for Securities Settlement Systems' and 'Recommendations for Central Counterparties', has been undertaken by the CPSS and the IOSCO.

Reserve Bank remains committed to adopting international best practices, as and when finalised

5.109 The Reserve Bank strives to adopt international best practices in various areas including payment and settlements. As reported in the previous FSR, the Committee on Financial Sector Assessment (CFSA) had, *inter alia*, conducted a self assessment of the compliance of the payment and settlement infrastructure in the country with Core Principles for Systemically Important Payment Systems and the recommendations for Securities Settlement Systems and CCPs. The Committee concluded that the country was broadly compliant with the principles/ recommendations. The RTGS system in the country was also assessed by a team of experts from the Swiss National Bank at the invitation of the Reserve Bank. This external assessment also observed the system to be largely compliant with the Core Principles. As and when the revised standards are introduced, the same will be considered for incorporation in the Indian framework suitably calibrated to domestic conditions.

DEPOSIT INSURANCE

5.110 The existence of a strong deposit insurance system is an integral part of financial stability arrangements in any economy. The recent financial crisis reemphasised the fact that banks are susceptible to problems of insolvency or illiquidity and reaffirmed the need for deposit insurance in arresting a panic reaction and restoring public confidence in the banking system. The Fifth Report (2007-08) of the Treasury Committee of the House of Commons (titled "Run on the Rock") succinctly concludes that "*All banks and building societies should be covered by a deposit insurance scheme, such that, in cases such as Northern Rock, or an even larger bank, the Government would not be required to step in to protect depositors*".

5.111 Historically too, the emergence of deposit insurance has been motivated by financial stability concerns[24]. As deposit insurance matured and

[24] At the time when deposit insurance was first introduced in the United States in 1933, the main purpose was to "restore public confidence in the nation's banking system" in the wake of large scale bank failures that occurred in the 1920s and 1930s.

progressed along the value chain, consumer protection, and more specifically protection of depositors' interest emerged as the other major public policy objective of the safety net infrastructure. Principle 1 of the Core Principles of Effective Deposit Insurance System[25] states "*The principal objectives for deposit insurance systems are to contribute to the stability of the financial system and protect depositors*".

5.112 The recent financial crisis has exposed the inadequacies and weaknesses in a number of deposit insurance systems around the world and set into motion many efforts to improve the efficacy of such systems. Against the backdrop of the experiences during the crisis, the BCBS and the International Association of Deposit Insurers (IADI) jointly developed the *Core Principles for Effective Deposit Insurance Systems*, which was published in June 2009. IADI has also come out with the draft methodology for assessment of the compliance with these principles.

Deposit insurance system in India– robust but some critical issues remain

5.113 In India, DICGC was set up in 1962 thus making it the second oldest deposit insurance corporation in the world. As outlined in the first FSR, deposit insurance in India is mandatory for all banks (commercial/co-operative/RRBs/Local Area Banks (LABs)[26]. It covers all deposits except those of foreign governments, Central/ State Governments, inter-bank, deposits received abroad and those specifically exempted by DICGC with prior approval of the Reserve Bank.

5.114 Some of the key challenges faced by the deposit insurance system in India include ensuring the adequacy of the deposit insurance fund, reducing the time taken to reimburse depositors, improving the coverage of the deposit insurance system and broadening the mandate of DICGC to include bank resolution. Ensuring compliance with the Core Principles for Effective Deposit Insurance Systems would remain a challenge pending reforms in the deposit insurance system in India.

Funding of deposit insurance systems: a challenging task

5.115 Adequate funding of deposit insurance systems, typically measured through Fund Ratio / Reserve Ratio (Fund Size to Total Insured Deposits), is a critical issue for ensuring the solvency of the fund and maintaining public confidence. The Reserve Ratio for DICGC at end-March 2010 was relatively low at 0.85 per cent though there is no clear international benchmark in this regard. While no deposit insurance system can be designed to deal with systemic risk of the proportions that was witnessed during the recent financial crisis, it is important that given the contagious nature of bank failures, the deposit insurance funds factor in the possibility of several banks failing simultaneously[27]. In this context, a stress testing of the Deposit Insurance Fund (DIF) of DICGC was undertaken.

5.116 The stress tests were undertaken based on three scenarios – first, projecting claims on the basis of the average growth in claims settled during the last five years, second, estimating insured deposit of all the weak UCBs if they were to be liquidated and third, if the commercial banks which have been amalgamated (during 2003-2006) with other banks were to be liquidated. The stress tests revealed that under each of these scenarios, the DICGC would be in a position to meet the claims, although under the latter two scenarios, the reserve ratio would drop sharply.

Cross subsidisation raises the issue of moral hazard

5.117 The previous FSR discussed in detail the issue of cross subsidisation of premium in the Indian context. The extent of cross subsidisation can be illustrated by considering that in 2009-10, commercial banks contributed 93 per cent of the premium received by DICGC though no claims from the depositors of these banks were required to be settled. In contrast, the ratio

[25] http://www.bis.org/publ/bcbs156.pdf.

[26] Deposit insurance is not applicable to co-operative banks where the Cooperative Societies Act under which they are registered does not comply with the provisions of Section 2 (gg) of the DICGC Act, 1961. Extension of the scheme to the co-operative banks in the three Union Territories (Chandigarh, Lakshadweep and Dadra and Nagar Haveli) is pending as the concerned State Governments are yet to introduce necessary legislative changes in their respective Cooperative Societies Acts. There are no co-operative banks at present in Lakshadweep and Dadra and Nagar Haveli.

[27] "Funding of Deposit Insurance Systems", Usha Thorat, January 2010

of claims settled to premium received in the case of co-operative banks stood at 220 per cent. The cross subsidisation obviously raises the issue of moral hazard. While introduction of risk-based premium is an option, in India, a certain amount of forbearance in this respect has been employed in response to an assessment of trade off between minimising moral hazard and placing additional burden on banks that are already weak and yet serve the very important objective of financial inclusion.

Increasing the deposit insurance premium will need to factor in impact on weak banks

5.118 The deposit insurance regime in India is a low insurance premium regime. With a view to strengthening the DIF, the issue of increasing the deposit insurance premium becomes relevant. In this context, an empirical exercise was undertaken to study the impact on reserve ratio with increase in premium rate from 10 basis points to 30 basis points. The exercise revealed that every 5 paisa increase in premium would lead to an increase in the reserve ratio by 0.06 percentage points. However, any increase in premium would need to factor in the impact of such increase on the weak banks in the system. Further, given the element of cross-subsidisation, the commercial banks would have to bear a disproportionate share of the burden.

