Framework for the conduct of macroprudential policy in India: experiences and perspectives

Kamalesh C. CHAKRABARTY
Deputy Governor
Reserve Bank of India

In India, we have a relatively long history of experience with conduct of macroprudential policy. The Reserve Bank has, over the years, attempted to address systemic risks in both its dimensions – the time dimension or procyclicality, and the cross sectional dimension – within a macroprudential framework.

The article will review India's experiences/experiments with macroprudential policy prior to the crisis, during the crisis and more recently, the experience of using countercyclical policy to address the challenges posed by a sharp increase in volatility of exchange rates together with a heightened external deficit. The use of macroprudential policy in India has been extensive and multi-faceted – spanning the banking and non-banking financial sector; addressing asset price spirals and credit booms; encompassing capital flows and systemic liquidity management; dealing with large and complex financial institutions; calibrating the development of the OTC derivative markets; and tackling interconnectedness in the banking and financial sector and between the financial and the real sector.

The article will also touch upon the institutional arrangements for financial stability in India, pre and post the crisis. Prior to the crisis, no agency was explicitly granted a mandate for financial stability though the Reserve Bank acted as the implicit systemic regulator. Post crisis, institutional arrangements have been strengthened with the setting up of an inter-agency Financial Stability and Development Council.

The article will finally attempt to present the lessons emanating from India's experience with operationalising a macroprudential policy framework, especially with regard to some of the major emerging questions – signal extraction, use of rules versus discretion in policy making, coordination with other policy segments (primarily monetary policy), assessing the impact of the policy measures, etc. It will then touch upon some of the challenges, viz. developing a framework for systemic risk assessment, assessing and plugging data gaps, and also focus on the challenges for extending the scope of macroprudential policy beyond the financial sector to the corporate sector, specifically for managing risks arising out of corporate leverage and un-hedged foreign exchange exposures, and to the sovereigns.

Post crisis, the term "macroprudential" is increasingly being used in regulatory and supervisory parlance. Key amongst the post crisis lessons was that financial stability needs to be pursued as a separate policy objective and that microprudential regulation and supervision need to be supplemented by macroprudential oversight of the financial system. However, there is as yet no commonly accepted definition of the term. The Financial Stability Board (FSB), International Monetary Fund (IMF), Bank for International Settlements (BIS), in their February 2011 update to the G20 on "Macroprudential policy tools and framework", define macroprudential policy as a policy that uses primarily prudential tools to limit systemic or system-wide financial risk, thereby limiting the incidence of disruptions in the provision of key financial services that can have serious consequences for the real economy, by:

- dampening the build-up of financial imbalances and building defenses that contain the speed and sharpness of subsequent downswings and their effects on the economy;

- identifying and addressing common exposures, risk concentrations, linkages; and interdependencies that are sources of contagion and spillover risks that may jeopardise the functioning of the system as a whole.

In 2009-2010, the Committee on the Global Financial System (CGFS) conducted a preliminary "stocktaking" of issues and experiences related to the design and implementation of macroprudential policy. The CGFS survey showed that macroprudential instruments or interventions had been widely applied, especially in emerging markets. The interventions had targeted a variety of problems arising from the financial system and financial behaviour, at both aggregated and highly sector-specific levels.

The Reserve Bank of India (RBI) has been using macroprudential polices to address systemic risks both in their time and structural dimensions, as part of its toolkit for the pursuit of financial stability. This article attempts to share some of the experiences of RBI with regard to the macroprudential measures implemented and their various dimensions including objectives, approach, methodology and effectiveness. The article first presents a brief outline of the structure of the Indian financial system, the extant regulatory framework and mechanism for inter-regulatory coordination.

1| The Indian financial sector

1|1 Institutions

The financial landscape in India is diversified and interconnected. The sector has grown rapidly, especially over the last couple of decades with overall assets amounting to nearly 150% of the country's GDP.

The system is bank dominated with commercial banks constituting 61% of the financial system's total assets. Within the commercial banking sector, public sector banks comprise the largest segment, accounting for 72% of the commercial banking sector's total assets.

Other credit institutions in the country comprise regional rural banks, cooperative credit institutions and deposit taking non-banking financial companies (NBFCs), which account for 9% of total financial sector assets. Complementing the deposit taking institutions in the country are the NBFCs (non-deposit taking), insurance companies, mutual funds and pension funds.

1|2 Regulatory arrangements

The country has a well-defined regulatory architecture. RBI regulates the banks and the NBFCs. It also regulates the money, government securities and foreign exchange markets and the payment and settlement systems. There are other sector specific regulators in the country for the capital market, insurance sector and pension funds.

1|3 Pursuit of financial stability

In India, prior to the crisis, no agency was explicitly granted a mandate for financial stability though RBI acted as the implicit systemic regulator. The Reserve Bank of India Act (1934) provides a broad legal mandate to RBI to secure monetary stability and generally to operate the currency and credit system of the country to its advantage. In practice, this meant the dual objective of growth and price stability, the relative emphasis being dependent on the context. In 2004, RBI formally added financial stability as an additional policy objective in view of the growing size and importance of the financial sector.

Table 1

(Assets in USD billions, share in %)

Institutions (March 2013)	Assets[a]	Share of total assets	Share of GDP
Scheduled commercial banks[b]	**1,622**	**61.2**	**87.9**
Public sector banks	1,165	44.0	63.2
Private sector banks (old)	82	3.1	4.4
Private sector banks (new)	260	9.8	14.1
Foreign banks	114	4.3	6.2
Co-operative and rural sector[c]	**227**	**8.6**	**12.3**
Regional rural banks	51	2.0	2.8
Urban cooperative banks	62	2.3	3.4
Rural cooperatives[d]	114	4.3	6.1
Non-banking financial institutions	**800**	**30.2**	**43.3**
Deposit taking NBFCs	23	0.8	1.2
Non-deposit taking NBFCs	206	7.8	11.2
Specialised financial institutions (EXIM Bank, NABARD, SIDBI, NHB)	72	2.7	3.9
Insurance companies[e]	344	13.0	18.6
Pension funds[f]	5	0.2	0.3
Mutual funds[g]	150	5.7	8.2
Total financial system assets	**2,649**	**100**	**146.6**

Note: GDP (at market prices) as at March 2013 = USD 1,844 billion.
a) Exchange rate as on April 2, 2013 (1 USD = INR 54.3345).
b) RBI supervisory data (domestic assets only).
c) RBI Report on trends and progress in banking (2013) – data source for RRBs, UCBs, NBFCs and specialised FI.
d) Data on rural cooperatives available for 2012 only.
e) Source: IRDA – Total investment by insurance companies – Annual Report.
f) Source: PFRDA – AUM of seven fund managers under NPS.
g) Source: AMFI – Average AUM for the quarter ended March 2013.

In 2010, a Financial Stability and Development Council (FSDC) was set-up to strengthen the institutional mechanism for financial stability. Though not a statutory body, the Council is chaired by the Finance Minister and includes the Governor of RBI, heads of other sectoral regulators and Ministry of Finance officials as members. The FSDC is assisted by a subcommittee chaired by the Governor.

2| Conduct on macroprudential policy: Indian experience – measures

India's experience with the conduct of macroprudential policy has spanned initiatives to address both dimensions of systemic risks – procyclicality and cross-sectional risks. Policies to counter procyclical trends through pre-emptive countercyclical provisioning and differentiated risk weights for certain sensitive sectors were adopted in 2004, during the expansionary phase of the economy. The experience with the policies to address interconnectedness in the financial system is relatively longer. India has put in place a framework for closer monitoring and supervision of large and potentially systemically important financial institutions/groups – termed financial conglomerates – in 2004, well ahead of the post crisis global initiatives. Evidence of India's experience with macroprudential measures also spans certain concerns specific to emerging markets, notably its approach to capital account management.

2|1 Countercyclical measures

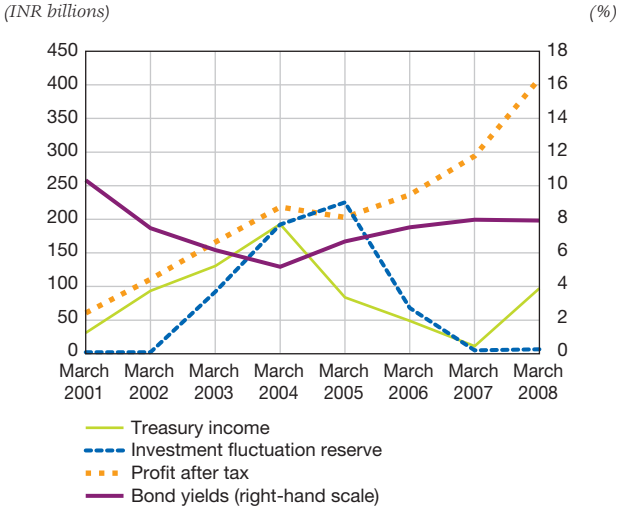
Investment fluctuation reserve

One of India's early experiments with macroprudential policy was aimed at countering the impact of fluctuations in interest rates on banks' marked to market profits. In the early 2000s, banks were enjoying profits from falling interest rates. To prepare banks to counter the impact of rising interest rates on treasury profits when the monetary cycle reversed, RBI asked banks to build-up an investment

fluctuation reserve (IFR) up to at least 5% of their investment portfolio by transferring the gains realised on sale of investments within a period of five years. The IFR was allowed to be drawn down when the interest rate cycle turned and treasury incomes started falling. The prescription was withdrawn once the capital charge for market risk was introduced. In the meanwhile, the IFR enabled banks to maintain stable capital adequacy and ensured that a cushion was built-up during "good times", which was then used to "buffer" the not-so-good times.

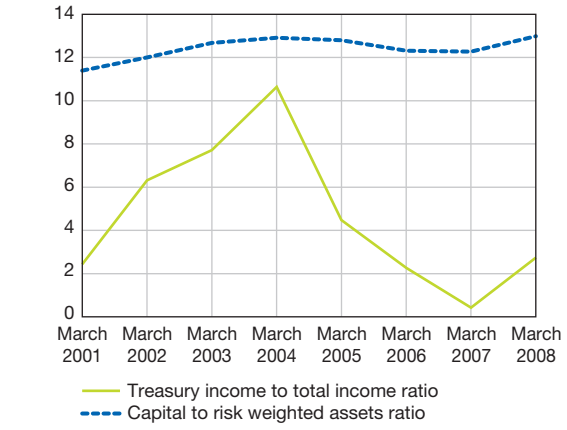
Charts 1
Impact of investment fluctuation reserve (IFR)

a) IFR and profits



Note: IFR amounts for years 2003 and 2004 are approximate estimations.

b) IFR and capital adequacy



Source: RBI.