Recovery Performance continues to be poor

5.119 The previous FSR had highlighted that the poor recovery performance of DICGC vis-à-vis claim settlements has been a major bottleneck for the regeneration and resilience of the DIF. There has been little improvement in the functioning of the Corporation in this respect with recoveries constituting a mere 14 per cent of claims settled as on March 31, 2010. Legislative disputes challenging the priority of the Corporation in recoveries have hindered the recovery process and build-up of funds. A number of other factors - increasing investment income by expanding the scope of investment options, issues of taxation (taxing the deposit corporation is not a common practice across the world) and a backup line of credit from the central bank (currently the line of credit is restricted to ₹ 5.00 crore) - are important in ensuring the adequacy and resilience of the DIF and increasing the Reserve Ratio and will require careful consideration.

Reducing the time taken to settle claims remains a tough proposition

5.120 For deposit insurance to be credible, it is important that claims are settled at the earliest possible in the wake of a bank failure. In this context, the Fifth Report (2007-08) of the Treasury Committee of the House of Commons (titled "Run on the Rock") has observed that "*There should be requirement in law that all insured deposits should have to be paid within a few days of a bank failing and calling on the deposit protection scheme*".

5.121 As per the DICGC Act, currently, DICGC is required to pay the amount payable in respect of the deposits of each depositor within two months from the date of receipt of the claim list from the liquidator. The liquidator is given three months to prepare the claim lists. While the Corporation is able to disburse the claim amounts within the stipulated period of two months, there are tremendous delays in submission of information by the liquidators. Thus, the average time taken between deregistration of a bank and claim settlement extends to more than a year. Putting in place a robust delivery system to reduce the time taken to effect payments well within the stipulated time, in fact, to even reduce the stipulated time to pay claims, presents a huge challenge given the geographic spread of the country and the unsatisfactory quality of data in respect of particulars of depositors. The process will require leveraging on technology to improve record keeping - the Corporation has already initiated early steps in this direction; and in putting in place an effective system of accountability of liquidators to ensure timely flow of information to the Corporation.

Low levels of coverage could impair effectiveness of the deposit insurance system

5.122 The global financial crisis prompted a number of countries to shift the focus of their coverage from protecting small depositors to stabilising the financial system. As a result, the deposit insurance coverage was increased in many countries, in most cases on a permanent basis. In India, however, no compelling case for increasing the deposit insurance cover was felt given that, under the existing insurance coverage, about 90 per cent of the deposit accounts (number–wise) and about around 55 per cent of total assessable deposits (value-wise) are insured. Nevertheless, the coverage

ratio of deposit insurance in the country remains one of the lowest in terms of per capita income. The need for increasing the cover needs to be examined carefully.

Mandate of the deposit insurance requires to be broadened

5.123 Another critical issue faced by the deposit insurance system in India is to improve its efficacy by upgrading the existing pay box mandate given to DICGC to an extended mandate with powers for least cost resolution, as was observed in the previous FSR. This may, however, require amendment to the DICGC Act, 1961.

Compliance with international norms – some gaps will need to be addressed

5.124 Paragraph 5.112 of this Chapter discussed the draft methodology being finalised by the IADI for the purpose of assessment of compliance with the Core Principles for Effective Deposit Insurance Systems. Before finalisation of the methodology, the IADI conducted its field testing for which DICGC was one of the deposit insurance providers selected.

5.125 The field testing observed that the deposit insurance system in India was compliant or largely compliant in respect of a number of critical issues viz., public policy objectives, mitigation of moral hazard, specification of mandate, empowerment and governance, compulsory membership, coverage, public awareness, legal protection and dealing with parties at fault in a bank failure. However, some important areas, as under, where the functioning of DICGC needed improvement were also identified.

- DICGC has very limited resolution options available: liquidation or merger/amalgamation. A system for early detection of problem banks exists but early intervention is not in the law. DICGC is not informed of problem bank status or activities until the bank's license is revoked.
- DICGC does not receive information necessary to effect prompt reimbursement to insured depositors on a timely basis.
- The deposit insurance fund would be inadequate were a larger bank to fail.
- Foreign branches' deposits are covered by DICGC. There are no reciprocal agreements requiring coordination with deposit insurance systems in other countries.
- While the role and priorities of the DICGC is clearly defined in law, legal obstacles prevent the accurate distribution of recoveries, particularly in the case of urban cooperative banks.

Concluding Remarks

5.126 Fault lines in the regulatory and supervisory architecture permitted the cyclical build up of risks and allowed development of institutions which were "too big to fail". In the aftermath of the crisis, the international community has made substantial progress in putting together a set of reforms which are aimed at increasing the resilience of the global financial system. Going forward, the challenge is going to be in rolling out the reforms agenda in an environment where the global recovery is still fragile, the financial system remains vulnerable, banks in advanced countries continue to face funding risks and sovereign debt of the European countries remains a source of threat to financial stability.

5.127 India weathered the headwinds of the financial crisis with relative equanimity. The financial sector remained resilient, fostered by a well capitalised and well regulated banking system, though the real sector was affected through real, financial and confidence channels. For emerging economies like India, the implementation of the Basel III reforms comes at a time when structural factors are expected to ensure pick up in credit demand. Simultaneously meeting the requirements of additional capital buffers and the sharply growing credit needs of the economy at an affordable cost will be no easy task. However, the comfortable capital adequacy position of the banks in India under Basel II norms means that the Basel III requirements, once fully calibrated, will not unduly stress banks in India.

5.128 Adoption of international norms – in respect of convergence of accounting standards, adoption of compensation principles, reducing reliance on credit rating agencies – will be challenging and will require concerted efforts and suitable calibration to domestic conditions. Concerted efforts to improve the availability of accurate, timely and granular data will also be necessary.

5.129 Interconnectedness between various segments of the financial markets and between financial market participants has emerged as an important element of macroprudential supervision.Closer supervision of institutions which are highly interconnected in payment and settlement systems or through inter-bank liabilities may be warranted.