Time-varying risk weights and provisioning norms

The use of time-varying risk weights and provisioning norms in India were used against a macroeconomic backdrop which provided evidence of disproportionately higher growth to sectors such as housing, commercial real estate (CRE), retail and equity. When the correction set in, in the second half of 2008, some of these measures were relaxed, but tightening measures were re-introduced as growth began to recover.

Table 2
Banks' exposure to commercial real estate

(%)

Date	Risk weight	Provisioning requirements for standard assets
December 2004	100	0.25
July 2005	125	0.25
November 2005	125	0.40
May 2006	150	1.00
January 2007	150	2.00
November 2008	100	0.40
November 2009	100	1.00

Source: RBI.

Table 3
Banks' exposure to retail housing loans

(%)

Date	Risk weight [a]	Provisioning requirements for standard assets
December 2004	75	0.25
November 2005	75	0.40
May 2006	75	1.00
May 2007	50-75	1.00
May 2008	50-100	1.00
November 2008	50-100	0.40

Source: RBI.
a) Risk weights varied according to amount of loan and LTV ratio (Table 3).

Table 4
Differentiated risk weights for housing loans

(%)

Loan amount	LTV[a] ratio (cap of 80% for loan above INR 2 million and 90% for loan up to INR 2 million)	Risk weight
Up to INR 3 million	≤ 75	50
	> 75	100
INR 3 million to INR 7.5 million	≤ 75	75
	> 75	100
INR 7.5 million and above	–	125

Source: RBI.
a) LTV: loan-to-value.

Table 5
Banks' exposure to other retail loans

(%)

Date	Risk weight	Provisioning requirements for standard assets
December 2004	125	0.25
November 2005	125	0.40
May 2006	125	1.00
January 2007	125	2.00
November 2008	125	0.40

Source: RBI.

Table 6
Banks' exposure to the capital markets

(%)

Date	Risk weight	Provisioning requirements for standard assets
December 2004	100	0.25
July 2005	125	0.25
November 2005	125	0.40
May 2006	125	1.00
January 2007	125	2.00
November 2008	125	0.40

Source: RBI.

Table 7
Banks' exposure to NBFCs

(%)

Date	Risk weight	Provisioning requirements for standard assets
December 2004	100	0.25
November 2005	100	0.40
January 2007	125	2.00
November 2008	100	0.40

Source: RBI.

The pre-crisis years of 2004-2008 were a period of high growth and robust capital inflows for the Indian economy, with overall bank credit growing at over 30% per annum. Disaggregated trends, however, revealed that credit growth to certain sectors such as CRE was much higher, exceeding 100% during 2005-2006. The accelerated credit offtake was concomitant with increasing real estate prices. In response, the risk weight for banks' exposure to CRE was increased from 100% to 125% in July 2005, and further to 150% in May 2006. The risk weight on retail housing loans was also increased from 50 to 75% in December 2004. Subsequently, the risk weights on smaller size housing loans (considered as priority sector loans) were reduced from 75 to 50%, while the risk weights on larger loans and those with LTV ratio exceeding 75% were increased to 100%. Simultaneously, as equity prices started rising sharply and there was a boom in consumer credit, risk weights on consumer credit and capital market exposures were increased from 100% to 125%.

The provisions for standard assets were revised upwards in November 2005, May 2006 and January 2007 in certain specific segments as detailed in the tables 5, 6, and 7. The provisioning requirement for other standard advances were, however, kept unchanged, in order to avoid disruption to the flow of credit to the productive and priority sectors.

When the crisis started impacting the domestic financial system and the macroeconomy, RBI responded by relaxing some of the pre-crisis tightening measures in a countercyclical fashion – easing both risk weights and standard asset provisioning norm – again largely following a sectoral approach. The prudential framework for restructuring of advances was also temporarily modified to facilitate viable units facing temporary difficulties tide over the crisis.

By late 2009, credit growth began to recover especially in the CRE segment prompting RBI to once again increase the standard asset provisioning requirements for this sector. Also, a system wide provision coverage ratio of 70% of gross non-performing advances was prescribed with a view to building-up a buffer (surplus of provisions over specific provisions) so that the same could be used by banks for making specific provisions for non-performing assets during periods of downturns. Several other measures, viz. introduction of a cap on LTV ratios and higher risk weights for large housing loans and higher standard asset provisioning for "teaser" housing loans, were introduced in 2010, but the focus of these measures was largely microprudential.

2|2 Policies to address the cross-section dimensions of systemic risks

Dealing with interconnectedness and common exposures

Several measures were taken to address systemic risks arising out of interconnectedness amongst banks, between banks and non-banking financial entities and from common exposures. These measures which have, over time, been built into the prudential framework for the financial sector, *inter alia*, include:

- prudential limits on aggregate interbank liabilities as a proportion of net worth;
- restriction of access to the un-collateralised funding market to banks and primary dealers with prudential caps on lending and borrowing;
- limiting a bank's investment in the capital instruments of another bank/financial institution to 10% of its capital funds and 5% of the investee bank's equity;
- limits on banks' exposure to NBFCs;
- stringent prudential regulations for NBFCs;
- capping banks' investments in liquid schemes of debt-oriented mutual funds as a proportion of net worth;
- restriction on banks' exposure to capital markets to 40% of net worth, on solo and group basis;
- close monitoring of banks' exposures to sensitive sectors;
- limits on overseas borrowings by banks, other than for lending for exports (banks' open foreign exchange position are also subject to prudential caps in relation to capital funds);
- requirements for banks to hold a minimum of 23% of their net demand and time liabilities in the form of liquid domestic sovereign securities (this stipulation has worked both as a solvency as well as a liquidity buffer); and
- not allowing profits on sale of assets under securitisation to be recognised immediately but over the life of the pass through certificates, thereby curtailing the "originate and distribute" model.