5.130 Internationally, wide ranging efforts are on going to reduce the moral hazard associated with large and complex financial institutions, improve the resolution capacity of firms and develop effective resolution regimes for cross border financial institutions. In India, domestic banks are unlikely to be classified as global SIFIs. Regardless, policies for domestic SIFIs will need to be strengthened drawing on international policy developments in this respect.

5.131 An assessment of the scope of regulation and its perimeter is critical in view of the role played by the shadow banking sector during the crisis. It assumes greater criticality as the regulatory requirements for the banking industry are tightened. In India, strengthening the regulatory framework for NBFCs within the regulatory ambit of the Reserve Bank is a continuing effort. The present system of entity regulation could leave some regulatory gaps, which will need to be addressed.

5.132 CCP arrangements have been the preferred settlement mode for critical markets, wherever feasible. The risks arising out of concentration of risks in CCP will need to be carefully managed on an ongoing basis. The payment and settlement system infrastructure functioned smoothly but some soft spots remain. Safety net arrangements are in place but face a number of challenges viz., increasing the mandate of the deposit insurance system, improving funding and reducing the time taken to settle claims.

Chapter VI
Resilience of Indian Banking Sector

The resilience of the commercial banks in respect of credit risk, interest rate risk and liquidity risk were studied through stress testing by imparting extreme but plausible shocks. For the credit risk stress test a sensitivity analysis of capital adequacy ratios has been done by imparting shocks to the NPA levels. The interest rate risk has been studied through the Duration of Equity (DoE) method. The liquidity stress tests assess the ability of a bank to withstand unexpected liquidity drain without taking recourse to any outside liquidity support. The credit risk of the commercial banks has also been tested through a macro stress test model which links measures of credit risk to the macroeconomic variables.

6.1 Stress testing on the banking sector is undertaken on a continuous basis in the Reserve Bank to assess the resilience of the financial system to exceptional but plausible stress events. The stress testing undertaken normally uses single factor sensitivity analysis[1] . In addition, a stress testing model which assesses the impact of macroeconomic variables on the financial soundness indicators of banks has also been attempted. In formulating the quantum of shocks, judicious criteria on selected indicators based on the experience of the Indian financial system are applied. The methodologies used in these stress tests are described in Annex-1.

6.2 The stress tests currently being conducted by the Reserve Bank on regular basis cover the following risks:

- *Credit risk, which estimates the impact on capital adequacy by stressing the Non-Performing Advances (NPAs) for the entire credit portfolio.*
- *Interest rate risk, which estimates the erosion in economic value of the balance sheet for a given interest rate shock using the "Duration of Equity" method both at the system and the individual bank levels.*
- *Liquidity risk, under different scenarios, which include sudden withdrawal of deposits on account of loss of confidence due to adverse economic conditions.*

6.3 A macro stress testing model which assesses the impact of macro economic variables like GDP growth rate, interest rates, inflation and exports on the asset quality of banks and their capital adequacy ratio has also been presented.

Credit Risk

6.4 The resilience of scheduled commercial banks to credit risk was tested by stressing the credit portfolio of banks with increases of 100 per cent, 200 per cent and 300 per cent in NPA levels as compared to the levels as at end-September 2010. At the aggregate level, a significant degree of resilience was observed and system CRAR remained in excess of regulatory requirements even under the most stressed scenario (i.e. an assumed increase in NPAs by 300 per cent). At the individual level, little deterioration in the CRAR of banks was observed when NPAs were assumed to increase by 100 per cent though the CRAR of several banks fell below regulatory requirements in case of assumed increases in NPAs by 200 per cent and 300 per cent. In the extreme case of an assumed rise in the level of NPAs by 300 per cent, the CRAR of about 20 banks accounting for a share of around 40 per cent of the total assets of the banking sector would fall below the regulatory requirement of 9 per cent CRAR (Chart 6.1). The credit risk stress tests, therefore, do not indicate any significant cause for concern except under extremely stressed scenarios.

[1] The stress tests undertaken are based on inputs taken from the Handbook on Financial Sector Assessment, published by the International Monetary Fund and the World Bank in September 2005. Drawing on this framework, the methodology was calibrated to suit domestic realities, taking on board the state of development of the financial system and the maturity of financial institutions and markets. This is the approach which was also used by the Committee for Financial Sector Assessment.

Interest Rate Risk

6.5 Duration of Equity (DoE)[3] of commercial banks shows an increasing trend in the recent quarters, pointing towards greater interest rate risk being assumed by banks (Table 6.1). This is also reflected at the level of individual banks with the number of banks with DoE between 10 years and 20 years having increased under the two assumed stress scenarios[4] as compared to the position in December 2009, which was assessed in the last FSR (Charts 6.2 and 6.3). The increased interest rate risk assumed by the bank warrant careful monitoring.

Liquidity Risk

Commercial Banks

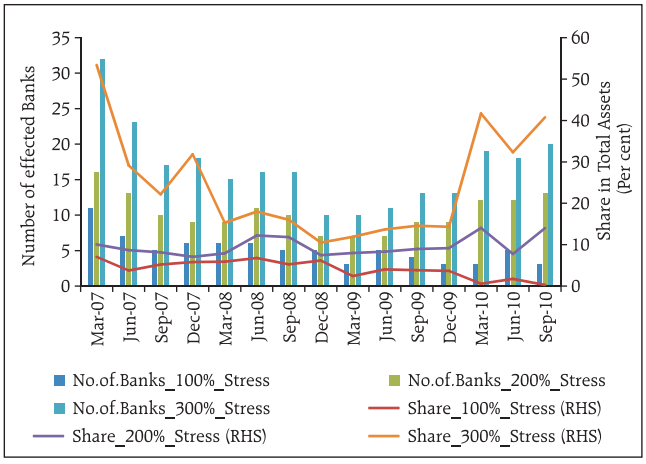
6.6 The liquidity stress tests assess the ability of a bank to withstand unexpected deposit withdrawal without recourse to any outside liquidity support. The scenarios have been developed based on stringent assumptions and assume unexpected deposit withdrawals in different proportions (depending on the type of deposits[5]). The tests assess the adequacy of liquid assets available to fund these withdrawals. The deposit run is assumed to continue for five days.

6.7 The stress tests showed that some banks did not have adequate liquid assets to meet the withdrawals on the first day itself. The number of such banks was higher in September 2010 as compared to March 2009 and March 2010 though there was some improvement as compared to June 2010. However, the total number of banks unable to withstand the stress scenario was higher in September 2010 compared to all the previous periods (Charts 6.4 A to D) indicating a slight worsening of the position under the liquidity stress tests relative to the previous assessment.

Urban Co-operative Banks

6.8 Stress tests on liquidity risk were conducted on the Scheduled Urban Co-operative Banks (UCBs) using

Chart 6.1 : Commercial Banks Falling Below 9 % CRAR on Increase in Non Performing Advances[2]



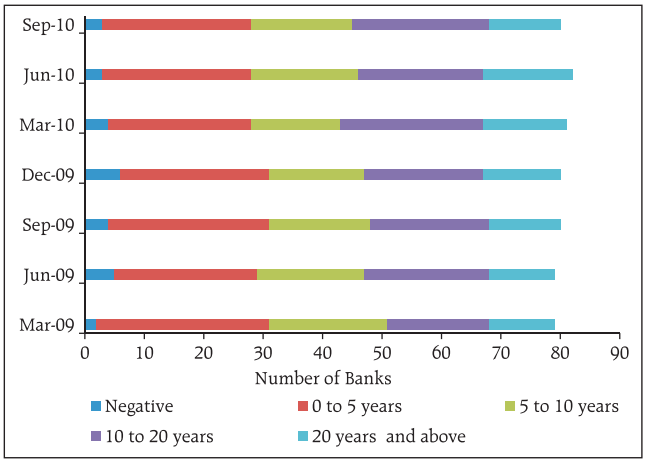
Source: Supervisory Data and RBI staff calculations.

Table 6.1: Duration of Equity (Commercial Banks)

DOE -> years	March 2009	June 2009	Sep 2009	Dec 2009	March 2010	June 2010	Sep 2010
Scenario I - Savings Deposits withdrawal within 1 month	8.0	8.7	8.9	9.9	10.5	11.4	12.2
Scenario II - Savings Deposits withdrawal in 3 - 6 months	7.2	7.9	8.0	9.1	9.6	10.5	11.2

Source: Supervisory Data and RBI staff calculations.

Chart 6.2 : Duration of Equity - Frequency on Time Buckets (Scenario I - Savings Deposits withdrawal within 1 month)



Source: Supervisory Data and RBI staff calculations.

[2] CRAR has been calculated under Basel I in order to obtain a sufficiently long time series of historical data. All Scheduled Commercial Banks (except RRBs and LABs) have moved to Basel II framework with effect from March 2009.

[3] The Duration of Equity calculates the erosion in accounting capital due to a unit increase in interest rates. Higher the duration of equity, more is the interest rate risk. A DoE of 20 years implies that an interest rate shock of 500 basis points will be required to wipe out capital.

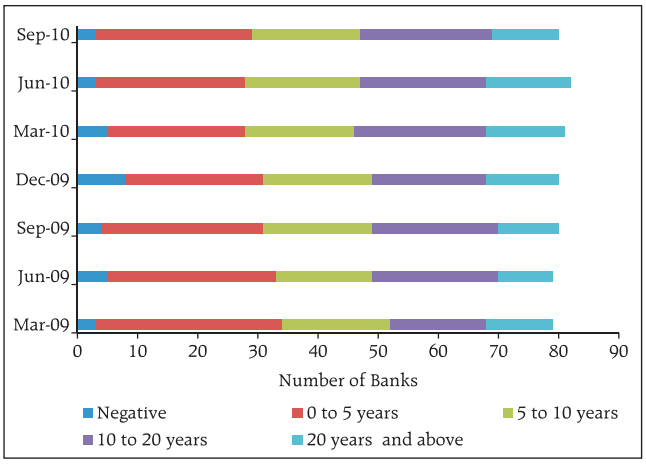
[4] Savings deposits are assumed to be withdrawn in 1 to 28 days under scenario I while they are assumed to be withdrawn in 3 to 6 months under scenario II. The time band-wise rate sensitive liabilities have been accordingly adjusted. Scenario I implies a lower duration of liabilities and is the more stringent scenario of the two.

[5] These are described in Annex I.

their asset portfolio as at end-September 2010. Liquid assets forms 35.6 per cent of total assets and more than 88 per cent of total investments of the scheduled UCBs are in the form of SLR investments.

6.9 The stress tests for liquidity risk for the proportion of deposits, the withdrawal of which can be managed by the banks without any external assistance (i.e. through sale of their own investments) have been conducted for five assumed scenarios. At the aggregate level (aggregated for similar grade), the manageable proportion of deposits by the scheduled UCBs sector under various scenarios ranges from 12 per cent under scenario I (no liquidation of investments) for Grade 1 banks to 54 per cent for Grade

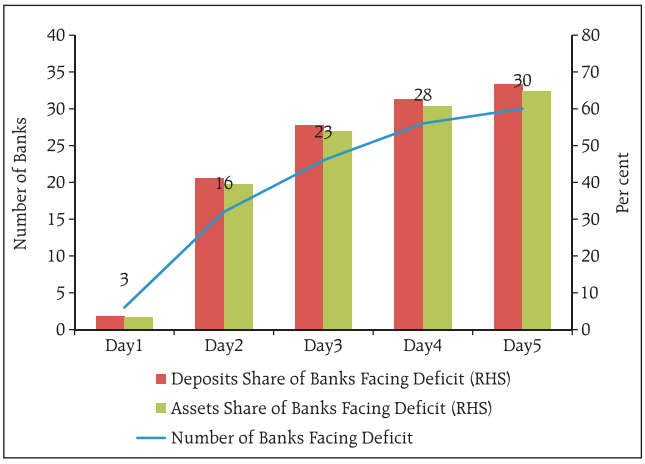
Chart 6.3: Duration of Equity - Frequency on Time Buckets (Scenario II - Savings Deposits withdrawal in 3 - 6 months)



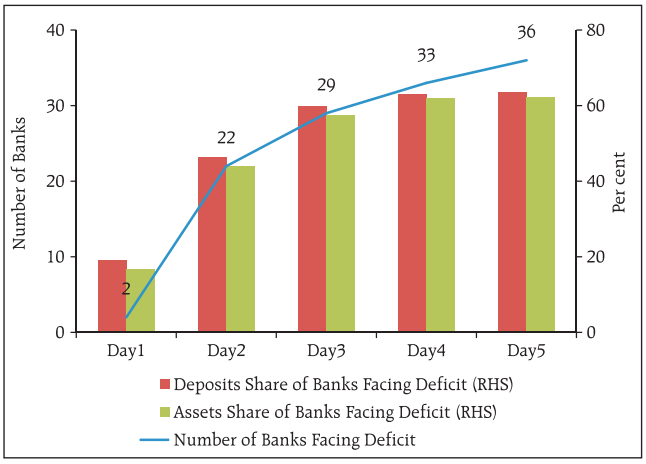
Source: Supervisory Data and RBI staff calculations.