Monitoring financial conglomerates

Since 2004, financial conglomerates (FCs) in India have been subject to more intensive supervisory oversight. FCs are entities with significant presence in more than one financial sector segment – banking, insurance, mutual fund, non-banking finance and pension. The supervisory process focusses on management of group-wide risks, intra-group transactions and corporate governance. It relies on offsite surveillance, regular interface with the management of the FC and periodic reviews by a college of supervisors. With the setting-up of the FSDC, an Inter-Regulatory Forum for Monitoring the FCs (IRF-FC) has been set-up. There are prudential regulations for group capital adequacy, exposure limits and intra-group transactions for the bank-led FCs. However, a differentiated prudential framework for FCs was not considered necessary as the financial system in India was (and continues to be) considerably less complex than in most developed markets and most complex, structured, products are either not allowed or are regulated. Recently, RBI has published a draft framework for dealing with domestic systemically important banks (D-SIBs) for comments.

2|3 Framework for the management of the capital account

Capital flow measures (CFM) are generally regarded as tools to regulate/limit capital flows. Post crisis, there is, however, an acknowledgement that such measures are an important part of the macroprudential toolkit especially for emerging markets where capital flows are large relative to their absorptive capacity. The IMF, in a 2012 paper,[1] for instance, says *"to the extent that capital flows are the source of systemic*

1 *See IMF (2012): "The liberalisation and management of capital flows: an institutional view", November.*

financial sector risks, the tools used to address those risks can be seen as both CFM and macroprudential measures." In crisis-like situations, CFMs are often the first line of defence for a jurisdiction.

India's approach to capital account management, both pre and post crisis, as also the measures taken more recently in the wake of exchange rate volatility, reflects the broad underpinnings of systemic risk management. The efforts are aimed at moving beyond addressing only the exchange rate and putting in place a framework which provides sufficient space and instruments for modulating policy to the different characteristics of capital flows, viz. procyclicality and implications for banks, corporates and the sovereign. The salient elements of this framework include:[2]

- an explicitly stated active capital account management framework, based on encouraging non-debt creating and long term capital inflows and discouraging debt flows;

- developing the policy space to use multiple instruments – quantitative limits, price-based and administrative measures, particularly for foreign currency borrowing by corporates;

- short-term debt permitted only for trade transactions;

- avoiding the "original sin" of excessive foreign currency borrowings by domestic entities, particularly the sovereign;

- prudential regulations to prevent excessive dollarisation of balance sheets of financial sector intermediaries, particularly banks;

- cautious approach to liability dollarisation by domestic entities; and

- significant liberalisation of permissible avenues for outward investments for domestic entities.

The approach has been, thus, "strategic"[3] – there is an explicit preference for long-term over short-term flows and equity over debt flows, and both price-based and quantity-based controls have been used to operationalise this policy. Importantly, the key elements of the strategy have been periodically recalibrated to reflect the procyclical impact of lumpy and volatile flows as also in pursuit of greater capital account liberalisation.

Capital account measures taken by RBI in the wake of the announcement of an imminent start to tapering of asset purchase by the Federal Reserve were, however, largely a response to the exchange rate volatility from end May 2013 onwards. These included direct administrative measures aimed at reducing capital outflows and incentivising capital inflows as also measures for tightening liquidity in the domestic markets through the interest rate and the quantity channels. When the adverse spillover of these policies in the domestic markets, particularly debt market, became evident, RBI announced an array of regulatory dispensations to protect the banks' bottom lines – measures which were largely macroprudential in their orientation.

3| Conduct of macroprudential policy in India: some dimensions

3|1 Objectives

The broad objectives of macroprudential policy, especially of the countercyclical policies in India, have been precautionary – to build the resilience of the banking system and to address risks from procyclicality. The objective was clearly spelt out in October 2005 in RBI's policy statement:[4]

"Traditionally, banks' loans and advances portfolio is procyclical and tends to grow faster during an expansionary phase and grows slowly during a recessionary phase. During times of expansion and accelerated credit growth, there is a tendency to underestimate the level of inherent risk and the converse holds good during times of recession. This tendency is not effectively addressed by the prudential specific provisioning requirements for the impaired assets since they capture risk ex post but not ex ante.

2 *See* Gopinath (S.) (2011): "Approach to capital account management – shifting contours", March.
3 *See* Dr. Subbarao (D.) (2011): "India and the global financial crisis what have we learnt?", June.
4 *See* http://rbi.org.in/scripts/NotificationUser.aspx?Id=2539&Mode=0

The various options available for reducing the element of procyclicality including, among others, adoption of objective methodologies for dynamic provisioning requirements, as is being done by a few countries, by estimating the requirements over a business cycle rather than a year on the basis of the riskiness of the assets, establishment of a linkage between the prudential capital requirements and through-the-cycle ratings instead of point-in-time ratings and establishment of a flexible loan-to-value (LTV) ratio requirements where the LTV ratio would be directly related to the movement of asset values."