Chart 6.4 : Liquidity Position of Banks Stressed Scenario

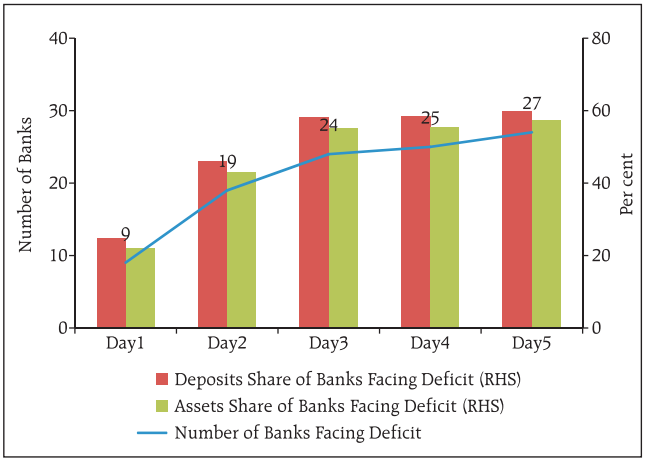
A: March 2009



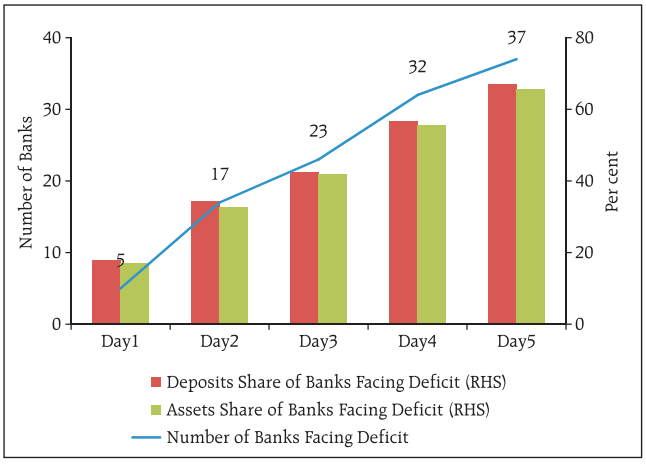
B: March 2010



C: June 2010



D : September 2010



Source: Supervisory Data and RBI staff calculations.

3 banks under scenario V (with 100 per cent liquidation of investments) (Chart 6.5 and Chart 6.6).

6.10 The results show that the liquidity position of scheduled UCBs is comfortable. The stress tests for manageable proportion of deposits in an event of a distress run on deposits (on account of sudden loss of confidence of investors) reflected that the scheduled UCBs have comfortable liquid portfolio to manage the stressed run on deposits. In a normal course of business (without sale of investments), the scheduled UCBs can overall manage a run of 12.2 per cent of total deposits without any external help.

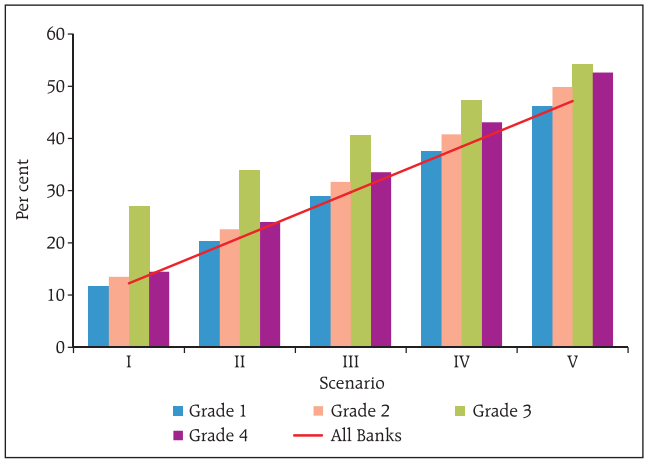
6.11 In the worst scenario, which may force banks to liquidate all their investments, collectively they can manage a run of up to 47.2 per cent of deposits. Bank-wise, except seven banks, all other banks can manage a run of more than 40 per cent of deposits.

Macro-stress tests

6.12 Macroeconomic stress tests are increasingly considered as the basic, indispensible tool for any systemic efforts to reduce the likelihood and impact crisis events. Stress testing is basically a – 'what if thinking' – conducted in a structured manner (Box 6.1).

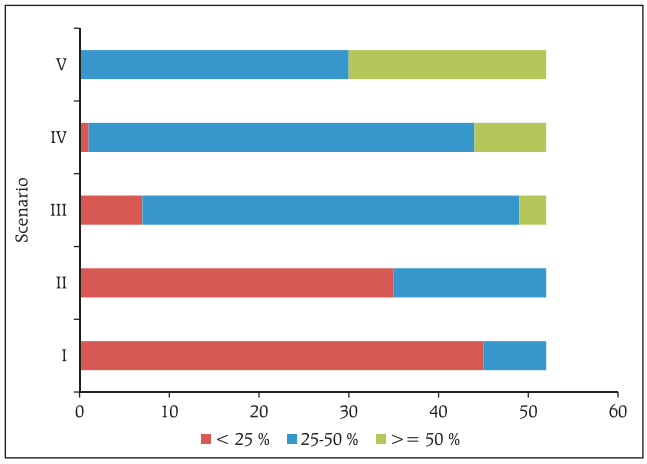
6.13 As an enhancement in the stress testing methodology, a preliminary beginning to model based approach for the macro-stress test has been made. The equations have been estimated which directly link macroeconomic variables to measures of bank performance. The ratio of non-performing advances (NPAs), defined as ratio of gross non-performing advances to total advances, has been chosen as the dependent variable from the list of financial soundness indicators. The macroeconomic variables have been classified into five groups (a) Growth indicators (b) Price stability indicators (c) Interest rates indicators (d) Financial Markets indicators (e) External sector indicators. In order to identify the significant risk factors from each group, bivariate regressions are estimated using a single macroeconomic risk factor with varying lags. The result of bivariate regressions gives a list of relevant variables from each group which could be considered for inclusion in the multivariate model. The scenarios are created using 'shocked/ stressed' variables by changing values of the independent variables.

Chart 6.5 : UCBs - Bank-group wise Manageable Proportion of Deposit in Various Scenarios - September 2010



Source: Supervisory Data and RBI staff calculations.

Chart 6.6: UCBs - Distribution According to Manageable Proportion of Deposits – September 2010



Source: Supervisory Data and RBI staff calculations.

Box 6.1 Macro- Stress Testing

Macro stress-testing refers to a range of techniques used to assess the vulnerability of a financial system to "exceptional but plausible" macroeconomic shocks. Macro stress testing has been an important component of the Financial Sector Assessment Programs (FSAPs) launched by the IMF and the World Bank in the late 1990s and has become an integral part of the financial stability toolbox of policymakers. Macro stress-testing has received considerable attention in the last few years. Central banks and international organisations have taken the lead in this area of research, given their particular concern for financial stability issues.

The two main methodological approaches to macro stress-testing are:

- a "piecewise approach" that evaluates the vulnerability of the financial sector to single risk factors, by forecasting several "financial soundness indicators" (such as non-performing advances, capital ratios, etc.) under various macroeconomic stress scenarios;
- an "integrated approach" combining the analysis of the sensitivity of the financial system to multiple risk factors into a single estimate of the probability distribution of aggregate losses that could materialise under any given stress scenario.

The foundation of macro-stress testing is built on the following steps:

a. First step includes selection of the set of relevant financial institutions. A number of aspects need to be evaluated in this context. Should the analysis be restricted to specific section of the financial system or should it include all the sectors, for example, banks, non-banks, insurance companies, pension funds, etc.? Should the analysis be based on only the large banking institutions relevant for systemic stability? How to deal with financial conglomerates? Furthermore, the relevant portfolio for macro stress-testing depends partly on the nature of the risks to be analysed and partly on availability of accurate and granular data.

b. Once the scope of the analysis covering a set of institutions and asset classes is identified, measuring risk exposure is the next task. Measurement of risk exposures is particularly challenging given the fact that portfolios are continuously evolving in response to specific investment and hedging strategies and in response to macroeconomic developments/shocks.

c. Next is the determination of some key elements in the design of a stress scenario which includes the type of risks to analyse (market, credit, interest rate, liquidity and other risks); single or multiple risk factors to be shocked; parameter(s) to shock (prices, volatilities, correlations); size of the shock and time horizon. The analysis of a wider range of risk factors enhances the predictive power of the stress-test but imposes increased computational burdens. Similarly, simulating a comprehensive scenario including multiple shocks allows more realistic predictions than focusing on ad-hoc sensitivities of single parameters.

d. The most important issue is the design of stress scenarios. One of the key decisions is how to calibrate the size of the shocks. Setting the size of the shock too low or too high might make the exercise unrealistic. In general, shocks can be calibrated to the largest past movement in the relevant risk variables over a certain horizon (or be based on historical variance). Alternatively, the estimated joint empirical distribution of past deviations from trend of the relevant risk variables can be used for simulating the stress scenario. Ideally, structural macro-econometric models should be employed to fully characterise the interacting shocks affecting key real economic indicators or asset prices that define the scenario of interest. Otherwise, the reduced-form reaction functions could also be used for scenario generation.

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6.14 Credit risk, represented by the ratio of NPA, is modeled by the logistic functional form in order to better capture tail risk and expressed as

$$NPA_t = \frac{1}{1 + e^{-y_t}}$$

where the variable y can be interpreted as an index representing the state of the economy, which is associated with an improvement/deterioration in the credit quality of bank portfolios. The logit transformation[6] is then assumed to be a function of

[6] The logit transformation helps to map the original variable, which was bounded by 0 and 1, into a real line, which could be used in an ordinary linear regression equation. The logistic functional form is also convenient in that y is given by the logit transformation:

$$L(NPA_t) = Ln\left(\frac{NPA_t}{1 - NPA_t}\right) = y_t$$

exogenous macroeconomic factors (X) and a surprise factor represented by an error term, i.e.:

$$y_t = \beta_0 + \beta_1 X_{1t} + \beta_{12} X_{2t} + \ldots\ldots + \beta_n X_{nt} + e_t$$

Identification of significant risk factors

6.15 Initially, the non-performing advances ratios are regressed against various macroeconomic variables. The coefficients of these regressions provide an estimate of the sensitivity of bank borrowers to the relevant macroeconomic risk factors.

$$\text{logit\_npa}_t = \alpha * \text{logit\_npa}_{t-1} + \beta * X_{t-k}$$

where k represents the most significant lag.

6.16 The series consists of quarterly data from 1999 to 2010. The original data series have been transformed for getting stationary time series. The price variables, interest rate variables and exchange rate variables have been used in levels; the export and trade variables have been taken as ratio to GDP and the growth variables have been taken as annual percentage changes.

6.17 From the bivariate equations with large R^2, the variables which have significant coefficients and having expected signs are selected for the multivariate equation. The variables chosen for bivariate regressions are given in Table 6.2.

Table 6.2 : Variables for Bivariate Regression

	Variable x	Expected sign
Growth	Real GDP	-
	Real GDP - agriculture	-
	Real GDP - industry	-
	Industrial production	-
Price stability	WPI	-/+
	CPI	-/+
	M3	-/+
Interest rates (Nominal)	Interest rate - short term	+
	Interest rate - long term	+
Financial markets	Sensex	-
	Nifty	-
External sector	Exchange rate (USD)	-/+
	REER	-/+
	Exports	-
	Trade	-/+

NPA-ratio- ratio of NPA to total advances
Price stability indicators- wholesale/ consumer price index, money supply,
Interest rate indicators - short-term and long term nominal interest rates (treasury bill yield:15- 91 days and government 10-year bond),
Financial market indicators - stock market indices, External sector indicators - exchange rates, export/ trade as ratio to GDP

Multivariate regression model: Estimates

6.18 Using the identified variables, a multivariate regression model is constructed, where the coefficients are significant, have expected signs and the residuals are stable. The model is described in Table 6.3.