As evidenced by this statement, the objective of the policy initiatives was not to address asset price bubbles. In fact, there was little concrete evidence of any such bubble given the context of the credit needs of an economy on a high growth path. The objective was also not to curtail overall credit off-take, again in the context of genuine credit needs of a developing economy. The purpose was to prepare the banking sector to effectively manage any potential downside in select sectors. Also, various policy options – including dynamic provisioning, time-varying LTV ratios, capital requirements based on through the cycle ratings, etc. – were considered, with increased risk weights and provisions on standard assets emerging as the preferred policy option.

3|2 Coordination with other policies

There is now a widespread acknowledgement that financial stability is affected by a range of policies. To achieve its goals, therefore, macroprudential policy must be supported by effective microprudential policies and complemented by appropriate monetary, fiscal and other financial sector policies. In turn, macroprudential policy can help these other policies achieve their goals.

There are strong complementarities between macroprudential policy and monetary policy. Measures aimed at strengthening the resilience of the financial system buttress monetary policy by potentially preventing sharp financial disruptions. A stable financial system enhances the effectiveness of monetary policy by facilitating smoother transmission of monetary policy impulses. Conversely, macroeconomic stability could reduce the financial system's vulnerability to procyclical tendencies. Even during times of financial distress, monetary policy can play a crucial role in enhancing the effectiveness of macroprudential policy. This was amply demonstrated by the measures taken by central banks in the wake of the Lehman Brothers bankruptcy and during the sovereign debt crisis.

The Indian experience demonstrates these complementarities. It illustrates a coordinated approach to the conduct of monetary and macroprudential policy to simultaneously pursue price and financial stability. Interest rate measures targeted macroeconomic concerns including inflation and growth even as macroprudential measures aimed at "leaning against the wind" to address risks of procyclicality.

During the upswing of 2004-2008, countercyclical policies such as increasing risk weights and provisions were adopted. Simultaneously, monetary policy was also being tightened. During October 2008 to April 2009, when RBI relaxed its macroprudential measures, it was also aggressively easing its monetary policy. The stance reversed post October 2009, when inflationary pressures warranted monetary tightening while increased credit growth in some segments of the economy necessitated macroprudential tightening.

Table 8
Stance of monetary policy

(basis points)

	Period	Monetary measures	
Tightening	September 2004 – August 2008	Repo rate	300
		Reverse repo rate	125
		Cash reserve ratio	450
Easing	October 2008 – April 2009	Repo rate	-425
		Reverse repo rate	-275
		Cash reserve ratio	-400
Tightening	Post October 2009 – mid-2011	Repo rate	250
		Reverse repo rate	300
		Cash reserve ratio	100

Source: RBI.

3|3 Approach and methodology

• **Focussed on banks.** Given the centrality of the banking system in the country, RBI's macroprudential policy has been focussed on banks. Some measures aimed at addressing the cross-sectional dimensions of systemic risks, however, also encompassed the non-banking financial sector, e.g. prudential limits on banks' exposures to NBFCs and to mutual funds. Also, in the recent past, measures taken in view of a sharp increase in gold prices and accelerated flow of credit against gold included NBFCs.

• **Sectoral approach.** The approach adopted for countercyclical policies was sector oriented. This approach could be attributed to two related constructs. One, while there was a degree of exuberance in the economy during the high growth phase of 2004-2008, credit growth was disproportionately higher in some specific sectors. Two, in a growing economy like India, use of a blunt instrument like interest rates could have resulted in affecting the flow of credit to productive sectors.

• **Metrics for the conduct of macroprudential policy.** The conduct of macroprudential policy was heavily reliant on policy judgement with empirical and anecdotal evidence being used to confirm judgement. RBI did not have any disaggregated statistical data or model to support its concerns on the risks of rising bank exposures to certain specific sectors. For instance, in the specific case of the CRE sector, policy judgement was based on trends in aggregate bank credit and credit to the sector; evidence from onsite inspections of banks about weaknesses in underwriting standards, emerging signs of under-pricing of risks; emerging trend of mortgages for second "homes"; anecdotal evidence about the inventory build-up; and a visibly steep increase in land prices.

• **Tools.** The tools used for countercyclical policy, viz. risk weights and provisioning, were largely tools of microprudential policy. Indeed, many of the policy measures initiated by RBI served a microprudential as well as a macroprudential purpose. RBI, in its conduct of macroprudential policy heavily drew upon its role as supervisor of banks for supervisory information, judgement and risk assessment. This approach reflects the post-crisis wisdom about the strong complementarities between microprudential supervision and macroprudential policy.

3|4 Effectiveness

An assessment of the impact of countercyclical policies is not straightforward as credit growth, including credit growth to specific sectors, is affected by a host of factors of which monetary policy and macroeconomic performance are predominant. Given that the stance of macroprudential policy in India complemented the stance of the monetary policy, a complete isolation of the impact of the respective policies may not be possible. However, some general observations in this regard could be made.

First, there is evidence that the policy tightening was able to dampen the exuberant credit growth in the targeted sectors. In particular, the flow of credit to CRE decelerated from over 150% (year-on-year) in 2005 to below 50% in 2008. During the same period, growth rate in total bank credit also decelerated (from about 30% to 23%) indicating, at least partially, the impact of monetary policy tightening.