Table 6.3 : Multivariate Regression Model: Estimated Coefficients of Variables

	Dependent variable: Logit transformation of NPA (logit_npa)		
	Lag (Quarters)	Coefficient	p-values
Constant term	-	-0.1217	0.0911
Logit of NPA	1	0.8718	0.0000
Real Agriculture GDP Growth	1	-0.0041	0.0172
Real Industry GDP Growth	3	-0.0081	0.0044
Nominal Interest Rate (short term)	1	0.0111	0.0332
Exports (ratio to GDP)	2	-0.0184	0.0507

6.19 The above model suggests that non-performing advances ratio is strongly auto-correlated. Further, NPA ratio rises with decline in agricultural or industrial GDP growth rates and *vice-versa.* The impact of agriculture is faster with 1 quarter lag, while the impact of industry is felt after 3 quarters. Moreover, the NPA ratio is positively related to short term nominal interest rate with 1 quarter lag. Finally, the NPA ratio rises with fall in export-to-GDP ratio with a lag of 2 quarters. The adjusted R^2 is 0.98.

6.20 The Breusch-Godfrey LM test for autocorrelation in residuals shows no serial correlation in residuals.

The White (heteroskedasticity robust standard errors) as well as Newey-West (for presence of both heteroskedasticity and autocorrelation) estimators for this specification are not very different and the test statistics for statistical significance of coefficients are generally unchanged. The regression results have been obtained using Newey-West variance estimator, to control for possible autocorrelation or heteroskedasticity in the presence of lagged dependent variables among the regressors. Stability diagnostics through examination of recursive residuals shows that the parameters of the model are stable across various sub-samples of the data.

The stress scenarios

6.21 The calibrated model is used to forecast NPAs under the baseline as well as stress scenarios. The stress test risk horizon is for two years. Accordingly, the baseline and stress scenarios have been constructed (Table 6.4 and Table 6.5).

6.22 The forecast values of the ratio of the non-performing advances under baseline and stress scenarios are given by the model (Chart 6.7).

6.23 The forecast values of the ratio of the non-performing advances, derived from the model, have been translated into capital ratios under each scenario (Chart 6.8). The translation is based on a "balance sheet approach", by which capital in the balance sheet is affected via the provisions and net profits. In order to estimate the new capital ratio under each scenario, the provisions coverage ratios were kept at the current level. Further, the credit growth, risk-weighted assets growth and profit growth have been assumed to be 20, 12 and 10 per cent, respectively. The forecasted increase in NPAs was distributed across sub-standard, doubtful and loss categories in the same proportion as prevailing in the existing stock of NPAs.

6.24 The results show that, amongst the list of macroeconomic variables in the aforesaid macro stress testing model, the impact of export shock on the gross NPAs ratio is the highest. However, the results under different scenarios, suggest that the macro-economic

Table 6.4 : Baseline Projections

(Per cent)

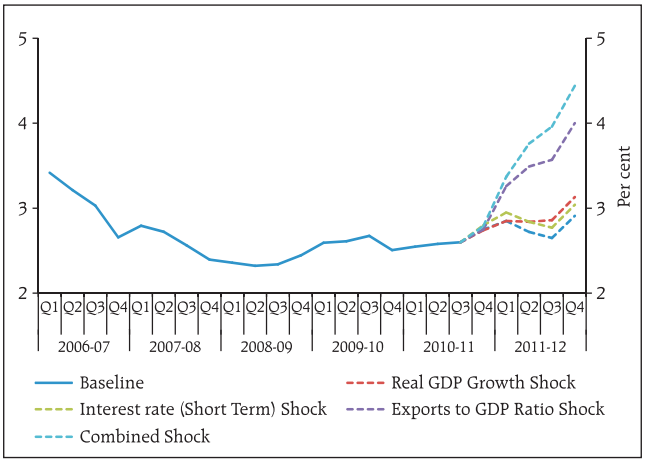
Forecast Period		Real GDP Growth	Nominal Interest rate (Short Term)	Exports to GDP Ratio
2010-11	Q3	8.5	5.5	12.0
	Q4	8.5	5.5	12.0
2011-12	Q1	9.0	5.0	12.0
	Q2	9.0	5.0	12.0
	Q3	9.0	5.0	12.0
	Q4	9.0	5.0	12.0

Table 6.5 : Stress Scenarios

(Per cent)

Shock level (per cent)	Real GDP Growth Shock	Nominal Interest rate (Short Term) Shock	Exports to GDP Ratio Shock
First year time horizon	- 20.0	+ 20.0	- 40.0
Second year time horizon	- 10.0	+ 10.0	- 25.0

Chart 6.7: Non-Performing Advances under Stress Scenarios



Projections from 2010-11 Q3 to 2011-12 Q4

Source: Supervisory Data and RBI staff calculations.

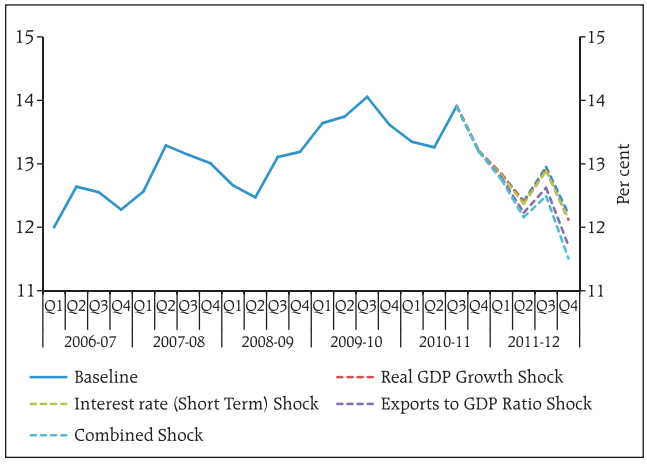
shocks would not substantially threaten the Indian banking sector.

6.25 As indicated above, the model described here encompassed the first steps towards putting in place an extensive macro stress testing framework to assess the build up of systemic risks in the system. In the coming periods, this methodology will continue to be developed so that it can become part of a growing number of tools that can be used to evaluate the soundness of individual banks and that of the financial system as a whole.

Concluding Remarks

6.26 Stress tests of the credit risk exposure of banks reveal a reasonably comfortable position and resilience of banks to withstand unexpected deterioration in credit quality. However, some deterioration in the capital position of banks is seen in the assumed scenarios of doubling or tripling of the current NPA levels. The increasing trend in the Duration of Equity of commercial banks suggests more interest rate risk and therefore requires active monitoring. The liquidity stress test results show that some banks face liquidity constraints under the stringent stress scenarios both for commercial banks as well as UCBs. The liquid assets positions needs to be assessed and improved to meet any adverse economic condition.