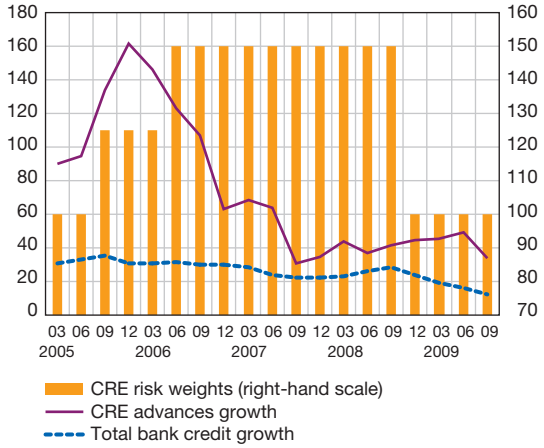
Second, the effectiveness of countercyclical policies during downturns is less evident. In fact, credit growth slowed down considerably especially during late 2008 and early 2009 notwithstanding relaxations in monetary and macroprudential policy. The deceleration in credit growth was evidenced in total bank credit and also flow of credit to the specific sectors for which risk weights/provisioning norms were relaxed.

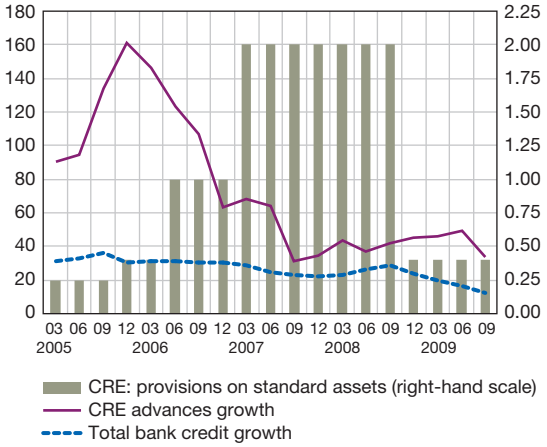
The asymmetric effectiveness of macroprudential policy measures during "good" and "bad" times could also partially be attributed to the effectiveness of the "signalling" effect of policy. During the tightening phase, a strong message was sent out about the central bank's concern with the pace of credit growth to certain specific sectors. This could arguably have made the banks more cautious in lending to these sectors. During the easing phase, however, the signalling effect became less effective due to subdued credit demand and risk aversion amongst banks.

Charts 2
Effectiveness of macroprudential measures

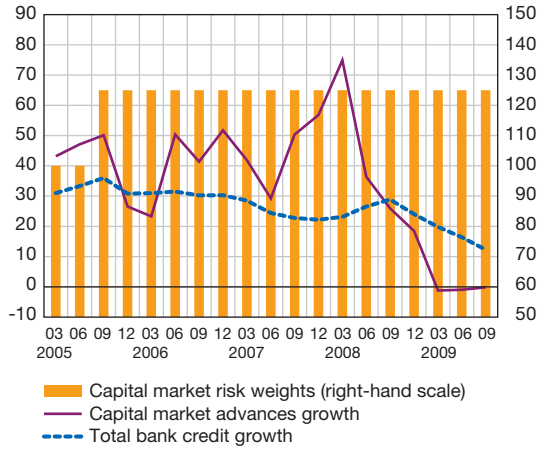
(%)

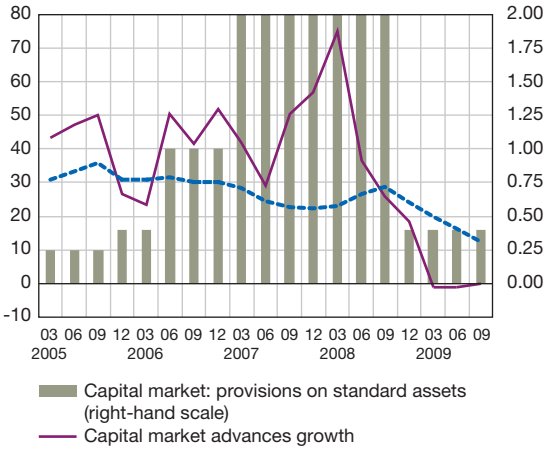
a) Credit to CRE



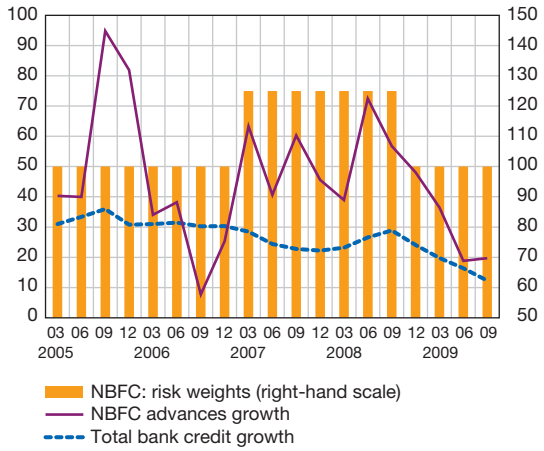


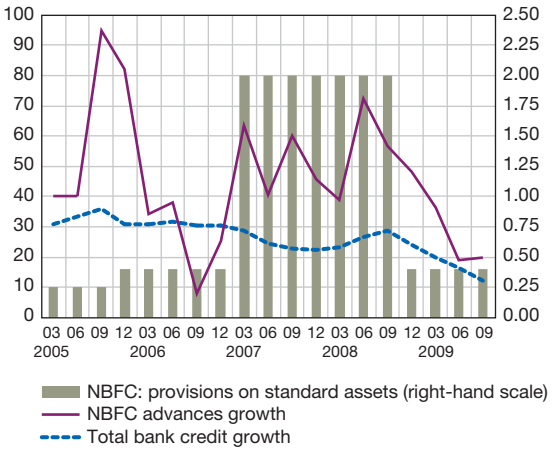
b) Capital market exposures





c) Credit to NBFCs





Source: RBI.

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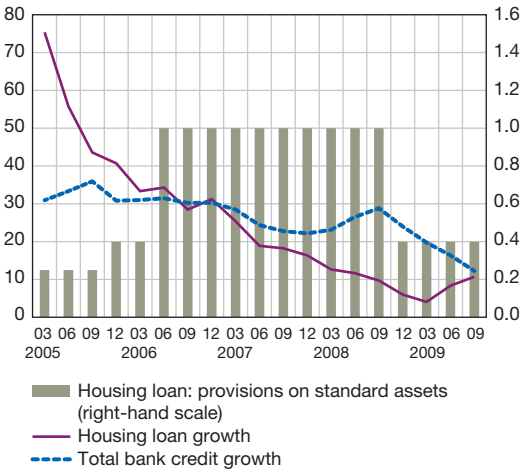
Charts 2 (cont'd)
Effectiveness of macroprudential measures

(%)

d) Housing loans



Source: RBI.

4| Challenges going forward

4|1 Developing an analytical framework for systemic risk assessment

RBI's experience with macroprudential oversight has been largely based on policy judgement. It is now clear that an effective and formal framework for macroprudential oversight requires both analytical sophistication and good judgement. Policy makers need to be able to assess the nature and extent of risk and be able to make informed judgement on when macroprudential polices should be activated and which tools should be used. RBI has been making efforts to develop an analytical framework for the assessment of systemic risks in recent years (see Box).

Box

Framework for systemic risk assessment

A number of initiatives have been taken to improve the financial stability analytics in RBI. Some of these are outlined below.

Stability indicators and maps

Stability indicators and maps represent coincident indicators of systemic stress in the financial system. They are constructed by aggregating information from different segments of the overall financial system and encapsulating the information in a single statistic which measures the current state of instability in the financial system.

RBI has been using a variety of stability maps and indicators to assess trends in risk dimensions of various aspects of the macrofinancial system – the banking sector, the macroeconomy, financial markets, the corporate sector, etc. Each of these indicators is based on contemporaneous developments in different risk factors. A systemic liquidity indicator has also been developed to gauge the degree of stress in domestic liquidity conditions and to establish time frames for potential extreme events.

Banking stability measures and expected shortfall

Banking stability measures, a cross-sectional econometric framework, capture the distress dependencies among financial firms using stock price data and attempt to estimate the contribution of individual firms to systemic risk. A banking stability index is calculated, which captures the expected number of banks to become distressed given that at least one bank has become distressed. Separate toxicity and vulnerability indices capture distress between specific institutions while the cascade effect attempts to measure the distress in the system associated with the distress of a specific institutions. This method is also being used for estimation of expected shortfall of assets of banking system in response to a large negative shock.

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Network analysis

The techniques of network modelling have been used to develop a bespoke financial network analysis and contagion stress testing platform for the Indian financial system. The analysis primarily looks into the interconnections that exists between different institutions in the financial system and tries to identify the build-up of systemic risks. Graphical network representations have been developed which are being used to assess the degree of system level interconnectedness and the stability of the system. A contagion simulator helps in assessing the possible loss of capital to the financial system due to a random failure of one or more financial institutions. Both the solvency and liquidity effects of failure of a financial entity are assessed.

Macrofinancial stress tests

RBI conducts a variety of macro stress testing exercises at regular periodicities. The first set of stress testing exercises uses multivariate regression tools to evaluate the impact of a particular macroeconomic variable on the asset quality of banks and their capital adequacy ratio at the system level. The second set is based on a vector autoregressive (VAR) model which assesses the impact of the overall economic stress situation on the asset quality and capital adequacy of the banking system taking into account the feedback effect of the macroeconomic performance of the economy on banks' stability. The third set uses quantile regression techniques to model system level slippage ratio with macrovariables in the tails. Multivariate regressions and panel regressions are also used for projections/stress testing for various sector as well as at bank group level.

In order to improve the assessment of projected NPAs on the capital, a model based on time series econometric tool has been developed to project profit of banks under different macroeconomic scenarios. The projected values of the ratio of the non-performing advances are translated into capital ratios using the "balance sheet approach", by which capital in the balance sheet is affected via the provisions and net profits.

There are, however, clear challenges in developing a robust analytical framework for conduct of macroprudential policy. Putting in place an assessment infrastructure which is capable of raising "red flags", i.e. signalling trends that could make markets or countries vulnerable to unanticipated events is far from straightforward given that systemic risks *per se* are generally complex, very often opaque, and always multifaceted. In fact, there is no universally accepted definition of systemic risk, adding to which there are major gaps in the availability of data at both the national and international level to ensure that the build-up of risks is recognised and addressed in a timely manner. Regulatory judgements will thus continue to play a critical role in informing decisions about macroprudential policy with associated risks of both type I and type II errors – imposing buffers too early out of excessive caution or delaying imposition of buffers till it is too late to avert an implosion – which can be costly in macroeconomic terms.