Chart 6.8: Capital Adequacy Ratios :Translated from NPAs under Stress Scenarios



Projections from 2010-11 Q3 to 2011-12 Q4
Source: Supervisory Data and RBI staff calculations.

6.27 The macro-stress test for credit risk exposures focuses on interdependence of credit risk and the state of the economy, as measured by macroeconomic variables. The results show that Indian banking sector is at a reasonably comfortable position and resilient to withstand unexpected deterioration in credit quality. The impact of shocks on macroeconomic variables constructed under various stress scenarios is found to be muted. However, risks to domestic macroeconomic variables arising from any further deterioration in the global economic conditions need to be monitored.

Annex 1: Stress Testing Methodologies

As a part of regular surveillance approach, stress tests were conducted covering the following risks:

- *Credit risk, which estimates the impact on capital adequacy by stressing the Non-Performing Advances (NPAs) for the entire credit portfolio.*
- *Interest rate risk, which estimates the erosion in economic value of the balance sheet for a given interest rate shock using the "Duration of Equity" method both at the system and the individual bank levels.*
- *Liquidity risk, using different scenarios, which include sudden withdrawal of deposits on account of loss of confidence due to adverse economic conditions.*

The resilience of the commercial banks in response to the above shocks were studied from the above three perspectives. The analysis covered all scheduled commercial banks. The methodology adopted for the stress tests is in line with the stress tests conducted for the first FSR. These stress tests are single factor sensitivity analysis and do not take into account the inter-linkages of macroeconomic variables with the financial soundness indicators.

Credit Risk

To ascertain the resilience of banks, the credit portfolio was shocked by increasing NPA levels, for the entire portfolio, along with a simultaneous increase in provisioning requirements. The estimated provisioning requirements so derived were first adjusted from the annualised profit of the banks 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 quarterly supervisory data from March 2007 through September 2010. The scenario assumed increase in the existing stock of NPAs by 100, 200 and 300 per cent and enhanced provisioning requirements of 1 per cent, 25 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 duration of equity (DoE) or the net-worth duration approach in stress tests could help in calculating the erosion in capital due to unit increase in interest rates. The analysis takes into account the interest rate sensitive items in balance sheet of the banks' portfolio and also the banks' exposure to interest rate sensitive off balance sheet items. Subject to certain limitations, DoE captures the interest rate risk and helps in moving towards the assessment of risk based capital. The higher the duration of equity, more is the interest rate risk and accordingly greater the requirement of capital.

- Duration Gap = (Duration of assets * total assets – Duration of liabilities * total liabilities) / total assets
- Duration of Equity = Duration Gap * Leverage Ratio
  = (Duration of assets * total assets – Duration of liabilities * total liabilities) / Capital & Reserves
- Interest rate shock required to wipe out the capital funds = % Change in Price / DoE = 100/ DoE

Under this approach, the duration of equity of a bank's portfolio is computed under two scenarios: the savings deposits are assumed to be withdrawn in the first time band viz. 1 to 28 days (scenario I); the savings deposits are assumed to be withdrawn in 3 to 6 months time band (scenario II). The time band-wise rate sensitive liabilities have been accordingly adjusted under the two scenarios.

Liquidity Risk

Scheduled Commercial Banks

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 scenarios developed are based on very stringent assumptions, which are extreme. The analysis is done as at end-March 2009 through end-September 2010.

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. The deposit run is assumed to continue for five days.

- The objective is to capture the ability of the bank to meet unexpected withdrawal of deposits for five days through sale of its available liquid assets without any outside support.
- Deposits are segregated into three types, current deposits, savings deposits and term deposits.
- Liquid assets consist of cash funds, excess CRR balances with the Reserve Bank, balances with other banks payable within one year and investments maturing within one year.
- The total unexpected withdrawal of deposits is assumed to take place in the following proportion:
  - Current deposits – three times the proportion of reported outflows of current deposits in 1-14 days time bucket.
  - Savings deposits – three times the proportion of reported outflows of savings deposits in 1-14 days time bucket.
  - Term deposits – two times the proportion of reported outflows of term deposits in 1-14 days time bucket.
- The stressed withdrawal is assumed to take place in a span of five days as 40, 30, 15, 10 and 5 per cent from first day to fifth day respectively.
- The bank is assumed to meet stressed withdrawal of deposits through sale of liquid assets.
- 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.

Urban Co-operative Banks

Stress test on liquidity risk were conducted on the Scheduled Urban Co-operative Banks (UCBs) using their asset portfolio as at end-September 2010. It is assumed that banks' liquid assets such as Cash in hand, balances with banks, money at call / short notice and investments (SLR as well as non-SLR) are used for getting liquidity in times of stress before resorting to any external help. It is assumed that all the investments can be sold out at 10 per cent haircut during the period of deposit run. Other assets of UCBs such as, loans and advances, overdue interest receivable, premises, furniture, fixtures, bills purchased and discounted are treated as illiquid assets. The proportion of deposits run which can be managed by the UCBs without any external help (might be by the sale of investments) has been used for testing the resilience.

For the purpose of stress test analysis on liquidity, five scenarios are considered wherein percentage of total investment portfolio of UCBs is considered which can be liquidated in times of stress. Scenario I describes sale of investments on account of (a) normal course of business without any stress, or (b) the extreme (though rare in practice) situations where banks have made all their investments in illiquid/ non-marketable securities, or (c) there is no market for banks' investments on account of complete loss of confidence. In the most extreme stress of deposit run, the banks may need to liquidate their all the investments (i.e. 100 per cent) with assumed haircut, which is described as Scenario V. Other Scenarios include 25 per cent (Scenario II), 50 per cent (Scenario

III) and 75 per cent (Scenario IV) liquidations of total investments with assumed haircut. The proportion of liquidation depends on extant of run on deposits to be managed.

Macro stress test - Credit Risk

To ascertain the resilience of banks, the credit risk was modeled as functions of macroeconomic variables. The analysis was carried out on ratio of non-performing advances to total advances at the aggregate level for the commercial banking system as a whole. With the help of the developed model the NPA ratio was forecasted for next few quarters. This included both baseline and stressed scenarios. On the forecasted values of NPAs, the capital adequacy ratios were derived keeping the existing loan loss provisions intact.