4|2 Managing risks arising out of corporate leverage and un-hedged foreign exchange exposures of corporates

Post crisis, especially in an environment of low interest rates and abundant global liquidity, corporate leverage has gone-up substantially even while the banking system leverage has been curtailed due to the regulatory reforms. A study of ten large corporate groups in India by Credit Suisse has revealed that the share of these ten groups in total banking sector credit more than doubled between 2007 and 2013 even while the overall debt of these groups rose six times (from under INR one trillion to over INR six trillion). Similarly, the lure of cheap foreign funds also enticed several corporates to borrow large sums of monies abroad without adequately hedging their exposures. While the banks' proprietary exposure to the forex market operations is capped by regulations, the same is not true for the corporates' forex exposures.

In fact, the volatile capital flows in India and probably across the emerging markets have led to building-up of significant amount of stress on the corporates' balance sheet due to these un-hedged currency exposures. The burgeoning leverage and the un-hedged currency exposures of the corporates have created implications for the banking system in the form of increased credit risk. To some extent, this is already evident in India due to manifestation of these risks in few corporate entities and the consequential impact on the balance sheets of the banking sector. As systemic risk primarily emanates from increased credit risk in the banks' books, it is important for the regulators to find ways to limit the leverage and the extent of overseas borrowings. Going forward, macroprudential policy may need to explore the possibility of prescribing that greater weightage is given to the capital/leverage of corporates in the credit appraisal of banks. Alternately, differentiated risk weights/higher provisioning for such exposures as well. In any case, this is an area which warrants further work at the global policy making level.

4|3 Policy coordination

The importance of policy coordination is critical for the success of macroprudential policy. This article has earlier discussed that the coordinated monetary policy and countercyclical measures contributed to the effectiveness of both sets of policies in the pre-crisis exuberance phase in India. It is not difficult, however, to conceive of situations where the policy stance and objectives conflict. Indeed, the seeds of the financial crisis were sown in a period of monetary stability and low interest rates. There are clearly challenges associated with ensuring some degree of coordination between monetary and macroprudential policies, while ensuring the independence and credibility of monetary policy. These challenges could be further accentuated in emerging markets like India where monetary policy often needs to factor in considerations of growth and development.

Again, it is difficult to make a binary distinction between microprudential and macroprudential policies. Incorporating a systemic perspective in microprudential policies could, for example, be easier in boom times when buffers are required to be built-up. During "bad" times, there could be tensions as the macroperspective could call for relaxations in policy (e.g. release of buffers), while the microperspective may favour retaining the buffers.

In the Indian case, so far, these conflicts have been resolved as RBI is the monetary authority, regulator and supervisor of the banking system and also the implicit systemic regulator. Going forward, however, as the financial system becomes more complex and macroprudential considerations have to factor in various sectors of the economy, challenges may emerge and strong coordination between the regulators and with the government will be called for.

4|4 Macroprudential policies in "good" times and in "bad" times

One major challenge of macroprudential policy is the strong resistance to countercyclical policies during "good" times. The difficulties are compounded by the fact that it would be difficult to put in place a rule based approach to macroprudential policy. Systemic risk assessment remains an inexact science with considerable scope for missing signals and false alarms, which makes it difficult to spur concrete policy action especially as such actions often involve taking away the proverbial punch bowl just as the party is going strong.

In "bad" times, implementation of macroprudential policies may be relatively easier in the context of the political economy, but, as the Indian experience has shown, ensuring the effectiveness of policies during busts/slowdowns presents its own sets of difficulties. It is much easier for a regulator to stop a bank from lending than for it to induce the bank to lend! Similarly, it is arguably easier to control capital inflows during booms than to persuade international investors to bring in flows during busts.

5| Concluding remarks

The article has outlined the experiences and perspectives of RBI in implementing macroprudential policy in India. The experience so far has been enriching but the road ahead is very challenging. Macroprudential policy has its own limitations, especially in emerging markets. There are risks of macroprudential policy being over-applied – they are

not a panacea for all evils nor a sure shot recipe for financial stability. There are also risks of making macroprudential policy too narrow in focus.

It would be important for policy makers to clearly understand what macroprudential policy can do and what it cannot do. For example, it would be unrealistic to expect macroprudential policy to successfully affect aggregate demand in the economy or influence economic cycles. Again, macroprudential policy cannot directly address asset price bubbles. It can, at most, enable the economy and the financial sector to weather the impact of a disorderly fall in asset prices. The experience in India so far suggests that macroprudential policy is best suited to improving the resilience of financial institutions to shocks.

In emerging markets, the implementation of macroprudential policy will need to additionally factor in the risk of stifling growth potential. A general trend of high credit growth may not, by itself, be a matter of systemic concern in an emerging market. A case in point is the calibration of the countercyclical capital buffer (CCB). The BIS has suggested the use of credit-to-GDP as the primary metric. However, as enunciated in the draft framework for operationalising the buffer published by RBI, while the credit-to-GDP gap will be used for empirical analysis to facilitate CCB decision for banks in India, it may not be the only reference point and may be used in conjunction with other indicators.

As discussed earlier in the article, macroprudential regulation is essentially an inexact science. Development of the framework for implementation of macroprudential policy is still work in progress. Moreover, the policy has its own limitations and needs to be used in conjunction with other policies to be effective.